Proceedings of
AFLA 7

The Seventh Meeting of the Austronesian Formal
Linguistics Association

Edited by
Marian Klamer

Vrije Universiteit Amsterdam
Department of Linguistics
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Preface

This volume consists of papers presented at the seventh meeting of AFLA (Austronesian Formal Linguistics Association), held at the Vrije Universiteit on May 11-13, 2000.

For the first time in the history of AFLA, this meeting was held outside the North-American continent, and contained contributions by speakers from eleven different countries: New Zealand, Australia, Indonesia, Brunei Darussalam, Taiwan, the USA including Hawaii, Canada, the UK, France, Germany, and The Netherlands.

Apart from the languages that are traditionally well-represented at Austronesian conferences, we were happy to see that the program also contained work on relatively small or lesser described languages, such as the minority languages of Taiwan, North-West Borneo, Eastern Indonesia, Papua and Oceania.

Special themes of this conference were Iconicity and Argument marking. The papers in this volume show that the program covered a broad range of subdisciplines -- from discourse grammar, phonology, morphology, syntax, to semantics -- and that the authors are working within various theoretical frameworks. But despite the obvious differences in expertise, interest and background, the atmosphere on the conference was typically AFLA: lively and constructive, with an average rate of attendance of about 80%. The papers in this volume deserve the same rate of attention.

This meeting has again furthered the unwritten mandate of AFLA to encourage the formal study of Austronesian languages, especially work by speaker linguists and junior scholars. Six scholars presented analyses of their native language, and more than half of the 45 participants subscribed as 'student'. This suggests that the future of Austronesian linguistics looks very bright indeed.

The eight edition of Afla will be held in the spring of 2001 at the Massachussetts Institute of Technology (MIT) in Boston, USA. The principal organiser will be Ileana Paul.

Marian Klamer, Vrije Universiteit Amsterdam

Proceedings of previous AFLA meetings:

A Selection of the papers of AFLA 2, in 1995 is published as:
Paul, Ileana, Vivianne Phillips, and Lisa Travis (eds.). 2000. *Formal Issues in Austronesian Linguistics*. Dordrecht, Kluwer.

The proceedings of AFLA 3 and AFLA 4 in 1996/1997 are published as:
Pearson, Mathew (ed.). 1998. *Recent papers in Austronesian Linguistics*. UCLA Working Papers in Linguistics 21.

The proceedings of AFLA 6 in 1999 are published as:
Smallwood, Carolyn and Catherine Kitto (eds.). 2000. *Proceedings of AFLA VI*. Toronto Working Papers in Linguistics.

Table of Contents

Nominalisation of verbal clauses in Marquesan
(Oceanic, French Polynesia)

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1. Introduction

The present paper examines the nominalisation of verbal clauses (henceforth: NVC) in Northwest Marquesan[1] (henceforth: N-MQA, or just Marquesan), an Eastern Oceanic language of the Proto-Eastern Polynesian subgroup spoken in the North-Western part of the Marquesan archipelago in French Polynesia.

With respect to nominalisations, languages of the world differ as to whether nominalisations are more closely related to the syntax of noun phrases or to the syntax of verb phrases. This was suggested by Comrie & Thompson (1985). My paper also addresses the question whether nominalisations in N-MQA show more characteristics of noun phrase syntax or more characteristics of verb phrase syntax.

2. Why do I call nominalisations in N-MQA 'Nominalisation of verbal clauses'?

The type of nominalisations I am interested in are event- and proposition-denoting nominalisations. In many languages of the world these kinds of nominalisations are not purely nominal, i.e. they do not have all the syntactic properties which non-derived noun phrases such as Engl. 'the dog', 'the house' etc. have.

In N-MQA nominalisations are not derived by morphological means such as Engl. 'performance' from 'perform'. All verbal clauses in Marquesan can be nominalised without changing the form of the word functioning as the lexical head of the verbal clause.

All words which function as the lexical head of a verbal clause can also function as the lexical head of a nominalised verbal clause. Nominalisations do not derive nouns from verbs, but they transform verbal clauses into noun phrases.

At this point it is important to emphazise that nominalisations in Marquesan are syntactically derived whereas event-denoting nominalisations such as Engl. 'performance' are lexical nominalisations which are derived by specific morphological means.

Following Comrie & Thompson (1985) I will examine the following questions concerning NVCs in Marquesan:

1) **What are the morpho-syntactic processes of deriving NVCs?**
2) **How many verbal and nominal properties does the lexical head of a NVC show?**
3) **How are arguments expressed in NVCs?**
4) **Do NVCs occur more with nominal or more with verbal modifiers?**

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[1] The data presented here was collected on the islands of 'Ua Pou and Nuku Hiva.

NVCs in Marquesan show characteristics of NPs as well as verbal clauses, i.e. they occupy an intermediate position between being purely nominal and purely verbal. However, the categorisation into verbs and nouns is problematic in Marquesan. Words cannot easily be classified as belonging to one particular word class such as nouns or verbs because the same form of a word can appear in several different syntactic environments such as verbal, nominal or as lexical modifiers. Therefore it is not possible to distinguish formally between the head of an NP, VP or NVC. The best way out of this problem is to define a word on the basis of its morphosyntactic properties within a particular syntactic environment. So their actual use in a particular syntactic environment classifies words as verbals, nominals or lexical modifiers.

NVCs in Marquesan are interesting to examine because they seem to be a salient feature of Marquesan grammar. About 23 % of all sentential units[2] I examined contained at least one nominalisation. Moreover, the fact that we have syntactic nominalisation in Marquesan is a reflection of the multifunctionality of words and the difficulty in categorising them into nouns and verbs. One of the aims of this paper is to demonstrate that there seems to be no clear boundaries of what nominal or verbal in Marquesan really is.

Before I turn to nominalisations in N-MQA in more detail, I would like to give some information on the basic features of N-MQA.

3. Features of N-MQA

N-MQA is an accusative case-marking language with case being marked by prepositions. Common noun phrases are marked by articles whereas verb phrases are marked for tense, aspect and mood by verbal particles (short: TAM-particles). The basic constituent order is V-S-O:

(1) 'u   kanea Teiki i   t=a   ia   ha'e
   TAM build   T.   DO ART=POSS 3.sg house
Teiki has built his house.

3.1 Noun phrases: expression of arguments

The absence or presence of prepositions indicates the syntactic function of a noun phrase. Subject NPs are unmarked NPs, whereas direct object NPs are marked by the preposition i (see (1)).
Oblique NPs expressing cause, instrument and recipient are also preceded by the preposition i:

(2) 'ua   motu tu'u   kahu 'i='ima   i   te   ke'a (DD)
   TAM cut   POSS.Pr.1.sg cothes RED-ahand/arm OBL ART stone
My sleeves were cut by/with the stone (lit.'... caused by the stone')

---

[2] About 1500 sentential units of narratives were examined.

3.2 Verbal classes

Words which function as the lexical head of a verbal clause are classified on the basis of their valency. N-MQA has three major verbal classes, namely **transitive**, **intransitive** (action (e.g. he'e "go"), process (e.g. topa "fall") , state (e.g. kanahau "nice")) and **neuter** verbals.

transitive verbal clause
(3) e   koti a'a   Teiki   i   te   vehie   me te   toki... (CH-B-005)
     TAM cut Dem T.   DO ART fire.wood with ART axe
     Teiki is cutting the fire wood with an axe.

intransitive verbal clause
(4) e   'ori   te   tau   vehine ... (K1B-T5:19)
     TAM dance ART PL   woman
     The women are dancing...

Neuter verbals
The class of neuter verbals is a small class of intransitive action verbals which take the undergoer as their subject and optionally an agent as an oblique argument (see also (2)):

(5) 'a'o'e   i   *hemo*   te   kamo i=a='u. (DD)
    be.not TAM catch/caught   ART thief OBL=ART.ps=1.sg
    I did not catch the thief/ The thief was not caught by me.

4. Nominalised Verbal Clauses in N-MQA

Keeping these features of Marquesan in mind I will now turn to the four leading questions asked in the beginning.

4.1 What are the (morpho-syntactic) processes of forming NVCs?

Any verbal clause can be nominalised without morphological changes of the lexical head by simply replacing the TAM-marker by the general article te:

Verbal clause
(6a) **e   popahi** ia i   t=a   ia puke manu:... (Mak-017)
      TAM command 3.sg DO ART=POSS 3.sg pile bird
      He commanded his birds:...
Nominalised verbal clause
(6b) me **te   popahi** o   Pa'etini i   t=o   ia tau po'i... (Mak-026)
     and ART command POSS P.   DO ART=POSS 3.sg PL people
     And Pa'etini's commanding of his people...

According to some researchers (Chung 1973; Clark 1981) Polynesian languages have a nominalising suffix which goes back to PPN *-Canga. In N-MQA this suffix -'ia often occurs in nominalisations, but its primary function is not to nominalise verbal clauses, but

to mark an aspectual distinction between perfective vs. imperfective aspect (see also Mosel (1992:277) for Samoan). I will discuss this below (see §4.2.1.1).

4.2 Verbal and nominal properties of NVCs

In order to decide whether NVCs in N-MQA are more closely related to the syntax of noun phrases or to the syntax of verbal clauses, it is crucial to determine the verbal and nominal properties of NVCs. This also includes the expression of arguments in NVCs.

Typical nominal features in N-MQA are the marking of **case**, **definiteness** and occasionally **number** in NPs and their occurrence in a number of syntactic positions such as subject, object or oblique position. Further nominal characteristics of NPs are the modification by genitive attributes, by relative clauses and by a class of state verbals (e.g. kanahau "be nice", rui "be big", po'otu "be beautiful").

Typical verbal features are the marking of tense, aspect and mood, voice, negation and occasionally number agreement on the verb. Moreover, the expression of subjects and objects in NVCs can also tell us something about the more verbal or more nominal nature of NVCs. If the subject and object of the corresponding verbal clause are expressed in the same way as in NVCs we have evidence for the more verbal character of NVCs. However, if subject and object appear as nominal attributes we have evidence for the more nominal nature of NVCs. I will begin with the verbal properties.

4.2.1 Verbal categories

4.2.1.1 Tense, aspect and mood

NVCs in Marquesan lack tense and mood marking, but they have the linguistic means of marking perfective aspect by using the suffix -'ia (which I briefly mentioned above). According to Clark (1981) 'the suffix is often determined by its larger syntactic context' in which the nominalisation appears. It is true that the suffix occurs in certain syntactic constructions such as in temporal adverbial phrases expressing punctual aspect, or with numerals. It is probably no surprise that these NVCs occur with the suffix -'ia because they refer to bounded, individual and countable events. Therefore I believe that the suffix' main function is to mark an aspectual distinction. Where the suffix -'ia occurs the situation is seen as a whole or the event is regarded as being completed as e.g. in (7) and (8):

(7) 'u ko'ana 'atou i te pokoki a te po'i o Taipi
    Perf find 3.pl DO ART capture POSSART people POSST.
    me te kai='ia atu (Hak-16)
    and ART eat=Perf DIR.temp
    The people of Taipi were able to capture them and later ate them up.

(8) mea 'oa te ha'apeipei='ia a te po'i 'i te=ia 'aa
    STV-P long ART CAUS=prepare=Perf POSS ART people LD ART=Dem day
    'i te=ia 'aa i te tau himene me te tau haka... (Kim-2)
    LD ART=Dem day DO ART PL song and ART PL dance
    The people's preparation of songs and dances each day was long...

NVCs which lack the suffix -'ia often have an habitual or imperfective reading as in (9):

(9) 'ua kave mai na   'enana 'i   te   vaka,
   Perf carry hither ART.PL man   LD   ART canoe
   'i   'ei'a te   **ha'a=moe** 'a   i   te   nino .... (Hak-20)
   LD ANA ART CAUS=lie   EMPH DO ART body
   The two men carried (him) to the canoe; there was **the laying out** of the body....

The following two contrasting examples with t̲i̲h̲e̲ "arrive", illustrate that the suffix -'ia triggers a perfective reading (see (10)), whereas the lack of the suffix -'ia triggers an imperfective reading (see (11)):

(10) **'i   te   tihe='ia**   'i'a 'u   pe'au Pa'etini... (Mak-014)
    LD ART arrive=Perf   there Perf say   P.
    When (he) arrived there, Pa'etini said.... (lit. 'at the arrival there Pa'tini said')

(11) epo te   **tihe** o   te   **oumati**, 'omua Teatau'apaku 'i   te   t̲i̲h̲e̲. (E-123)
    later ART arrive POSS ART sun   before T.   LD   ART arrive
    The arriving of the sun is later, first Teatau'apaku is arriving.

The contrast between the usage of the suffix -'ia and the lack of the suffix -'ia in NVCs is probably best demonstrated by an example in the same linguistic context. The following two examples are taken from a legend in which a guardian of the chief Uhutete is listing to the talk of an imprisoned boy:

(12) he   mea hemopu='ia ia **te   ha'a=hiti** a   i   te   ikoa o
    ART   thing tear.apart=PASS 3.sg ART CAUS=go.up EMPH DO ART name POSS
    Tahiatemata i   mate te   tuehine o   te   haka'iki o   Taipi 'o
    T.   TAM dead ART sister POSS ART chief   POSS T.   PRES
    Uhutete. (Hak-18)
    U.
    The thing that tore him apart was the uttering of Tahiatemata's name who is
    dead, the sister of the Taipi chief, who is called Uhutete.

In (12) the situation is viewed from within and we do not really know how often the boy utters the name of his mother, probably repeatedly. However, the guardian goes back to his chief and tells him about the boy's uttering the name of the chief's sister. Now, the situation is seen as a whole and thus h̲a̲'a̲h̲i̲t̲i̲ "utter", the lexical head of the NVC, is suffix by -'ia[3]:

(13) " 'ua 'oko au i   te   maha'i i   **te   ha'ahiti='ia** i   te   ikoa
     Perf hear 1.sg DO ART boy   OBL ART CAUS=Perf   DO ART name
     ma   te   pe'au o   t=o   ia   kui 'o   Tahiatemata". (Hak-18)
     with ART say   POSS ART=POSS 3.sg mother PRES T.
     "I heard the boy who uttered a name by saying his mother's name which is
     Tahiatemata.

The occurrence and non-occurrence of the suffix -'ia in NVCs of N-MQA is a retention of the verbal category of perfective aspect and not simply a nominalising suffix as often claimed in the literature on Polynesian languages.
Other verbal categories are voice, negation and number agreement.

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[3] The report of the guardian is in direct speech.

4.2.1.2 Voice

Transitive verbs are also passivized by the suffix -'ia. The optional expression of the agent is introduced by the preposition e in passivized verbal clauses as well as in NVCs:

Passivized verbal clause
(14a) 'u   humu='ia   te   puaka e   Teiki (E)
   Perf attach=PASS ART pig   AGS T.
   The pig was attached by Teiki.
Passivized NVC
(14b) te   humu'ia   o   te   puaka e   Teiki (E)
   ART attach=PASS POSS ART pig   AGS T.
   the attachment of the pig by Teiki

The expression of the agent by an e-phrase is in fact evidence for the retention of verbal syntax.

4.2.1.3 Negation

In Marquesan verbal **negation** is not expressed by particles but by verbs which function as the matrix verb of a clause:

(15)**'A'o'e** 'aua i   kite ena me te   'enana ma   'oto. (Lav-U:049)
   be not 2.dl TAM know exist with ART man   Prep inside.
   They do not know that there are men inside.

In nominal constituents, the nominal can be negated by the postpositioned particle ko'e "without, cease":

(16) 'io   **te henua**   **'enana ko'e**
   Prep.loc ART country   man   without
   in the desert (lit. 'in the land without men')
In NVCs the head is negated in the same way as in nominal constituents:

(17)'ua he'e Hi'imoana 'i Nuku Hiva me **te vivini ko'e** o   ia,
   Perf go H.   LD N. H.   and ART understand Neg   POSS 3.sg
   'o   te   'ite='ia paona te=nei o   ia i t=a   ia 'ona vehine.
   PRES ART see=Perf final ART=Dem POSS 3.sg DO ART=POSS 3.sg dear wife
   Hi'imoana went to Nuku Hiva without understanding that this is the last time
   he has seen his wife. (Hak-22)

The use of nominal negation in NVCs of Marquesan shows, in fact, the more nominal character of NVCs. However, the reason for nominal negation in NVCs might be due to the fact that verbs of negation cannot be nominalised.

4.2.1.4 Number agreement

Verbs occasionally, but not obligatorily show number agreement on the verb. If the subject has more than one referent, the verb is partially reduplicated as in (18). This is also sometimes retained in nominalisations as in (19):

(18) 'u **he-he'e** hua mou pakahio   ma he   one... (U-019)
    Perf RED-go ART PL   old.woman Prep ART sand.beach
    The old women went along the beach.

(19) Ena 'io he mata'ae **te**   **no-noho** o   te=na   mou maha'i. (T/H-210)
    exist Prep ART land's.end ART   RED-stay POSS ART=Dem PL   boy
    The boys are staying at land's end. (lit. 'there is at land's end the staying of the two boys')

4.2.2 Nominal categories

4.2.2.1 Syntactic positions in a clause

A good argument for the noun phrase status of NVCs is that they occur in a number of syntactic position in which non-derived NPs can occur. They occur in subject, object and oblique positions of a clause (see examples (20-23)):

Subject in verbal clauses

(20)'u hakaea te **piki a**   **hua maha'i i**   **te vehine**. (T/H:349)
    Perf stop   ART climb POSSsame boy   DO ART woman
    It stopped the making love of the boy to the woman.

Subject in nominal clauses

(21)'ua rere hua vehine; 'io   he   tai **te ka'o'ia**   **atu**.
    Perf flee ART woman Prep.loc ART sea ART disappear=Perf thither
    That woman flew; **the disappearing** was on sea.

Object

(22)'U pe'au haka'ua hua   vehine Perf say   again   ART.ana woman
    " Po'iti, 'ua have koe **i** **te kutu i te**   **upoko**?" (T/H:331)
    P.   Perf know2.sg DO ART delouse DO ART head
    That woman said again: " Po'iti, do you know how to delouse the head?"
    (lit. '... do you know the delousing of the head')

Oblique

(23)Atahi 'a   hemo ai   te tuehine i   te   mate koea
    then   TAM catch ANA ART sister   DO ART illness crazy
    i **te** **ue i** **t=o**   **ia** **tukane i**   **mate nei 'o** **Teatau'apaku**
    OBL ART cry OBL ART=POSS   3.sg brother TAM dead just Pres T.
    Then the sister became mad caused by the crying over her brother's recent death who was called Teatau'apaku. (E-122)

The examples above illustrate that NVCs behave syntactically like NPs because they are marked by case and occur in syntactic positions in which other non-derived NPs occur. Other nominal features are the marking of number and definiteness.

4.2.2.2 Number

N-MQA has a number of plural markers which precede the lexical head of an NP. NVCs cannot be marked for plurality by these plural markers. Compare (24a) and (24b):

(24a) me **te**   **popahi** o   Pa'etini i t=o   ia tau po'i...
    and ART command POSS P.   DO ART=POSS 3.sg PL people
    And Pa'etini's commanding of his people... (Mak-026)

(24b) *me te   **tau popahi** o   Pa'etini... (E)
    and ART PL command POSS P.

However, in Marquesan NVCs can occur with numerals when the events denoted by the nominalisation signal several individual and countable events:

(25) **e   to'u kanea='ia**   i   te   **vaka**....
    Num three construct=Perf   DO   ART canoe
    Three constructions of a canoe (=a canoe (unspec.) was constructed three times)

When NVCs occur with numerals, the numeral replaces the article. Moreover, the head of the NVC is suffixed by -'ia because it refers to individual bounded events.

As for definiteness of NVCs, I could only observe that the general article te was used in the overwhelming majority of occurrences. The article te neither marks an NP for definiteness nor for specificity. The article te is a kind of *default*-article which is used when all other articles are less appropriate. Therefore we can say that definiteness is weakly specified in NVCs and that the main function of the article te is to syntactically derive NVCs from verbal clauses.

4.3 The expression of arguments in NVCs

The most interesting evidence for the more verbal or more nominal character of NVCs is the examination of how arguments are expressed. According to Comrie & Thompson (1985) the expression of oblique objects and adjuncts is less interesting because there seems to be little variation across languages. Oblique objects and adjuncts do not normally undergo a transformation, i.e. they occur in the same form as in the verbal clause. This is also true for Marquesan.

In Marquesan the expression of subjects and objects show nominal as well as verbal features.

4.3.1 Expression of subjects in NVCs

Subjects are expressed as genitive attributes and therefore assimilate to NP syntax. The genitive attribute mostly occurs in postnuclear position, but when subjects are pronominalised, they can occur in pre- and postnuclear position:

Possessive attribute in prenuclear position
(26) 'i   t=**o**   **ia**   tihe='ia   'i   Hakamou'ui.... (Mak-14)
     LD   ART=POSS 3.sg   arrive=Perf LD   H.
     At his arrival/arriving in Hakamou'ui....

The genitive attribute need not follow the head of NVC directly. In (27) the direct object is closer to the nominalised lexical head than the genitive attribute:

(27) atahi 'a   oko   nui ai te 'i'i
     when TAM   strengthen very ANA ART strength
     te   ha'aha'a atu ia ia   o   te   Hiva 'Oa.... (H-012)
     ART be.angry   DIR DO 3.SG POSS ART H.   O.
     When they had strengthened the forces, the enraging of the Hiva 'Oa against him...

Polynesian languages often make a distinction between inalienable and alienable possessive relationships. Alienable relations are expressed by a̲, inalienable by o̲.
The o̲/a̲-distinction is partly maintained in NVCs. Subjects of transitive verbs often have an agentive role in the action expressed by the verb and therefore are often marked by a̲ in the NVC:

(28a) ...e   he'e au 'u tihe mai nei 'a   te   vava'o[4] **a**   **te   hei**
      TAM go 1.sg Perf arrive hither now EMPH ART   call POSS.al ART garland
      I am going because **the garland's** calling has reached me now.

However, not all subjects of transitive clauses are explicitly agentive and thus are marked by o̲:

(28b) 'ua 'oko='ia   te   veva'o **o**   **te   tau pahu me te   po'i haka**. (Hak-30)
      Perf hear=PASS ART call   POSS ART PL drum and ART people dance
      The calling of the drums and the dancers was heard.

Subjects of intransitive verbal clauses are expressed by an o̲-phrase, although subjects of corresonding intransitive verbal clauses can sometimes express an agentive role (like he'e "go", hiamoe "sleep"):
(29) 'ua ko'e te   peke   **o**   **hua vehine**.... (U-126)
     Perf cease ART be.angry POSS ART woman
     The being angry of the woman was over.

O̲-marking of subjects in NVCs is also consistent with experience verbals, neuter verbals and state verbals.
We can therefore conclude that the distinction of inalienable and alienable possessive marking in subjects of NVCs is dependent on semantic as well as syntactic factors. For

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[4] The missing of the direct object in the NVC might question whether vava'o "call" is really transitive. However, in the same legend vava'o "call" is clearly used transitively in verbal clauses:
e.g. e   vava'o nei   te   hei   ia   au (T/H-063)
     TAM call   now ART garland DO 1.sg
     The garland is calling me now.

nominalised transitive verbals the choice is semantically determined, whereas for nominalised intransitive verbals the choice is syntactically motivated.

All subjects in NVCs are expressed as a genitive attribute and therefore clearly show that NVCs have nominal features.

4.3.2 Expressions of objects in NVCs

As for the expression of objects in NVCs, objects are expressed in the same way as in the corresponding verbal clause and therefore have retained verbal syntax. The direct object of transitive clauses always remains in the accusative case in the corresponding NVC regardless of whether the subject is expressed or not:

(30) 'atahi 'a   kite atu   Anihoka ia   He'ato
    when TAM see   thither A.   DO H.
    me t=o   ia   mata'eina'a **me te   mave atu   ia   ia**:... (H-037)
    and   ART=POSS   3.sg village.people with ART welcome thither DO 3.sg
    When Anihoka saw He'ato and his men, (he) welcomed him:...

With respect to the expression of subjects and objects in NVCs of Marquesan we can so far conclude that NVCs shows nominal and verbal features alike. Although we have a derivation of a verbal clause into a noun phrase on the syntactic level, the assimilation to noun phrase syntax is only partial.

The partial assimilation to noun phrase syntax in NVCs of Marquesan might be due to a constraint in the noun phrase syntax of Polynesian languages. According to Clark (1981:71) only one postpositioned possessive phrase can be dependent on the lexical head of a NVC. Two postpositioned possessive phrases cannot be dependent on the same lexical head:

(31) te   humu'ia   o   te   puaka a   Teiki
    ART attch=*Perf/PASS   POSS   ART pig   POSS   T.
    1) *Teiki attached the pig
    2) The attachment of Teiki's pig

Teiki is not the initiator of the action, but only the possessor of the pig over which he has control (thus the a-marking).

Some ergative Polynesian languages like e.g. Samoan allow double possessive marking of agent and undergoer when one of the "possessors" is preposed in a pronominalised possessive phrase:

Samoan (Mosel 1992:275)
(32) ... l=o=na   sasa o   maile
    ART=POSS=3..sg   hit   POSS   dog
    His hitting of the dogs

In Marquesan, double possessive marking of subject and object does not occur in NVCs which have derived from active verbal clauses. Thus constructions like 'his hitting of the dogs' or 'his cooking of the fish' are not possible to construct, unless the corresponding verbal clause was passivized as in (33):

(33) **t=o**   ia   humu='ia **o**   **te**   **puaka**
    ART=POSS   3.sg attach=PASS POSS ART pig
His attachment of the pig

In passivized NVCs the undergoer is always expressed as a genitive attribute, simply because subjects are always expressed as genitive attributes in NVCs of Marquesan.
However, in nominalisations of active verbal clauses we do not have the co-occurrence of subjects and objects as two genitive attributes. It is only possible to construct 'his cooking the fish':

(34) **t=a**   ia   nunu'ia **i**   **te**   **ika**
    ART=POSS   3.sg cook=Perf DO ART fish
His having cooked the fish

Sentences like (32) and (33) are probably explained by a second constraint in nominalisations of Polynesian languages which is mentioned by Clark (1981:71): unmarked NPs cannot occur in nominalisations. Thus, in Samoan the unmarked undergoer NP has to appear as a genitive attribute. In Marquesan, on the other hand, where the undergoer NP in active verbal clauses is marked in the accusative, the language need not adopt to nominal syntax. However, if the verbal clause is passivized the syntax of nominalisations requires the unmarked undergoer NP to appear as a genitive attribute.
The reasons why Marquesan only allows constructions like (34) in NVCs which derive from active verbal clauses might be due to the retention of voice distinction in NVCs.

4.4 Do NVCs occur more with nominal or more with verbal modifiers?

Non-derived nominals in Marquesan can be typically modified by possessive phrases, relative clauses and by a class of state verbals which comprise lexemes such as kanahau "be nice", rui "be big". However, the head of a NVC can neither be modified by relative clauses nor by state verbals:

(35) *te   **nunu** <u>veve</u> i   te   ika
    ART cook fast   DO ART fish
? The fast cooking of the fish

Lexical heads of verbal clauses and NVCs are typically modified by verbal modifiers such as directionals (<u>mai</u> "hither" and <u>atu</u> "thither", <u>iho</u> "downwards, later") and adverbial modifiers. Non-derived nominals (e.g. te ha'e "the house") do not occur with directionals and other verbal modifiers. The ability of NVCs to occur with verbal modifiers is again evidence that many verbal properties have been retained in the lexical head of NVCs. Here are some examples:
Directionals
(36) 'u pei-pei He'ato me t=o   ia   mata'eina'a toa
    Perf RED-ready H.   with ART=POSS 3.sg village   warrior
no te   hiti <u>atu</u> 'i   te   toua umu huke 'i   Hiva 'Oa (H-036)
    for ART go.up DIR LD ART war   oven revenge LD H.   O.
He'ato and his village warriors were ready to go up to make a war of revenge at Hiva 'Oa.

11

Adverbial modifiers

(38) 'u tu-tukina te   menava me **te tahe anamai o   na   vaimata**. (Hak-?)
Perf RED-whiz   ART breath   with ART flow   suddenly POSS ART.PL tear

The breath was whizzing while the tears were suddenly running. (lit. 'with the running suddenly of the tears')

Conclusion

The lexical head of NVCs is neither purely verbal nor purely nominal because its syntactic properties, as we have seen, are verbal as well as nominal.

	Verbal	Nominal
case		+
definiteness		+ (only <u>te</u>)
plural markers		-
numerals		+
genitive attributes		+
relative clauses		-
state verbals		-
negation	-	+
Tense/Mood	-	
Aspect	+	
number agreement	(+)	
voice	+	
verbal modifiers (directionals, adverbials)	+	

Table 1: Verbal and nominal properties of NVCs

From a syntactic point of view, nominalisation of verbal clauses in N-MQA is a process by which verbal clauses become noun phrases. Although there is a shift in structural level from clause to phrase which also changes the valency of the lexical head of nominalised verbal clauses (now being the head of an NP it cannot have a subject, but only a possessive attribute), the assimilation to noun phrase syntax is only partial (the expression of subjects as genitive attributes, the loss of tense and mood marking, and the usage of nominal negation). The internal structure of nominalised verbal clauses clearly shows that many verbal properties have been retained (such as aspectual marking, verbal modification and the case-marking object NPs). Therefore we can classify the lexical head of NVCs as a verbal-nominal hybrid which is generated on a syntactic level of nominal derivation.

Verbal clause	→	Nominalised verbal clause
1. TAM Vtr S - O (i-NP)	→	ART Vtr a/o-POSS NP (S) - i-NP (O)
2. TAM Vitr S	→	ART Vitr o-POSS NP (S)
3. TAM Vneut S - OBL (i-NP)	→	ART Vneut o-POSS NP (S) - i-NP (OBL)
4. TAM Vpass S - A (e-NP)	→	ART Vpass o-POSS NP (S) -e-NP (A)
	→	ART=o/a PrePoss (A) Vpass o-POSS NP (S)

Table 2: Syntactic transformation and case-marking of NVCs

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Phonological structures and expressiveness: the role of iconicity in 'the emergence of the marked'

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> 'Tis not enough no harshness gives offence,
> the sound must seem an Echo to the sense'
> Alexander Pope 1711

It is a commonplace crosslinguistically that exceptions to phonological regularities are often manifested in vocabulary broadly classifiable as 'expressive'. Fudge's observation echoes views dating back to at least the Prague School linguists (Uhlenbeck 1950, Trubetzkoy 1939):

> Expressive words [...] have a tendency in a wide range of languages to be associated with peculiarities of phonological structure [...] including types of sounds, sound sequences and syllable-structures which can be regarded as peripheral in the language concerned (Fudge 1970:161).

In English, for example, long vowels and diphthongs never occur before [ŋ] – except in onomatopoeic words like *oink* and *boing*. Similarly, clicks and nasal vowels do not occur in the phonology of English – except in pragmatically-charged interjectory particles, such as *tut-tut!* and *huh?* ([hã]) respectively.

It is generally assumed that departures from phonological regularities such as these, though recurrent crosslinguistically, are insignificant in number, and so can be safely ignored in a theory of language. Fudge however provided strong statistical arguments that this is not the case, and that for English at least the correlation pervades the lexicon. In Clynes 1995 I showed that this was true too in Balinese. The correlation is in fact predicted to occur by the hypothesis of 'Foregrounding', that marked structure at all linguistic levels regularly regularly associates with expressive semantics (Mukarovsky 1964, Leech 1966, Fowler 1984, cf Appendix, below). Still, just why Foregrounding occurs, and how it relates to a theory of language, remains to be clarified.

Writing on related expressive morphology effects (such as expletive infixation) Zwicky & Pullum (1987:338) assert that these are 'not within the province of the theory of grammar as ordinarily understood, though [...] certainly within the broader sphere of human linguistic abilities.' I would argue that such phenomena in fact provide important information for a theory of grammar. Nonetheless, Zwicky & Pullum's intuition is broadly correct: a nonlinguistic principle or principles is no doubt involved in interactions between marked structure and semantics, though clearly it interacts with linguistic principles. I argue in §2 for a physiologically-based iconic motivation for Foregrounding, which can be considered to manifest the 'emergence of the marked' (cf McCarthy & Prince 1994), (see §4).[1]

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[1] The term 'marked' in Praguian usage has meanings such as: 'what departs from the neutral' (Kean 1992:390), even 'unusual' or 'irregular' (Waugh & Lafford 1994). In Optimality Theory the term has a different, if related, understanding: any structure violating a given constraint is said to be marked with

The paper has four parts. In §1 I exemplify and give statistical evidence for the operation of Foregrounding in the phonology of Balinese. In §2 I argue for a physiologically-based iconic motivation for Foregrounding. In §3 I discuss other approaches to accounting for the correlation, and show that they all need to be augmented by principles such as those argued for in §2. In §4 I briefly sum up and draw some more general conclusions.

1. EVIDENCE FOR FOREGROUNDING IN BALINESE. In Balinese, phonological structures which are demonstrably dispreferred in the language nonetheless occur, though where they do they predictably associate with expressive meanings. For example, complex syllable onsets represent a more marked option both in Balinese and crosslinguistically (see for example Blevins 1995, Prince & Smolensky 1993, McCarthy & Prince 1994). Where they occur morpheme medially in Balinese – the most marked option crosslinguistically (Steriade 1982, 1988, Golston 1996:739) – complex onsets associate particularly strongly with 'expressive' meanings. A representative sample is given in (1); it includes semantic types (defined below) typically associating with morphemes of this structure.

(1)   damprat   'yell furiously at'   BAD, SENSE (sound)
       caplok   'eat piggishly, gobble'   BAD, SENSE (movement)
       buŋlun   'burnt outside, raw inside'   BAD, SENSE (taste/sight)
       siŋlad   'awkward, clumsy'   BAD, SENSE (movement)
       kəcrit   'sound of spurting water'   SENSE, (sound)
       kəbles   'suddenly emerge, pop out'   SENSE, (movement)

Similarly, exceptional 'allophonic' structures in Balinese predictably associate with expressive pragmatic overlay. High vowels in final closed syllables in Balinese are usually lax *kucit* [kucɪt] 'piglet', *kətut* [kətʊt] 'personal name'. The one exception to this regularity is in certain exclamatory usages:

(2)   actual   expected
       dut!   [du(:)t]   [dʊt]   'exclamation of derision'
       tin!   [ti(:)n]   [tɪn]   'sound of car horn'

Note that the distribution of [u] and [ʊ] is otherwise purely complementary, as is that of [i] and [ɪ].[2] For further examples involving other vowels and consonants see Clynes 1995.

Claims such as those exemplified above remain anecdotal, in the absence of (i) evidence for the phonological marginality of the structures concerned (ii) statistical evidence of a correlation with specific expressive meanings. Evidence that complex syllable onsets are dispreferred in Balinese comes firstly from productivity in coining new morphemes. The canonical shape of a morpheme in Balinese, as in the closely related Javanese

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that a 'more-marked candidate' output in OT terms is 'marked' in a Praguian sense as well, hence refer loosely to 'marked' or 'more-marked' structures as a cover term for both.

[2]Balinese has the following phoneme inventory: vowels /i, u, e, o, ə, a/, consonants /p, b, m, w; t, d, n, l, r; c, j, ɲ, s, y; k, g, ŋ, h/.

(Uhlenbeck 1950), is a disyllabic CV(N).CVC sequence, where N is a nasal stop homorganic with the following consonant. Syllables with complex onsets, of shape CLV(C), where 'L' represents any of /l, r, w, y/, also occur. All other things being equal, we would expect four times as many morphemes of shape CLV(N).CVC, or CV(N).CLVC, to occur as do those of shape CV(N).CVC, containing only simple onsets. Instead, as Table 1 below shows, for morphemes of otherwise identical structure, those with simple onsets (row 1) consistently occur much more frequently than those with complex onsets at the left edge (row 2), while those with morpheme-medial complex onsets are even less common (row 3). In fact there are nearly 20 times as many morphemes of the preferred shape CVCVC as there are of shape CVCLVC:

CV.CV	966	CVC.CV	490	CV.CVC	4410	CVC.CV	2070
CLV.CV	185	CLVC.CV	51	CLV.CVC	811	CLVC.CVC	398
CV.CLV	92	CVC.CLV	23	CV.CLVC	242	CVC.CLVC	179

Table 1. Frequency of complex onsets in morphs of comparable structure, in Panitia 1990): (χ =51.13, p < .001) from Clynes 1995.

A second type of evidence that these structures are dispreferred comes from reduplication: complex onsets found in the base are not copied to the reduplicant in Balinese, as the examples in (3) illustrate (cf McCarthy & Prince 1994); 3a&b illustrate straightforward derivations involving reduplication, 3c illustrates a class of 'inherently reduplicated' lexemes where an otherwise non-occurring monosyllabic base is reduplicated:

(3)   a. slampar   'throw' > -sə-slampar-an 'throw (vi, DIST)'

        b. blakas   'chopper' > bə-blakas-an '(talk) trenchantly'

        c. crukcuk   /REDcruk/ 'kind of bird'

Where morphemes consist of a reduplicated C_1LVC_2 sequence (3c), the expected L-segment in the medial onset is always missing: *crukcuk* 'k.o. bird' (*crukcruk*, *cukcruk*). Overall, then, evidence from both (i) relative frequency in the lexicon and (ii) two distinct reduplication processes indicates that complex onsets are disfavored in Balinese, and least favoured of all where they occur morpheme-medially.

Statistical evidence of the correlation of such marked structures with specific expressive meanings was provided as follows (see Clynes 1995 for a fuller discussion). Samples of morphemes containing suspect structures, as well as a control sample, were examined for the presence of the following semantic types, often said to be associated with expressive lexis (Uhlenbeck 1950, Fudge 1970, papers in Hinton et al 1994):

(4)   Diagnostic expressive semantic types:

- SENSE IMPRESSIONS: any morpheme which lexicalizes impressions of sound ("onomatopoeics"), sight, touch, taste or smell, (e.g. in English *"smooth"*, *"rough"*, *"sweet"*, *"sour"*, *"bright"*, *"dull"* *"dazzle"*)

17

- MOVEMENT VERBS: morphemes which lexicalize movements of the body, and of body parts, such as (in English) *skip, shuffle, twitch, limp* and so on. Also movements of other animate & inanimate entities e.g *trickle, shoot* (i.e. move quickly e.g. of a comet) [actually a subset of the SENSE IMPRESSION class]
- FEELING/EMOTION: morphemes lexicalizing FEELINGS and emotions (e.g. *greed(y), love, hate, boredom, boring, curious, curiosity*) [also in the SENSE IMPRESSION class]
- BAD: morphemes (i) with pejorative value (*cruel, nasty, showoff*), or (ii) which refer to undesirable things (e.g. *evil spirit*) or undesirable states, either mental, (e.g. *crazy*), bodily (*headache, smallpox*), or atmospheric (*flood, earthquake*).

Note that these meanings are used here (and in Clynes 1995) purely as a practical diagnostic tool: they are not claimed to represent either semantic primitives (though see Wierzbicka 1996 on *bad* and *feel* as semantic primitives), nor grammaticized subclasses within the lexicon. (Another functional class associating strongly crosslinguistically with aberrant or exceptional phonological structures is that of *loanwords*. I discuss reasons for grouping them with expressive lexis in Footnote 3 below: this approach is important to the discussion of Itô & Mester's approach in §3.[3] I stress that loanwords are not included in the statistical counts now discussed.)

A volunteer who had no knowledge of the hypothesis being tested was given a list of *just the meanings* (and not the associated phonological structures) of a random sample of 175 morphemes of shape $(\sigma).\sigma.CLVC$, as well as 175 from a separate 'control' group of morphemes, chosen as having the most regular possible phonological structure in Balinese; in both cases Panitia 1990 was the source of data. The volunteer then classified the meanings of the two samples, either into one of the four types in (4) above, or into another class, 'not one of the above meanings'. These results are summarised in Table 2, where column 2 gives the total number of meanings classified into one of the four diagnostic classes (here designated as 'expressive'), for each group, and column 3 the total number meanings classified as 'other':

	'expressive' meanings	'other' meanings
$(\sigma).\sigma.CLVC$ sample	65%	35%
'unmarked' sample	37%	63%

Table 2: Classification of meanings of (i) 175 morphemes of shape $(\sigma).\sigma.CLVC$ (Row 1) and (ii) 175 morphemes of 'unmarked' phonological shape (Row 2). See Appendix 1 for full data & analysis. $Z = 5.46$, $p < .0001$, Median Test

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[3]Crosslinguistically loanwords associate strongly with aberrant or exceptional phonological structures - see for example Chomsky and Halle 1968:373, Itô & Mester 1995a&b, Paradis 1996. It is uncontroversial that affective pragmatic elements are associated with loanword usage, at least in the initial phase of borrowing, when such words are still seen as foreign. Hock & Joseph for example argue that connotations of prestige are one of the principal motivating factors in the adoption of loanwords into a language (see Hock & Joseph 1996:271ff). Some loanwords have other affective associations - either pleasurable (*karaoke, tango*) or otherwise (*voodoo, ebola*). I conclude that a great many loanwords first enter the lexicon because of their affective pragmatic/semantic associations. To that extent they minimally share a common prelinguistic affective context with the other semantic types referred to here as 'expressive', and so can be plausibly grouped with them.

An appropriate statistical test (the Median Test, cf Spiegel 1972, Hatch & Lazaraton 1991:271) indicates that the probability of getting the difference in proportions between the two samples in Table 2 in a purely random way is less than one in ten thousand. We thus have good statistical support for a correlation between the otherwise dispreferred phonological structure, and the expressive meanings associating with that structure.

Very similar results are obtained when morphemes containing OCP violations are examined. Many languages disprefer the cooccurrence morpheme-internally of consonants sharing the same place of articulation; these include the related Javanese (Uhlenbeck 1950, Yip 1989), Semitic languages (Greenberg 1950, McCarthy 1994, Frisch, Broe and Pierrehumbert 1997), and English (c.f. Fudge 1970, Borowsky 1986, Davis 1990, Clynes 1995). In Balinese, as in Javanese, such sequences are a more-marked structural option. Occasionally they are eliminated from loanwords, viz. *kompa* 'pump' from Dutch *pomp*, and *gumi* 'world', from Sanskrit *bumi*, *gəndela* (~ *jəndela*) 'window' from Portuguese *janela*, and *klana* (~*clana*) 'trousers' from Hindi *carna:*. More often, however, these structures are tolerated - particularly where they occur in morphemes with expressive meanings. This gives rise to the following striking example of the productive use of formally dispreferred phonological structures to generate expressive vocabulary.

Statistics presented in Table 3 clearly suggest an avoidance of morpheme shapes where more than one labial, apical stop, laminal (c, j, ɲ or s), or liquid (except, as in Javanese and other related languages, when /l/ precedes /r/, cf Uhlenbeck 1950) cooccur.

	p	b	t	d	l	r	s	k	g	ŋ
p	1	1	120	36	64	69	76	131	22	144
b	3	0	105	21	89	64	77	124	58	145
t	21	16	17	19	59	41	110	138	37	125
d	12	0	26	1	31	14	15	48	9	55
l	15	15	78	47	0	100	65	80	48	116
r	11	10	59	14	4	0	18	58	26	63
c	9	7	65	10	34	38	17	135	22	122
j	4	0	45	5	15	26	13	29	27	59
ɲ	2	1	9	5	3	1	0	2	9	18
s	51	28	187	52	63	118	7	97	52	176
k	33	27	157	55	68	100	115	193	42	243
g	22	3	101	6	64	89	66	93	80	188

Table 3. Numbers of morphemes of structure /#C... ...C#/ in Panitia 1990 (column=Initial C, row=Final C). The boxed areas contain homorganic combinations. /s/ is the only laminal to occur morpheme-finally.

There are in general low numbers of morphemes with such shapes, particularly so where the initial and final segments are identical: /p... ...p/, /b... ...b/, and so on. However, those statistics also suggest that stop consonants belonging to the remaining place category, dorsal, can cooccur freely. In fact there are *more* morphemes with dorsals in both initial and final positions, than morphemes with any other place-place combination. It turns out, however, that morphemes with both initial and final dorsal consonants are almost exclusively classifiable as expressives. A representative sample of morphemes of shape /k ... ... k/, with their meaning types, is given in (5):[4]

(5) kaŋgǝk   'momentarily brought to a stop'   MOVEMENT
     kaak,kǝǝk   'sound of someone bringing up phlegm'   SOUND
     kacak   'in a mess, scattered all over the place'   BAD
     kacwak   'cockroach'   ANIMAL*
     kacek   'not enough (counted wrongly, of money)'   BAD
     kadeŋklok   'trip up because foot caught'   BAD, MOVEMENT
     kagek   'suddenly come to an abrupt stop'   MOVEMENT
     kagok   'speechless & unable to reply'   BAD
     kaikik   'kind of banana'   PLANT*
     kakak   'laugh loudly'   SOUND

Table 4 compares classifications of the meanings of a sample of 125 morphemes of shape /#k... ...k#/, with those of the control group:

	'expressive'	'other'
/k... ...k/ sample	62.4%	37.6%
'unmarked' sample	37%	63%

Table 4: Classification of meanings of (i) 125 morphemes of shape /k... ...k/ (Row 1) and (ii) of 175 morphemes of 'unmarked' phonological shape (Row 2). $Z = 4.48$, $p < .0001$.

Again morphemes with the marked (/k... ...k/) structure associate with a far higher proportion of the diagnostic 'expressive' meanings than do those in the control sample. The Median Test again indicates an extremely low possibility that this could be due to random effects. The conclusion seems inescapable that this formally less-than-wellformed structure, like a variety of other such structures in Balinese (Clynes 1995) is preferred in the coining of expressive lexis. Further cross-linguistic evidence of the correlation argued for here is provided for example by Uhlenbeck 1950 (for Javanese), Fudge 1970 (English, etc), Hinton et al (North American, African languages), and Klamer 1998 (Kambera and other Austronesian languages).

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[4]Note that this sample includes two names of Plants and Animals, semantic types also commonly associating with 'marked' phonological structures see Trubetzkoy 1939, Uhlenbeck 1950, Hinton et al 1994. These types were not included in the statistical testing. For some evidence that these behave as ɔxpressives in linguistic patterning see the handout for this conference paper, available from me directly at aclynes@fass.ubd.edu.bn. Some nonlinguistic evidence is discussed in Clynes 1998.

§2 ACCOUNTING FOR THE CORRELATION. In this section I will first discuss the Foregrounding hypothesis, Klamer's (1998) account of it (though she does not use that term) in terms of iconicity, and then propose an alternative model.

The claim that unusual or marked structures correlate with expressive semantics is a very old one. It is at the heart of the Foregrounding hypothesis, as developed by Prague School writers (for example Mukarovsky 1964 [1932] and Jakobson 1965) out of earlier ideas of the Russian Formalist school of literary analysis (Shklovsky's 'estrangement', cited in Van Peer 1994). Foregrounding was said to involve 'the aesthetically intentional distortion of linguistic components' (Mukarovsky 1964:23). Poetic license effects thus exemplify one of the principle Foregrounding strategies, 'deviation', or the deliberate violation of linguistic norms for pragmatic effect (Leech 1966, Van Peer 1994). However, Foregrounding is not a characteristic exclusive to literary texts. Mukarovsky recognized that it was common in journalism, and its use has since been identified in many other discourse and grammatical contexts (Jakobson 1965, Fowler 1981, 1986, Cook 1994, Van Peer 1994. See the Appendix below for exemplification from a variety of linguistic levels.). The correlations between marked phonological shape and expressive semantics demonstrated above (and for example by Fudge 1970, Clynes 1995, Klamer 1998) are thus predicted to occur by the Foregrounding hypothesis.

The Foregrounding hypothesis however is not in itself an explanation, but rather a statement of a correlation, one which invites an explanation. A partial account of *why* Foregrounding occurs has been offered by some of the above authors. In particular two characteristics of marked structures (in a Praguian sense) have been proposed which help explain why they are sometimes preferred ahead of more-wellformed ones. These are given in (6) and (7) (except as indcated, the wording and the terms 'Heightened Salience' and 'Potential for Interpretation' are mine):

(6)   *Heightened Salience:* a more-marked structure occurring where a less-marked one is available is perceptually more salient than the less-marked alternative. [cf Mukarovsky 1932/1964, Leech 1966]

(7)   *Potential for Interpretation:* A more-marked structure occurring where a less-marked one is available 'invit[es] interpretation' (Fowler 1986:73).

We thus notice more-marked structures more readily than less-marked ones (Heightened Salience), and where they are used, we seek to make sense of that use (Potential for Interpretation). Heightened Salience appears well motivated as a manifestation of basic cognitive principles. Some have for example seen the Praguian marked-unmarked dichotomy as one manifestation of a more basic opposition, such as the Figure-Ground of Gestalt psychology. Leech (1966) draws parallels between Foregrounding processes and the Figure-Ground notions. Assuming that such connections are wellfounded, and that linguistic patterning is in part 'driven' by such more basic cognitive factors, (6) in itself brings no added baggage to a theory of linguistics. 'Potential for Interpretation' (7) too appears to be plausible and in harmony with (and ultimately motivating?) pragmatic principles such as Grice's Maxim of Manner (1975). Nonetheless a problem remains: why should the natural interpretation of the use of more-marked structures be

that an expressive semantic/pragmatic element is intended? The same objection applies to a modified version of (7), such as (8):

(8)   *Potential for Interpretation (revised):* A more-marked structure occurring where a less-marked one is available 'invit[es] an expressive interpretation'.

One account which might explain (8) is offered by Klamer 1998, who suggests that the correlation between dispreferred phonological structures and expressive semantics is iconically motivated, in the sense of Pierce's diagrammatic iconicity (see Jakobson 1965, Haiman 1994). Klamer argues that dispreferred phonological structures and expressive lexis are both perceived to be 'peripheral' with respect to (respectively) the rest of the phonology and the rest of the lexicon (cf Uhlenbeck 1950 and Ito & Mester 1995a&b for related views). This common feature of peripherality then motivates a natural association of the two elements: peripheral phonological structures are selected to give form to peripheral semantic structures.

(9)

central phonological structures	<< association >>	central semantic types
...		...
peripheral phonological structures	<< association >>	peripheral semantic types
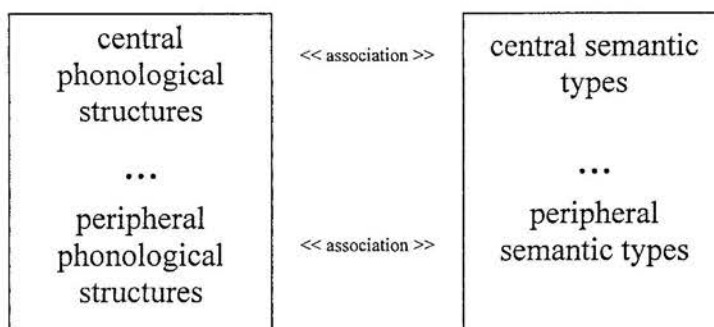
Klamer's proposal is however problematic: it is unclear why the kinds of meanings listed in (4) should be perceived as semantically 'peripheral', indeed it is unclear how the centre-periphery metaphor applies to semantic elements. The objection remains even if we replace 'peripheral' with, say, 'exceptional': while the phonological structures are clearly so, in what way are the diagnostic meanings 'exceptional' meanings? This version of diagrammatic iconicity is then insufficiently elaborated: it requires a bipartite division of meanings stored in the lexicon, but does not offer independent evidence for that division (as opposed to any other of the infinite number of possible ways of thus dividing up the lexicon).

Moreover, it is too limited in that it refers exclusively to linguistic elements, when Foregrounding effects also apply in a variety of paralinguistic and non-linguistic semiotic contexts: e.g. the use of italic and other marked fonts and graphemes to convey expressive meanings (see Appendix), and the attention-getting use of striking visual or aural elements in advertising (Jakobson 1960, Fowler 1981, 1986, Cook 1994). Indeed, the use of marked physiological signals is basic to the prelinguistic communication of emotions such as aggression, fear and sexual desire, not only in humans but in animals. A satisfactory account will have the potential to explain all such associations.

Still, Klamer's intuition that Foregrounding should be accounted for in terms of iconicism is appealing: such a basic, prelinguistic motivation is needed to account for the recurrent correlation cf marked structure and meaning at all levels (cf Zwicky &

Pullum 1987). This paper agrees then that diagrammatic iconicity does motivate Potential for Interpretation (8), but proposes that, as with the well attested cross-linguistic correlation of the high front vowel with the semantic element 'smallness', the correlation has a physiological, rather than purely linguistic grounding (Diffloth 1994).

Expressive language use conveys information about the feelings of the speaker. At the most prototypical level its use is associated with heightened affective states, such as anger, fear, joy or sexual desire. Such states naturally associate with marked physiological states (or 'structures') such as increased cardiac and respiratory rates, and with biochemical events such as production of adrenaline. Such physiological states differ then in various categorical, quantifiable ways from rest states, those associated with neutral affective states. These very natural associations are diagrammed in (10):

(10)

neutral *affective* states	<< >>	unmarked *physiological* states/structures
heightened affective states	<< >>	marked physiological states/structures

The natural associations in (10) are then exploited and developed in the communication of emotion: neutral affective states cooccur with and so are naturally expressed by unmarked *semiotic* structure, including linguistic structure. Equally, heightened affective states cooccur with and so are naturally expressed by marked semiotic structure, including linguistic structure; such structures are therefore preferred in the linguistic encoding of emotion or expressivity: .

(11)

neutral affective states	<< >>	unmarked structure
heightened affective states	<< >>	marked structure

This physiologically-grounded iconicism thus explains *why* the use of more-marked structures where less-marked one is available should receive an expressive interpretation (cf (8)). We have then not only a primary motivation for Foregrounding effects in linguistic communication, but also for parallel effects found in the prelinguistic communication of emotions, in both humans and animals.

3. ALTERNATIVE ACCOUNTS. Here I will briefly sketch some alternatives to the account presented above, and show that minimally they all require augmentation by a principle

or principles motivated the licensing of exceptional structure such as those discussed above.

3.1 SUBGRAMMARS. One approach to accounting for departures from wellformedness patterns holding generally in the grammar, has been to assume the existence of subgrammars applying to just one subset or 'stratum' of the lexicon. This approach is found in some analyses in the Optimality Theory framework (Prince & Smolensky 1993), such as Itô & Mester's accounts of various lexical phenomena in Japanese (1995a,b).[5] They suggest that the lexicon of Japanese is subdivided into various lexical strata, each of which constitutes 'a genuine morphological class [...] which can be referred to as such in the grammar (1995b:185)'. Five such putative strata are discussed: the canonically wellformed Yamato lexis (consisting mainly of native items), plus four strata allowing a range of structures not found in the Yamato stratum: the Sino-Japanese stratum (loanwords), the large Mimetic stratum (expressives), the Foreign stratum (partly assimilated loanwords) and the Unassimilated Foreign/Alien stratum (loanwords plus some native expressives - swearwords, exclamations, and lexicalized casual speech forms). As in Balinese and English then, morphemes associating with phonological structures not tolerated in the core native lexis are generally either expressives or loanwords.

Itô & Mester assume the standard OT assumption of a single Constraint ranking across the grammar with the exception that the ranking of the class of Faithfulness constraints with respect to other constraints is not constant, but rather varies with different strata. The general principal is illustrated in (12):

(12)
- Yamato lexis   C1 >> C2 >> C3 >> C4 >> <u>FAITH</u>
- Sino-Japanese loans   C1 >> C2 >> C3 >> <u>FAITH</u> >> C4
- Mimetics   C1 >> C2 >> <u>FAITH</u> >> C3 >> C4
- Foreign   C1 >> <u>FAITH</u> >> C2 >> C3 >> C4

In strata where Faithfulness constraints are low-ranked, such as the Yamato lexis, underlying structures violating relatively higher ranked constraints (say, C2 to C4 in (12) cannot surface. However in strata such as the Foreign stratum, a variety of structures violating those constraints surfaces, the now more-highly-ranked Faithfulness constraints imposing their emergence.

Using this approach, the occurrence in Balinese of otherwise disfavored structures such as the morpheme-medial complex onsets discussed in §1 is explained as follows. In a subgrammar 'A' encompassing the major part of the lexicon such structures could never surface, even if they were to occur underlyingly, since they would be blocked by the constraint ranking *σ.CLV >> FAITH (where * σ.CLV is a shorthand for the complex of constraints blocking such structures; see Golston 1996 for one more detailed analysis.). Morphemes containing σ.CLV sequences *could* however surface in a Subgrammar B, where the reverse constraint ranking, FAITH >> * σ.CLV, obtained.

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[5]Inkelas, Orgun and Zoll (1996), as well as Itô & Mester 1995r &b provide surveys of previous work assuming subgrammars, 'cophonologies' (IO&Z) or 'stratification of the lexicon' (I&M).

The account offered by Itô and Mester appears to be very constrained, with a single constraint hierarchy apparently prevailing throughout the lexicon, and with generally only Faithfulness constraints rerankable. It nonetheless has several major problems. Firstly, and fundamentally, it fails descriptively, in that there are many surface counter-examples to the structural types predicted to occur by Itô & Mester's model. From the examination of such exceptional data Rice (1997) concludes that the phonological evidence for the lexical stratification is not strong.[6]

Three further major failings of the subgrammar hypothesis from the point of view of the present study are that (i) the correlation between marginal phonological structure and the expressive (Mimetic) and loanword types both in Japanese and crosslinguistically is neither predicted nor addressed (ii) more generally, the correlation of marked structure with expressive usages at other levels, linguistic and otherwise (cf Appendix), is not addressed (iii) the approach is stipulative, in that it does not explain *why* stratum-specific reranking of constraints should occur. The sub-grammar approach needs to be augmented with principles such as those proposed in §2, in order to eliminate these latter three problems at least.[7]

3.2 LEXICAL PRESPECIFICATION. As an alternative to the subgrammar approach, Inkelas, Orgun & Zoll (1996 and earlier versions, 1997) and Rice (1997) argue for lexical prespecification - that morphemes which violate constraints posited to hold elsewhere in the lexicon are individually prespecified in their underlying representations for the relevant phonological structures, with highly ranked faithfulness constraints again imposing the exceptional structures. Inkelas, Orgun & Zoll 1997 argue that prespecification has advantages over a subgrammar analysis, including enabling a single constraint ranking throughout the lexicon, rather than an excessive proliferation of subgrammars. This claim is however still vulnerable to a charge levelled at the subgrammar approach, that it runs counter to the spirit of OT in allowing apparently unconstrained (if now lexically-specified) reranking of Faithfulness constraints: the ideal of a single constraint ranking throughout the lexicon is not fully realised.

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[6]And despite the strong claim that 'in a substantial class of cases, constraint reranking can be limited to a reranking of Faithfulness constraints, within an otherwise invariant ordering of constraints' (1995b:206) at least two other constraint classes must be reranked: (i) the class of Alignment constraints must be reranked to account for unusual structural features of the extensive (and semantically expressive) Mimetic lexis, (1995b:190)), and (ii) 'correspondence-sensitive' constraints must be promoted to explain the behavior of unassimilated loanwords (Itô and Mester 1998). The appeal to a stratified lexicon, plus limited constraint reranking, looks then increasingly ad hoc given the significant numbers of exceptions to Itô and Mester's generalizations, and as the number of constraint classes which must be reranked increases. Reranking of Faithfulness constraints alone would certainly not account for the Balinese data, since many 'more-marked' structures occur where the imposition of Faithfulness constraints cannot be plausibly invoked, such as in the coining of neologisms with marked structures (for example the productive class of Bad Nicknames, see footnote 8), where Faithfulness constraints are not yet relevant, since candidate structures for neologisms have no underlying representation which Faithfulness could impose.

[7]Inkelas, Orgun & Zoll 1996, 1997 discuss other general theoretical objections to this approach. Most telling perhaps is that the lexical stratification hypothesis is simply too powerful, generating too many subgrammars. They moreover show that information about exceptionality must be specified at the segmental level, rather than that of morpheme or morpheme class.

One prespecification approach which may avoid this charge is that of Golston's Direct OT (1996). In Direct OT 'morphemes are represented by the constraints they violate at surface structure. [...] Most roots and affixes are represented directly by NO*f[eature]* and ALIGN*f* violations' (Golston 1996:725). The highly marked Balinese pejorative nickname [ʔʊʔ] (which has an otherwise non-occurring initial glottal stop, as well as a OCP violation) can for example be represented as:[8]

(13)

OCP	No[σʔ	NoSTOP	NoGLOT	No HI	NoRND
R	R	RR	RR	R	R

where R indicates a 'distinctive constraint violation'. [ʔʊʔ] is then straightforwardly a 'marked' form because its desiderata include distinctive violations of two very highly ranked constraints, OCP and NO[σʔ.

Amongst the advantages of Direct OT are that it straightforwardly allows a single constraint hierarchy, it avoids a proliferation of diacritic marking, of subgrammars, or of FAITH types (as found for example in Fukazawa et al's 1998 modified sub-grammar approach). Moreover, the Praguian 'marked – unmarked' distinction is retained in this and other prespecification approaches, whereas it is obscured by a subgrammar analysis.

However even Golston's version of prespecification is not without its own problems. Like the alternatives surveyed above, it does not explain interactions of semantics and phonology correlations. As long as it is unmotivated, prespecification like stratification is too powerful. None of the versions of prespecification proposed above explains either *why* exceptional prespecification should be available at all, or why specific items come to be treated in different ways by the grammar. In the case of expressives (including loanwords, see Footnote 3) the iconic factors driving Foregrounding outlined in §2 provide such a motivation.

4. CONCLUSIONS. In the introduction it was argued that both nonlinguistic and linguistic factors must be involved in the interaction of marked phonological structure and expressive semantics, exemplified in §1. I then sketched an account of such factors in §2, where it was argued that Foregrounding effects are naturally explained by the Heightened Salience (6) and Potential for (Expressive) Interpretation (8) of marked structures; Potential for Interpretation is in turn motivated by the 'physiologically-grounded' iconic model proposed there. These functional principles, plus iconically-driven licensing of exceptional outputs, provide an important missing element to accounts such as Golston's Direct OT (§3), which enables a formal description of exceptionality effects in the phonology, but does not explain them. How Foregrounding effects in other linguistic and paralinguistic contexts would be treated formally remains

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[8]Virtually all Balinese are given a 'bad name' (*adan jəle*) as a child; these pejorative nicknames are often 'meaningless' but always phonologically marked, so inelegant if only because of their marked shapes; see Clynes 1995a&b. Bad names are a source of embarrassment as an adult, and are naturally classifiable into the BAD semantic/pragmatic type.

to be described, however functional principles such as those described in §2 above are clearly needed in all such cases.

McCarthy & Prince's characterise the process of 'emergence of the unmarked' as follows:

> 'Even in languages where [a constraint] C is crucially dominated [e.g. by Faithfulness constraints, AC] and therefore violated, the effects of C can still be observed under conditions where the dominating constraint is not relevant. Thus, in the language as a whole, C may be roundly violated, but in a particular domain it is obeyed exactly. In that particular domain, the structure unmarked with respect to C emerges, and the structure marked with respect to C is suppressed' (McCarthy & Prince 1994:333)

Foregrounding effects, which link with formally more-marked structure with expressive semantics, can reasonably be said to manifest the reverse effect, of 'emergence of the marked', given that (paraphrasing and modifying the above) that "even in a language where a constraint C is not normally violated, the effects of violation of C can be observed under conditions where violation of that constraint is licensed by other principles [those described in §2 above]. Thus, in the language as a whole, C may be obeyed exactly, but in a particular domain it is roundly violated. In that particular domain, the structure *marked* with respect to C emerges." This claim is compatible with either of the formal models (prespecification, subgrammars) described above.

The data examined here are then strong evidence that functional principles not only interact with formal ones in the determination of linguistic outputs (as argued for example in the work of Boersma 1997, Steriade 1993, Flemming 1995, Jun 1995, Kirchner 1998), but that in the right context they can be seen to override concerns of purely formal wellformedness. To that extent Foregrounding effects provide evidence that functional/semantic desiderata outrank purely formal principles in the determination of linguistic outputs. Language is indeed 'a system where everything "conspires" to convey meaning' Wierzbicka (1988:1).

Acknowledgements

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Appendix

The broader context: other correlations of marked structures and expressive semantics.

Any approach that seeks to explain only correlations of phonology with expressive semantics has a further major shortcoming: those correlations are merely one expression of a phenomenon manifesting itself at all levels of linguistic structure. Expressive semantic features regularly associate with marked structures, not just at the phonological level, but also at the levels of morphology, syntax, discourse, and paralinguistics. In this appendix I illustrate a variety of such effects, which clearly require a common account.

1 EXPRESSIVE MORPHOLOGY. Pullum & Zwicky (1987) describe a variety of aberrant structural features, characteristic crosslinguistically of expressive morphemes (such as diminutives and, in English, 'whimsical' affixes of the *-eria/-ette* type). These include a) 'promiscuity of input category', b) 'promiscuity of input base', and c) 'alternative outputs'.

'Promiscuity of input category', refers to the unusual ability of expressive morphemes to combine freely with bases of virtually any lexical category: thus 'expletive infixes' in

English can irrupt variously into nouns (*kanga-bloody-roo*), adjectives (*fan-friggin-tastic*), verbs (*e-friggin-vaporate*), adverbs (*abso-bleeding-lutely*) and interjections (*halle-bloody-lujah, ho-bloody-ho*), and always of course for jocular or other expressive effects.[9]

'Promiscuity of input base' allows morphemes used expressively to combine not merely with other simple morphemes, but with more complex units such complex proper nouns (*Andy friggin' Williams, West friggin' Virginia*), other compounds (*phantom frigging army, rail bloody way*), and longer lexicalized expressions (*hopping goddam mad, fat frigging chance*). Expressive morphology also often produces 'alternative outputs': e.g. both *Kala-goddam-mazoo* and *Kalama-goddam-zoo* are accepted by many speakers, whereas plain derivational morphology allows only a single possible output. Descriptions of comparable phenomena in other languages are found for example in Uhlenbeck (1971), Stump (1993), and Bauer (1998).

2 EXPRESSIVE SYNTAX. Marked syntactic constructions also correlate with expressive semantics. In English, for example, all predicates must contain a verb phrase – except in a few highly expressive 'exclamatory' constructions, where certain nominal predicates are permitted:

(1)   a.   You rat!/angel!(/*person!/??linguist!)
        b.   Semantics shemantics![10]
        c.   A semantic account, my eye!

Exclamatory particles used as single word utterances constitute no doubt the most marked syntactic 'structure', to the extent that they are generally treated as paralinguistic elements. They are almost always pragmatically charged: *Halleluia! Shit! Hooray! Ouch!...* Often they are phonologically exceptional as well: *Shh(t)! Huh? Psst! Phew! Brrr! Yechh! Oh-oh!*.

The mismatch between levels involved in expletive infixing – units which normally function as whole words instead functioning as modifying affixes - has parallel manifestations in syntax, when entire phrases (PP's) can be lexicalized as premodifying elements within noun phrases, but only where they are used for expressive effect (c. f. *the on-the-corner* house). The structure involves some kind of weight violation, with the heavy modifier preceding rather than following the head:

(2)   a.   an off-the-wall analysis
        b.   a totally in-your-face presentation
        c.   an over-the-top performance
        d.   that out-of-this-world feeling
        e.   an out-of-hand rejection

The expletive word class again predictably associates with a variety of unusual structures at the syntactic level. First, expletives again show unusual 'promiscuity' of syntactic

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[9]Examples here and below are from McMillan (1980).

[10]Zwicky & Pullum (1987:338) suggest that a sequence like *Semantics shemantics!* constitutes a single NP. Yet it cannot fill a normal NP slot, and constitutes a complete utterance, with topic-comment-like propositional and intonational structure: it is therefore better understood as a kind of aberrant sentence. I assume that like other expletive affixing processes, 'shm-reduplication' does not change word class; *shemantics* is then an NP functioning as predicate: the retained plural suffix is compatible with this view.

combination, occurring for example as modifiers in phrases of a variety of types (3a-d), before interjections (3d), and as VP-level modifiers (3e):

(3)   a.   you bloody rat (NP)
      b.   bloody fantastic (AdjP)
      c.   bloody fantastically (AdvP)
      d.   bloody hell!
      e.   why don't you bloody do it!

And only expletives (and one or two other highly affective terms) occur in 'imprecations' (4a); verbs of other semantic types cannot occur in this structure (4b):

(4)   a.   Stuff/Bugger/Frig (...)/Bless you!
      b.   *Hit you!/ *Ruin you!/*Praise you!/*Congratulate you!

Thirdly, and paralleling expletive infixing, expletives alone occur in various otherwise untolerated irruptions and excrescences (to use the terminology of McMillan 1980) at the phrase (5a-b) and clause (5c-d) levels:

(5)   a.   hurry friggin (/*right) up
      b.   Get the hell/fuck/*place out of here!
      c.   Where the hell/fuck/*place are my glasses?
      d.   Who the hell/fuck/*person/*name is he?

3 EXPRESSIVE DISCOURSE. Particular discourse genres in themselves license the use of marked structures. The best known example of this is in literary language, where "poetic license" effects exploit a wide variety of marked structures and marked semantic juxtapositions. Thus in 6a, from Gerard Manley Hopkins' *Windhover*, the position of the adverbial NP, apart from creating processing difficulties for the reader, would be close to ungrammatical in other discourse types, as is 6b. And semantically, 'morning's minion', like all metaphor, is incoherent if taken literally (Leech 1966), c.f. 6c.

(6)   a.   I saw this morning morning's minion
      b.   ?I read this morning the newspaper.
      c.   *I read this morning morning's newspaper

Elsewhere Manley Hopkins systematically uses a wide range of deliberate violations, such as the (non-expletive) infixing in *wind-lilylocked-laced* (*Harry Ploughman,* cited in McMillan 1980). Such violations are typical of literature, though parallel uses of marked structures occur in a variety of other discourse contexts, such as jokes, advertising and journalism (Fowler 1981, 1986, Guy 1994).

4 EXPRESSIVE PARALINGUISTIC EFFECTS. In paralinguistic contexts too a variety of marked usages signal expressive functions: emotion is signaled for example by the use of fluctuations in voice pitch and quality, as well as fluctuations in volume and speed of utterance. In written texts, contextually unexpected allographs have parallel functions; *italic fonts* and SMALL CAPITALS, for example, are used to give salience to text, to signal 'strange' or unassimilated loanwords, and to flag the use of onomatopoeia (c.f. the SENSE semantic type), swear words (c.f. the BAD type) and other exclamatory usages: all functions associated with marked structures at other levels of linguistic organization. The parallels between the uses of marked allographs and those of marked phonological structures are particularly close.

Against Long Movement in Madurese[1]

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0. Introduction

It has been claimed on the basis of Indonesian and Malay data such as (1) and (2) that long distance movement (at least across two clause boundaries) is possible in Javanic languages. Under that analysis, the *wh*-element, *siapa* 'who', binds an empty operator which moves from the most deeply embedded clause into the highest clause. Thus, in (1) and (2) there appears to be a long-distance relation between the *wh*-element and the empty position *e* in the embedded clause. [2]

(1) Indonesian

    Siapa$_i$ yang [Ali   kira [(yang) e$_i$ mem-beli mobil]]?
    who   A   think   AV-buy   car
    'Who did Ali think bought a car?'

(2) Malay (Cole & Hermon 1998 (27a))

    Siapa$_i$ [Ali   buktikan [yang e$_i$ (men-)curi   kereta]]?
    who   A   prove   that   (meng-)steal car
    'Who did Ali prove stole the car?'

Data such as (3) and (4), from Madurese and Javanese, seem to confirm this for these languages as well.

(3)   Sapa$_i$ se [Ali   kera [(jhaq/se)   e$_i$ melle   montor]]?
    who   REL A   think COMP/REL   AV.buy car
    'Who did Ali think bought a car?'

(4)   Sapa$_i$ sing [di-kira   Ali [(nek) e$_i$ tuku montor]]?
    who   REL OV-think A   COMP   buy car
    'Who did Ali think bought a car?'

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[2] Cole, Hermon, and Aman (to appear) and Paul (2000) provide evidence for the empty operator movement analysis of cleft questions for Malay and Malagasy, which extends to Madurese and, most likely, to Western Austronesian in general.

However, I will show on the basis of data from Madurese that long-distance movement may well be illusory. In fact, the Madurese data support an analysis in which the relation between the *wh*-element and the "extraction site" must be radically local; in particular, only a single clause node may intercede. I speculate on the strength of the evidence for Madurese that long-distance movement may be disallowed in all Javanic languages. Evidence from Javanese of the type I discuss for Madurese is included in an appendix. First, however, I show that if there is extraction from clauses, it must be from clausal subjects.

1. Extraction restricted to sentential subjects

The question in (3) appears to provide prima facie evidence that I am incorrect in my overall assertion. Saddy (1991) and Cole & Hermon (1998) have argued explicitly for long-distance movement in Indonesian and Malay, respectively. However, I will attempt to show that (3) does **not** provide counterevidence to my claim, but that the analysis proposed for these other languages is not tenable for Madurese.

Evidence for this comes from the interpretation of *wh*-questions. Note the asymmetry in the interpretation of the pair of sentences in (5).

(5) a. Bila   se   Siti   ngera   jhaq   Marlena   noles   buku?
     when   REL   S   AV.think   COMP   M   AV.write   book
     'When did Siti <u>think</u> that Marlena wrote the book?'
  b. Bila   se   Siti   kera   jhaq   Marlena   noles   buku?[3]
     when   REL   S   think   COMP   M   AV.write   book
     'When did Siti think that Marlena <u>wrote</u> the book?'
or   'When did Siti <u>think</u> that Marlena wrote the book?'

(5a) is a question only about the time of the thinking event, while (5b) is ambiguous, the primary interpretation being a question about the time of the writing event. The sole difference between the two sentences is the morphology on the matrix predicate *kera* 'think'—actor voice in (5a) and the bare verb form in (5b).[4]

Saddy (1991) and Cole & Hermon (1998) account for the difference in interpretation through a morphological constraint that prohibits movement of an NP across a verb with actor voice morphology (the *meng-* prefix in Indonesian and Malay). As should be noted, in the Indonesian and Malay examples in (1) and (2), the matrix verb lacks the AV prefix; both

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[3]Although (5b) is ambiguous, the interpretation in which the question pertains to the event in the embedded clause is strongly preferred.

[4]As explained below, actor voice (AV) occurs on transitive predicates in which the agent or actor is surface subject.

sentences would be ungrammatical were it to occur, as (6) and (7) show.

(6)   *Siapa yang [Ali   mengira [(yang) mem-beli mobil]]?
        who   A   AV.think   AV-buy   car
        (Who did Ali think bought a car?)

(7)   *Siapa [Ali   mem-buktikan [yang (men-)curi kereta]]?
        who   A   AV-prove   that (AV-)steal car
        (Who did Ali prove stole the car?)

Both Saddy and Cole & Hermon claim that the matrix verbs in the grammatical sentences are active and not "passive".[5]

However, I argue that these are indeed passive clauses, drawing on data from Madurese. Note that the Madurese question in (5b) is equivalent to the sentence in (8), which takes the object voice (or "passive" prefix) e-. That is, it is first a question about the writing event and secondarily a question about the thinking event.

(8)   Bila   se   e-kera   Siti jhaq Marlena noles   buku?
        when   REL OV-think   S   COMP   M   AV.write book
        'When did Siti think that Marlena wrote the book?'
or   'When did Siti think that Marlena wrote the book?'

I wish to claim that in (5b) and (8) the matrix is "passive", in the same way that the clauses in (9b) and (9c) are passive.

(9)   a. Bhurus jhuwa ngekeq Ali.
           dog   that   AV.bite A
           'The dog bit Ali.'
        b. Ali   bhurus jhuwa kekeq.
           A   dog   that   bite
           'The dog bit Ali.'
        c. Ali e-kekeq bhurus jhuwa.
           A   OV-bite dog   that
           'The dog bit Ali.'

The data in (9) illustrate the basic voice system in Madurese. Actor voice (AV) morphology occurs on the verb when the agent or actor of a transitive sentence (and some intransitives)

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[5]It is not clear that passive is the right term to use in the description of clauses in which the theme is the subject in preference to the agent or actor. However, the terminology has wide currency and is a convenient shorthand; so I use it here.

occurs as the subject, as in (9a). AV is marked by a nasal prefix or the prefix *a-*. (9b,c) are what have sometimes been referred to as passives (especially in Indonesian (Chung 1976, Kana 1986, Sneddon 1996)) . In both, a non-actor is the subject and the actor occurs either immediately preverbally in the bare verb form (9b) or postverbally in the object voice (OV) form (9c), where object voice is invariantly marked by the prefix *e-*.[6]

If the matrix clauses in (5b) and (8) are passives, they actually demonstrate extraction from a sentential subject and not a complement clause. The reason that extraction appears to be from a complement is that the sentential subject has been extraposed. Thus, I argue that (5b) has the analysis in (10).

(10)   [bila$_i$ e'$_j$ se Siti kera e$_j$] [jhaq Marlena noles buku e$_i$]$_j$

In (10), the clausal constituent *jhaq Marlena noles buku e*$_i$ originates as the complement of *kera* 'think', moves to subject position *e'*$_j$, and is extraposed to postverbal position.[7] When in subject position, *bila* 'when' (or more accurately the operator that it binds) is fronted. Although the sentence is clearly open to alternative analyses at this point, in what follows I will motivate the appropriateness of elements of (10). There are three types of evidence favoring subjecthood of the clause containing the extraction site.

1.1 Clausal complements as subjects of passives

First of all, the entire complement clause may occur as the subject of the clause, provided that the verb is in the bare form (11a) or the object voice form (11b), as demonstrated here with declarative sentences.

(11)   a.   Jhaq   Marlena noles   buku   Siti   kera.
           COMP   M   AV.write book   S   think
           'Siti thinks that Marlena wrote the book.'
       b.   Jhaq   Marlena noles   buku   e-kera   Siti.
           COMP   M   AV.write book   OV-think   S
           'Siti thinks that Marlena wrote the book.'

1.2 Verbal suffixes

Second, there are predicates that require additional verbal morphology when the sentential complement occurs in subject position. The verb *balc* 'say' takes a sentential complement, as

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[6]Additional details regarding the Madurese voice system are available in Davies 1999a.

[7]I take no position here regarding whether the extraposed clause is higher or lower in the tree structure than the *wh*-element.

in (12).

(12) Siti a-bala   [jhaq   Hasan entar ḍaq Jakarta].
      S   AV-say   COMP H   go   to   J
      'Siti said that Hasan went to Jakarta.'

When the sentential complement occurs in subject position, *bala* obligatorily takes the suffix *-aghi*, (13a); when the suffix is not present, ungrammaticality results, (13b).

(13) a. [Jhaq   Hasan entar ḍaq Jakarta] Siti bala-**aghi**.
          COMP H   go   to   J   S   say-AGHI
          'Siti said that Hasan went to Jakarta.'
      b. *[Jhaq Hasan entar ḍaq Jakarta] Siti bala.
          COMP H   go   to   J   S   say
          (Siti said that Hasan went to Jakarta.)

The data in (14) show a similar situation with the verb *kasta* 'regret'. When the suffix *-e* occurs on the predicate, the sentential complement can be the subject (14b); but when the suffix is not present, the sentence is ungrammatical, (14c).

(14) a. Ita kasta [jhaq Bambang mangkat].
          I   regret COMP B   leave
          'Ita regrets that Bambang left.'
      b. [Jhaq   Bambang mangkat] Ita kasta-**e**.
          COMP B   leave   I   regret-E
          'Ita regrets that Bambang left.'
      c. *[Jhaq Bambang mangkat] Ita kasta.
          COMP B   leave   I   regret
          (Ita regrets that Bambang left.)

The relevance of this is that it is only possible to form a question with a sentence-initial *wh*-phrase relevant to the embedded clause when the requisite "clausal subject" morphology occurs on the matrix predicate.

(15) a. *Daqrəma se   Siti bala jhaq   Hasan entar ḍaq Jakarta?
          how   REL S   say COMP H   go   to   J
          (How did Siti say that Hasan went to Jakarta?)

b. Daqrəma se Siti bala-**aghi** jhaq Hasan entar daq Jakarta?[8]
   how   REL S   say-AGHI COMP H   go   to   J
   'How did Siti say that Hasan went to Jakarta?'

Only (15b), in which the verb takes the suffix -*aghi*, is grammatical.[9] Parallel data are available with the verb *kasta* 'regret'.

(16) a. Bila   se   Ita kasta jhaq Bambang mangkat?
        when REL I   regret COMP B   leave
        'When did Ita regret that Bambang left?'
    b. Bila   se   Ita kasta-e jhaq Bambang mangkat?
        when REL I   regret-E COMP B   leave
        'When did Ita regret that Bambang left?'

(16a), which lacks the suffix, can only be interpreted as a question about the time of Ita's regret; that is, the matrix event is questioned. The complement event can only be questioned if the suffix occurs on the matrix verb, as in (16b). The obligatoriness of the additional verbal morphology in (15b) and (16b) requires an account. Given the fact that this morphology is also obligatory when the complements occur as subjects, (13a) and (14b), a reasonable hypothesis is that the complements in (15b) and (16b) are also subjects, albeit extraposed subjects.

1.3 "Control" structures

A third argument for the subject status of the complements is available based on a widespread construction involving matrix verbs. Most matrix verbs in Madurese allow an additional argument to occur provided that the argument is coreferent to an embedded pronominal element. This is illustrated for the verbs *kera* 'think' in (17) and *bala* 'say' in (18). Note that once again, *bala* must take the suffix -*aghi*.

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[8]This sentence is ambiguous between the interpretation given in (15b) in which it is a question about the event described in the complement clause and an interpretation in which it is a question about the event described in the matrix clause. As these types of questions always carry this systematic ambiguity, henceforth I will ignore the interpretation regarding the matrix event unless it is of particular relevance.

[9]To form a grammatical question in which the matrix event is questioned without the -*aghi* suffix, AV morphology is necessary on the matrix verb, as in (i).
(i)   Daqrəma se Siti a-bala jhaq Hasan entar daq Jakarta?
     how   REL S   AV-say COMP H   go   to   J
     'How did Siti say that Hasan went to Jakarta?'

(17) Siti ngera Marlena jhaq (abaqəng) noles buku.
     S   AV.think M   COMP   she   AV.write book
     'Siti thinks about Marlena that she wrote the book.'

(18) Siti a-bala-aghi Hasan jhaq (abaqəng) entar ḍaq Jakarta.
     S   AV-say-AGHI H   COMP   he   go to J
     'Siti said about Hasan that he went to Jakarta.'

In Davies (2000), I argue that there is no raising in Madurese but that *Marlena* and *Hasan* are dependents of the matrix clause and control a pronoun (usually nonovert) in the complement.[10] These additional objects can be promoted to subject, as in (19) and (20), the bare verb counterparts of (17) and (18), respectively.

(19) Marlena Siti kera jhaq (abaqəng) noles buku.
     M   S   think COMP   she   AV.write book
     'Siti thinks about Marlena that she wrote the book.'

(20) Hasan Siti bala-aghi jhaq (abaqəng) entar ḍaq Jakarta.
     H   S   say-AGHI COMP   he   go to J
     'Siti said about Hasan that he went to Jakarta.'

What is significant for present purposes is the interpretation given to questions when this additional argument occurs as the subject of the matrix clause.

(21) Bila se Marlena Siti kera jhaq (abaqəng) noles buku?
     when REL M   S   think COMP   she   AV.write book
     'When did Siti think about Marlena that she wrote the book?'

(22) Daqrəma se Hasan Siti bala-aghi jhaq (abaqəng) entar ḍaq Jakarta?
     how   REL H   S   say-AGHI COMP   he   go to J
     'How did Siti say about Hasan that he went to Jakarta?'

Importantly, (21) and (22) are questions only about the matrix predicate. Were it the case that long-distance movement was possible here, these questions should be as ambiguous as (5b) and (15b); that is, it should be possible to interpret these as questions about either the matrix event or the embedded event, with a potential preference for the embedded interpretation. We can account for the lack of ambiguity in these questions if extraction is limited to sentential subjects. In (21) and (22), the sentential complements can **never** be subjects because that position is the province of the NPs *Marlena* and *Hasan*. Since the complements are not sentential subjects, the interpretation of the *wh*-phrase is limited to the matrix predicate.

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[10] Aspects of this construction are also discussed in Davies 199a,b.

1.4 Questioning from in situ sentential subjects

A final piece of evidence for the restriction of extraction to sentential subjects comes from the fact that these questions can be formed when the sentential element still resides in subject position, as in (23-25). All of these sentences are ambiguous regarding whether it is the matrix or embedded predicate that is the focus of the question; however, as with the previous ambiguous examples, the preferred interpretation is the embedded predicate.[11]

(23) Bila se Marlena noles buku Siti kera?
     when REL M   AV.write book S think
     'When did Siti think that Marlena wrote the book?'

(24) Daqrəma se Hasan entar daq Jakarta Siti bala-aghi?
     how   REL H   go   to J   S   say-AGHI
     'How did Siti say that Hasan went to Jakarta?'

(25) Bila se Bambang mangkat Ita kasta-e?
     when REL B   leave   I   regret-E
     'When did Ita regret that Bambang left?'

Additionally, base-generated sentential subjects show the same properties that have been established for sentential complements above. This is illustrated in the following data:

(26) Jhaq Ali ng-rosaq komputer nyəngəng-aghi   Siti.
     COMP A   AV-ruin computer AV.surprised-AGHI S
     'That Ali ruined the computer surprised Siti.'

(27) Daqrəma se Ali ng-rosaq komputer nyəngəng-aghi   Siti?
     how   REL A   AV-ruin computer AV.surprised-AGHI S
     'How did that Ali ruined the computer surprise Siti?'

(28) Daqrəma se nyəngəng-aghi   Siti jhaq Ali ng-rosaq komputer?
     how   REL AV.surprised-AGHI S   COMP A   AV-ruin computer
     'How did it surprise Siti that Ali ruined the computer?'

In (27), there is a clear case of questioning an element in a sentential subject. In (28), the sentential subject has been extraposed and the interpretation is the same as (27), where there is no extraposition.

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[11]These sentences can frequently be disambiguated with appropriate intonation. However, as written with no intonational cues, they are ambiguous.

While it might seem relatively strange to claim (at this juncture) that extraction from clauses is only possible from sentential subjects, this actually brings Madurese (and other Javanic languages) into synchronicity with many languages in the Western Austronesian subgroup. Keenan (1972) has claimed for Malagasy and Kroeger (1993) for Tagalog that extraction from clauses is only possible from sentential subjects. Thus, while the analysis thus far provides no explanation for this peculiarity, it does put these languages on an equal footing.

2. Partial movement and extraposition

However, as stated above, I do not wish to leave the analysis here. Having established the relevance of subjecthood above, I now provide evidence for the claim that there is no real movement out of the embedded clause. That is, there is no long-distance movement at all in Madurese. Rather what obtains in the case of (5b) and (15b) and many other examples is so-called "partial" movement followed by extraposition of the sentential subject. I attempt to motivate this analysis below.

2.1 Partial movement

As is well-known, Western Austronesian languages have what has been characterized as "partial *wh*-movement" in which a *wh*-phrase occurs in initial position of an embedded clause yet has wide scope. As (29) shows, Madurese is no exception to this.

(29)   Siti   ngera   bila   se   Marlena noles   buku?
       S   AV.think when   REL   M   AV.write book
       'When does Siti think that Marlena wrote the book?'

Despite the fact that *bila* 'when' occurs in the embedded clause, (29) is a wide scope question, and a perfectly natural construction. (29) is synonymous with the preferred interpretation of (23), where the entire complement clause occurs as the subject rather than the object.

(23)   Bila   se   Marlena noles   buku   Siti   kera?
       when   REL   M   AV.write book   S   think
       'When did Siti think that Marlena wrote the book?'

Thus, (23) can also be analyzed as an instance of partial movement. That is, the appropriate analysis of (23) is (30), where the *wh*-phrase is still contained in the sentential subject, rather than (31), where it occurs in the matrix clause.

(30) = (23)   [[bila$_i$ [Op$_i$ se Marlena noles   buku e$_i$]]$_j$ Siti   kera e$_j$]

(31)   bila$_i$ [Op$_i$ se [[Marlena noles   buku e$_i$]$_j$ Siti   kera e$_j$]]

Following this line of thought, the appropriate analysis of (5b) is (32), where partial movement and extraposition cooccur.[12]

(32) = (5b) [[bila$_i$ e$_k$]$_j$ se Siti kera e$_j$] [Op$_i$ (jhaq) Marlena noles buku e$_i$]$_k$

The structure in (32) contains the elements of (30) and adds to it the extraposition of the constituent (k) which includes the null operator and the remainder of the complement clause.[13] (32) is to be contrasted with (33), in which the *wh*-element commands the entire sentence in syntactic structure.

(33) bila$_i$ [se [[e$_k$]$_j$ Siti kera e$_j$] [Op$_i$ (jhaq) Marlena noles buku e$_i$]$_k$]

Evidence for the partial movement/extraposition analysis is available from (i) extraposition of sentential subjects, (ii) extraposition of relative clauses, and (iii) extraposition of sentential complements with partial *wh*-movement.

2.2 Extraposition of sentential subjects

First, sentential subjects can routinely be extraposed, as illustrated in (34b) and (35b).

(34) a. [Jhaq   Marlena noles   buku] e-kera   Siti.
         COMP M   AV.write book OV-think S
         'Siti thinks that Marlena wrote the book.'
      b. E-kera   Siti [jhaq   Marlena noles   buku].
         OV-think S   COMP M   AV.write book
         'Siti thinks that Marlena wrote the book.'

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[12]Here I again leave unspecified precisely where in the structure the extraposed clause occurs inasmuch as this does not bear on present concerns.

[13]One might object that the usual state of affairs is that the relative particle *se* is used in the complementizer position of questions but in (5b,32) *jhaq* shows up as the complementizer of the extraposed sentential subject and the *se* particle is claimed to be part of the matrix clause. First off, *se* is possible in the position occupied by *jhaq* here. Second, precisely this set of complementizers (*jhaq* in the embedded clause and *se* in the matrix) occur in (i), in which the sentential subject has not been extraposed.
(i)   Bila   jhaq Marlena noles   buku   se   Siti   kera bariq.
      when COMP M   AV.write book   REL S   think yesterday
      'When did Siti think yesterday that Marlena wrote the book?'

(35) a. [Jhaq Hasan loq lolos tes-a] lecek.
      COMP H   not pass test-DEF lie
      'That Hasan did not pass the test is a lie.'

    b. Lecek [jhaq Hasan loq lolos tes-a].
      lie   COMP H   not pass test-DEF
      'It's a lie that Hasan did not pass the test.'

In fact, as is the case in English, extraposed sentential subjects are largely preferred, most likely for reasons of processing.

2.3 Extraposition of relative clauses

Second, relative clauses in Javanic languages are formed using the same strategy as focussed *wh*-questions, and relative clauses can be extraposed. A relative clause in subject position is illustrated in (36).

(36) Paket jhuwa [se e-kerem Bambang] e-bukaq Ita.
     package that   REL OV-send B   OV-open I
     'Ita opened that package that Bambang sent.'

In (36) *paket jhuwa se ekerem Bambang* 'that package that Bambang sent' is the subject of the verb in object voice, *ebukaq* 'open'. The parallel between this construction and the questions in which the sentential complement is in subject position is unmistakable. As (37) illustrates, the relative clause can be extraposed to clause-final position, leaving the head in clause-initial position.

(37) Paket jhuwa e-bukaq Ita [se e-kerem Bambang].
     package that OV-open I REL OV-send B
     'That package was opened by Ita that Bambang sent.'

It is also possible to extrapose relative clause in object position. In (38b), the modifying clause occurs sentence-finally, separated from its head, *buku*, by the PP *daq Ali* 'to Ali'.

(38) a. Marlena a-barriq buku [se Siti toles] daq Ali.
      M   AV-give book REL S   write to   A
      'Marlena gave the book that Siti wrote to Ali.'

    b. Marlena a-barriq buku daq Ali [se Siti toles].
      M   AV-give book to A   REL S   write
      'Marlena gave the book to Ali that Siti wrote.'

2.4 Extraposition of sentential complements

The final piece of evidence for the partial movement/extraposition analysis comes from sentential complements. As illustrated above in (29), partial movement with wide scope interpretation is possible with sentential complements. In the same way that relative clauses in object position can be extraposed and thus separated from their heads, sentential complements can be separated from a *wh*-phrase, as in (40).

(39) ?Biq telpon   Siti a-bala-aghi   **daqrəma** [se Marlena ng-rosaq komputer
      daq Ali] ?
      with telephone S   AV-say-AGHI how   REL M   AV-ruin computer
      to A
      'How did Siti tell Ali by telephone that Marlena ruined the computer?'

(40) Biq telpon   Siti a-bala-aghi   **daqrəma** daq Ali [jhaq/se   Marlena
      ng-rosaq komputer] ?
      with telephone S   AV-say-AGHI how   to A   COMP/REL M
      AV-ruin computer
      'How did Siti tell Ali by telephone that Marlena ruined the computer?'

The sentence in (39) is only marginally acceptable due to the heavy nature of the complement clause in relation to the following PP.[14] However, it serves as the basis for comparison with the completely acceptable (40). In (40), the *wh*-element *daqrəna* 'how' precedes the PP *daq Ali* 'to Ali' and the sentential complement follows. In both (39) and (40) it is unambiguously the event in the embedded clause which is the focus of the question, as the matrix clause already includes a manner adverbial, the instrumental PP *biq telpon* 'by telephone'.

If the analysis is correct, this predicts that it should be possible to extrapose a sentential subject that includes a partially moved *wh*-phrase in its initial position. As (41) shows, this is correct.

(41) Nyəngəng-aghi   Siti daqrəma se   Ali ng-rosaq komputer?
      AV.surprise-AGHI S   how   REL A   AV-ruin computer
      'How did it surprise Siti that Ali ruined the computer?'

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[14]Preferable to (39) is (i), in which the heavy constituent is shifted to clause-final position.
(i)   Biq telphon   Siti a-bala-aghi   daq Ali daqrəma se   Marlena
      ng-rosaq komputer?
      with telephone S   AV-say-AGHI to A   how   REL M
      AV-ruin computer
      'How did Siti tell Ali by telephone that Marlena ruined the computer?'

44

3. Conclusion

The foregoing data lend plausibility to an analysis of Madurese cleft questions which rejects all long distance movement in favor of a radically local relation. The natural question to ask is whether this is a desirable move. Is anything gained under the proposed analysis? I would claim that there is. If we leave aside the proposal that all *wh* constructions are radically local, we are left with the fairly convincingly established fact that all extraction from clauses must be from sentential subjects. While this accords with observations about other Western Austronesian languages, this condition in and of itself is relatively unusual—certainly not what would be expected given what we know of the world's languages in general. Attempts to explain the restriction of movement to sentential subjects in various Austronesian languages frequently wind up relatively complex and largely mere descriptions of the facts. Adoption of the present proposal eliminates the need for any arcane machinations and perhaps makes the affected languages seem a little less unusual.

The "partial" movement aspect of the proposed analysis is, of course, needed in any event, so its inclusion adds nothing to the grammar of Madurese. Therefore, in some respects restriction to radical locality results in a simpler grammar. What goes begging, obviously, is any explanation for why these A-bar relations should be restricted in this way. I have no good explanations for this at this juncture. My speculations run along the following lines: if it turns out that the partial movement/extraposition story would work somehow for all these 'sentential subject' languages, then one might look to the voice system for an explanation since all these languages have rich voice systems. On the other hand, if it is just the Javanic languages that are open to this kind of analysis, we might take the results that we find in the "control" construction to be indicative of some larger constraint in the language against inter-clausal movement.[15] The absence of long-distance movement then follows naturally. What remains is to find what aspect of Madurese grammar drives this restriction.

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[15]In Davies 2000, I provide evidence on the basis of Cebuano that the same type of restriction against inter-clausal movement may actually obtain in the Philippine languages as well. If this speculation/result holds up, it might be that all (or most) of the languages with the restriction on extraction from clauses to subject clauses are open to the same explanation as Madurese.

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Appendix: Javanese

Javanese cleft *wh*-questions show the same attributes as the Madurese. The data included below parallel the Madurese data discussed in the main text, and the same arguments can be made as were made on the basis of Madurese. Following the number of the Javanese example is the Madurese example that it is related to.

(J1) = (5a) Kapan sing Siti ngira nek Marlena nulis buku?
            when REL S AV.think COMP M AV.write book
            'When did Siti think that Marlena wrote the book?'

(J2) = (8) Kapan sing di-kira Siti nek Marlena nulis buku?
          when REL OV-think S COMP M AV.write book
          'When did Siti think that Marlena wrote the book?'
    or 'When did Siti think that Marlena wrote the book?'

(J3) = (11b) Nek Marlena nulis buku sing di-kira Siti.
            COMP M AV.write book REL OV-think S
            'That Marlena wrote the book was thought by Siti.'

(J4) = (12) Siti kandha nek Ali ng-antem asu.
          S say COMP A AV-hit dog
          'Siti said that Ali hit the dog.'

(J5) = (13a) Nek   Ali   ng-antem asu   di-kandha-kna Siti.
               COMP   A   AV-hit   dog   OV-say-KNA   S
               'Siti said that Ali hit the dog.'

NB: In these data (from Surabayan Javanese), -(k)na is equivalent to Madurese -aghi. In Central Javanese this is realized as -(k)ake, while still other speakers use -(k)ne.

(J6) = (13b) *Nek   Ali   ng-antem asu   di-kandha Siti.
               COMP   A   AV-hit   dog   OV-say   S
               (Siti said that Ali hit the dog.)

(J7)   Piye sing Siti   kandha nek   Ali   ng-antem asu?
        how REL S   say   COMP A AV-hit   dog
        'How did Siti say that Ali hit the dog?'

NB: This is grammatical in Javanese since kandha usually occurs without AV morphology. However, this is a question about the saying event not the hitting event.

(J8) = (15b) Piye sing di-kandha-kna   Siti   nek   Ali   ng-antem   asu?
               how REL OV-say-KNA   S   COMP A   AV-hit   dog
               'How did Siti say that Ali hit the dog?'

(J9) = (18)   Siti   ngandha-kna   Ali   nek   (dheweke) ng-antem   asu.
            S   AV.say-KNA   A   COMP he   AV-hit   dog
            'Siti said about Ali that he hit the dog.'

(J10) = (20) Ali   di-kandha-kna   Siti   nek   (dheweke) ng-antem   asu.
             A   OV-say-KNA   S   COMP   he   AV-hit   dog
            'Siti said about Ali that he hit the dog.'

(J11) = (22) Piye sing Ali   di-kandha-kna   Siti   nek   (dheweke) ng-antem   asu?
             how REL A   OV-say-KNA   S   COMP   he   AV-hit   dog
            'How did Siti say about Ali that he hit the dog?'

(J12) = (23) Kapan sing Marlena nulis   buku   di-kira   Siti?
            when REL M   AV.write book   OV-think S
            'When did Siti think that Marlena wrote the book?'

(J13) = (26) Nek   Bambang mangkat nyosah-na   Ita.
            COMP   B   leave   AV.sad-KNA I
            'That Bambang left made Ita sad.'

47

(J14) = (27) Kapan sing Bambang mangkat nyosah-na Ita?
when REL B leave AV.sad-KNA I
'When did that Bambang left make Ita sad?'

(J15) = (28) Kapan sing nyosah-na Ita nek Bambang mangkat?
when REL AV.sad-KNA I COMP B leave
'When did it make Ita sad that Bambang left?'

(J16) = (34b) Di-kira Siti nek Marlena nulis buku.
OV-think S COMP M AV.write book
'Siti thinks that Marlena wrote the book.'

(J17) = (36) Buku iku [sing di-tulis Marlena] di-waca Siti.
book that REL OV-write M OV-read S
'That book that Marlena wrote was read by Siti.'

(J18) = (37) Buku iku di-waca Siti [sing di-tulis Marlena].
book that OV-read S REL OV-write M
'That book was read by Siti that Marlena wrote.'

(J19) = (39) Karo telpun Siti ngandha-kna piye sing Ita lunga nang Jakarta
nang Ali?
with telephone S AV.say-KNA how REL I go to J
to A
'How by telephone did Siti say to Ali that Ita went to Jakarta?'

(J20) = (40) Karo telpun Siti ngandha-kna piye nang Ali {nek/sing}
Ita lunga nang Jakarta?
with telephone S AV.say-KNA how to A COMP/REL
I go to J
'How by telephone did Siti say to Ali that Ita went to Jakarta?

Vowel shifting and cloning in Motlav :
historical explanation vs. formal description

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Abstract

In his first account of Motlav grammar, Codrington (1885), followed by Kasarhérou (1962), described the phonological rule of 'vowel shifting' : a number of prefixes change their vowel into that of the next lexeme, e.g. *na-* + *vôy* > *nô-vôy* ('volcano'). We first show that this rule only accounts for half of the lexicon, namely CV- roots, whereas for CCV-roots no change occurs, leaving an unvarying vowel instead.

We then discuss a diachronic hypothesis in order to account for these two distinct sets of lexemes: stress rules in former stages of the language first brought about a morphological alternation between two kinds of roots (CV- vs. CCV-). Eventually, this alternation was reinterpreted as reflecting a phonological constraint just emerging from inherited forms; as a consequence, the whole system is currently undergoing some standardization.

Finally, we provide a synchronic reanalysis of these recently emerged rules, thanks to newly defined theoretical tools. For instance, our choice of a multi-linear approach allows us to take into consideration the notion of 'floating phoneme', in order to account for the behavior of these prefixes ; and the same notion appears to be efficient in analyzing 'vowel transfer' (e.g. *na-* + *hinag* > *ni-hnag*), another phonological rule of the same language.

Motlav is an Oceanic language spoken in northern Vanuatu (Banks Is), on the island of Motalava, by approximately 1800 speakers[1]. It is geographically and historically close to Mota, a more conservative language which was first described in detail by Reverend Codrington (1885; 1896); this author also gave a first account of the grammar of Motlav (1885: 311-323).

Contrary to Mota, the morphology of Motlav is quite difficult, and seems to obey complex segmental and phonotactic rules, leaving bundles of lexical exceptions. Our aim is to show that this apparent complexity may in fact be reduced to a small set of rules and constraints, which mostly affect the quality and position of vowels within the word.

Yet, such a simplification of the analysis requires some strengthening or redefinition of our theoretical tools, which form the framework of our analysis: we will then come across such notions as syllabic template, floating vowels, and hierarchy of cognitive operations.

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[1] An earlier but more detailed version of this article was published (François 1999), relating the morphology of vowels in Motlav to dictionary-making issues.

1. Phonological outline of Motlav

1.1 Consonants

Motlav contains 16 distinct consonants, which may appear in any position of the linguistic chain – i.e. syllable-initial or final. Their phonological value is given below, together with their spelling when it is not obvious.

	labiovelar	bilabial	alveol.	velar	glottal
voiceless stops	^{k}p^w |q|		t	k	
prenas. voiced stops		^{m}b |b|	^{n}d |d|		
fricatives		v	s	ɣ |g|	h
nasals	^{ŋ}m^w |m̂|	m	n	ŋ |n̂|	
lateral			l		
glides	w		j |y|		

This information is being given here for the reader's convenience; but it may be useful to underline the fact that, synchronically speaking, there is no morphological rule in Motlav involving the quality or position of consonants, such as assimilation.

Let us only underline the fact that the two glides /w/ and /y/ strictly behave as consonants in this language : they never form diphthongs, and follow the same rules as other Cs when filling in the syllable template. Note also that the phoneme /v/ surfaces as [p] at the end of a syllable, and this phonetic allophone[2] is spelled *p* in the orthography: e.g. *na-pnô* 'country' corresponds phonologically to /na-vnô/.

1.2 Vowels

However complex the rules involving vowels may be, the vowel system in itself is quite simple, since it contains no diphthongs, nor long or nasalized vowels, but instead seven oral, short vowels, represented below.

```
 i            u
 ɪ |ê|    ʊ |ô|
     e    o
         a
```

Codrington (1885: 311) only mentioned six vowels, while other analyses (Crowley forthc.; Kasarhérou 1962) proposed a seven-element system, but with different vowel qualities. In another article (François 1999: 443), we have claimed that the two mid-high vowels should be better described as being [-ATR], both on phonetic and phonemic grounds: the [ATR] feature is involved in the morphological process of vowel harmonization, which we will not deal with here.

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[2] In his grammar sketch of Motlav ("Mwotlap"), Terry Crowley (forthc.) considers the phoneme /p/, although it shows no phonological contrast with /v/.

1.3 Phonotactics

Motlav only accepts one type of syllabic pattern, i.e. I(C)V(C)I. Since both consonants are optional here, the phonology of Motlav actually contains four patterns: V, CV, VC, CVC; but the essential point here is to underline that there is no allowance for consonant clusters within a syllable, and that $-C_1C_2-$ sequences may only show at the syllable boundary.

As a consequence, a CCV- morpheme will only surface as such if its first consonant can attach to a preceding open-syllable (CV-) prefix. For example, the radical *mtiy* 'sleep' will stay unchanged in *ni-mtiy* '(s/he) sleeps', because it may be segmented into two CVC syllables Inimltiyl; whereas an unprefixed form, as the one for imperative 'Sleep!', will have to undergo a process of vowel epenthesis, with the vowel of the radical cloning between the first consonant cluster: **mtiy → Mitiy!*, segmented Imiltiyl. We won't detail this rule here[3], but understanding it gives a first notion of the kind of phonotactic constraints defining Motlav morpho-phonology.

We can characterize the notion of phonological *word* in Motlav, as a segmental unit including one or several morphemes, which are together bound to a strict [CVCI... ICVC] pattern. Incidentally, this definition makes it possible to distinguish *prefixes* from *clitics* on phonological grounds : a <u>prefix</u> is integrated to the phonological word, and as such takes its position inside the syllabic pattern thus defined – e.g. *le-* is a prefix in /le-plnôl/ 'in the country', without epenthesis. Whereas a <u>clitic</u> only integrates into the *stress-defined* word[4], but never into the *phonotactic* word: e.g. *ne* is a clitic in /nellvôlnôl/ 'of the country', because it remains without the word boundary defined on phonotactic grounds.

2. Distribution of vowels within the word

The four main phonological rules involving vowels in Motlav are designated below:

VOWEL HARMONIZATION:	*iplu-k* 'my fellow' → *êplô-n* 'his fellow';
VOWEL EPENTHESIS:	*mtig → mitig* 'coconut';
VOWEL SHIFTING:	*na-* + *wôl → nô-wôl* 'moon';
VOWEL TRANSFER:	*na-* + *hinag → ni-hnag* 'yam'.

The first two rules have already been alluded to, and won't be detailed here; this paper will deal mostly with vowel shifting, and will eventually present the operation of vowel transfer (§5).

2.1 Evidence for vowel shifting

The phenomenon of vowel shifting was first acknowledged by Codrington (1885: 311), and focused upon by Jacqueline Kasarhérou (de la Fontinelle), in her short presentation 'Les changements vocaliques de trois préfixes en motlav' (1962). Both authors presented this rule as involving a series of prefixes consisting of one single consonant (C-): e.g. the noun article *n-*, the verbal prefix *n-* (considered by Kasarhérou to be the same as the article), the perfect marker *m-*, would either surface as such (C-) before a root beginning with a V, or else would borrow their vowel from the root, through a cloning / shifting operation :

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[3] See François (1999: 475-479).

[4] Motlav words receive stress on their last syllable: see fn.9.

Table 1 - *Rules for vowel shifting, with noun article* n-

radical	*n- + radic.	radical	article+rad.	meaning
V_i-	n-V_i-	ulsi	n-ulsi	summit
CV_i-	nV_i-lCV_i-	bê	nê-bê	water
CCV_i-	nV_i-ClCV_i-	qti	ni-qti	head

Further evidence of this phenomenon include the following items, among thousands. The first rows involve the noun article (supposedly *n-*), the last one uses a numeralizer of the form *v-* :

Table 2 - *Sample evidence for vowel shifting*

ni-git	louse	nê-sêm	money	ne-qet	taro
no-gom	disease	nô-vôy	volcano	nu-kumay	sweet potato
na-lañ	(a) fly	ni-qti-k	my head	nê-qtê-n	his head
vô-yô	two	ve-vet	four	vê-vêh	how many ?

This insertion of a shifted vowel can be analyzed as an epenthesis rule to avoid consonant clusters at the beginning of a word. This is exactly what happens with another of the phonological rules in Motlav, which we have labeled 'vowel epenthesis': a CCV- root like *mtig* 'coconut' needs to copy its vowel into the consonant cluster, to avoid it at the beginning of a word (*mtig* → *mitig*). This recalls also what happens in Kalam, a non-Austronesian language from Papua New Guinea (Pawley 1993: 91):

> In the context C_CVC, the release vowel may be a very short, unstressed near copy of V or a short, unstressed central or high central vowel, e.g., *mlep* 'dry' is [meɫép] or [miɫép].

In Motlav, no central vowel is heard, and the epenthetic vowel is always clearly a clone of the following V. These prefixes "seem not to have a proper vowel, but instead to borrow it from the radical" (Kasarhérou 1962). This evidence should suffice for positing suffixes of the form C-, i.e. with a single consonant, and no specific vowel.

2.2 Exceptions to vowel shifting

Despite the obviousness of the latter analysis, we have to face a quantity of irregular forms, whose prefix vowel is different from that of the radical. A few of them are presented in *Table 3*, where irregular forms are underlined:

Table 3 - *Some exceptions to vowel shifting*

+ article	meaning	+ locative	meaning
na-naw	sea	le-naw	in the sea
na-sm̂al	sea	le-sm̂al	in the rain
na-he-k	my name	le-he-k	in my name
na-gmel	men's house	le-gmel	in the men's house
na-lo	sun	le-lo	in the sun
na-pnô	country, island	le-pnô	in the country

We have chosen only a few radicals among those which show at least one irregular form; each radical is presented here with two different prefixes, the noun article *n-* and the loca-

tive preposition *l-*. A regular pair for both prefixes would be *nô-vôy* 'volcano' – *lô-vôy* 'on the volcano'. *Table 3* does show regular forms too, like *na-naw* or *le-gmel*; but the rest is not, and falls among the 'exceptions' pointed at by both Codrington and Kasarhérou.

The trouble is, such 'exceptions' are not few, but represent up to 50% of the data. Such observation obviously needs to be accounted for, unless the rule for vowel shifting appears to be just a weak random trend in Motlav phonology. In fact, another sort of regularity appears in *Table 3*, provided it is not read in rows, but in columns. For a given prefix, all the irregular forms will show the same vowel; e.g. every noun preceded by the article *n-*, will have as a first vowel either a copy of the radical vowel (e.g. *nô-vôy*), or the vowel /a/ (e.g. *na-gmel*, *na-lo*); as for the locative *l-*, the 'default vowel', as it may be called, is an /e/ (e.g. *le-naw*, *le-lo*).

2.3 *Shifting prefixes* vs. *unvarying prefixes*

Evidently, Motlav does not have just one neutral vowel which could be assigned at the system-level, like Indonesian Pendau does with /o/ (Quick 2000); instead, each shifting prefix is provided with its own 'default vowel'. The quality of this vowel is assigned to the prefix in the lexicon, and cannot be predicted through any phonological rule: it is thus necessary to represent it in the citation form of each morpheme. From now on, we will choose to speak about the noun article *na-* or the locative preposition *le-*, instead of *n-* and *l-* respectively, since this is the only way to know what their default vowel is. This is a first difference with former accounts which were given of Motlav phonology, since we now consider shifting prefixes to be of the form CV-, with both C and V being specific.

Nevertheless, one improvement has to be made in our representation of these CV-prefixes. Talking about an article *na-* would make it necessary to posit an extra rule of deletion / assimilation for this /a/ before certain radicals, e.g. *na-* + *qôñ* → *nô-qôñ* 'night'. This rule would have a form like

$$< C_0V_0\text{-} + C_1(C_2)V_1C_3... \rightarrow C_0\boxed{V_1}\text{-}C_1(C_2)V_1C_3... >$$

However, an argument against such a generalization is given by other prefixes of the form (C)V-, which never change their vowel:

- verb prefix *ni-* (3rd singular + present): e.g. *ni-in* 'drinks', *ni-et* 'sees', *ni-van* 'goes', *ni-gen* 'eats', *ni-qôñ* '(it) becomes night';
- locative prefix *a-*, showing in several place names: *a-Pnôlap* 'Vanua Lava', *a-Gô* 'Gaua', *a-M̂ew* 'Maewo', *a-M̂sên* 'Mosina', *a-M̂ot* 'Mota'.

As a consequence, vowel shifting in Motlav cannot be described by the general rule stated above. Some CV- prefixes are unvarying, while others do show a 'weak' vowel, which is likely to assimilate to the vowel of the radical. This is why the best representation is to oppose these two kinds of CV- prefixes, typographically, by contrasting:

- prefixes of the form /CV-/ which never shift their vowel, e.g. *ni-* (3SG:PST); they will be called 'unvarying prefixes';
- prefixes of the form /CV-/, which are sensitive to vowel shifting, e.g. *nA-* (noun article); they are the 'shifting prefixes'.

The uppercase letter codes for the special status of this 'default vowel', i.e. a vowel which sometimes surfaces and sometimes does not; the exact theoretical status of this vowel will be the main issue of §4. Motlav has eight shifting prefixes, which are listed below:

Table 4 - *The eight vowel-shifting prefixes of Motlav*

FORM	MEANING	PREFIXED TO
nA-	Article ('a / the')	
bE-	Purposive ('for')	nouns
lE-	Locative ('in')	
mE-	Perfect	verbs,
nE-	Stative	adjectives,
tE-	Future	(nouns)
tE-	Ablative	locatives
vE-	Numeralizer	numbers

Incidentally, notice that some of these prefixes can combine. This is mainly the case for *tE-* ('Ablative'), which is prefixed to locative words, be they directly locative –e.g. *to-M̂otlap* 'from Motalava'–, or derived by means of the preposition *lE-* ('Locative'), thus bringing about a sequence *tE-lE-*. In this case, the preposition which is adjacent to the root (*lE-*) is sensitive to vowel shifting, and its vowel is always reproduced on the first prefix (*tE-*):

$$tE\text{-} + lE\text{-} + \hat{e}\hat{m} \rightarrow t\hat{e}\text{-}l\text{-}\hat{e}\hat{m} \quad \text{'from the house'}$$
$$tE\text{-} + lE\text{-} + v\hat{o}y \rightarrow t\hat{o}\text{-}l\hat{o}\text{-}v\hat{o}y \quad \text{'from the volcano'}$$
$$tE\text{-} + lE\text{-} + naw \rightarrow te\text{-}le\text{-}naw \quad \text{'from the sea'}$$

At this stage of the presentation, it is impossible to know whether the vowel /e/ on the first prefix (*te-*) is an instance of its own 'default vowel' –which would mean that no vowel shifting occurred at all–, or if it is a copy of the following vowel –which means that vowel shifting only affects the second prefix (*lE-*). Further demonstration will show the second assumption to be correct.

2.4 *Permeable* vs. *blocking lexemes*

One of the conditions for vowel shifting, obviously, is that the prefix must belong to the limited list of shifting prefixes (*Table 4*). But what about the radical? Is there any restriction on the set of radicals that can shift their vowel, and is that restriction systematically predictable?

Table 3 above had already provided a set of exceptions to the vowel-shifting process. However, only the underlined forms (e.g. *le-naw*) were supposed to be irregular, while other forms, including for the same radical (e.g. *na-naw*), were considered to follow the rules. But now that we know the underlying form of each prefix, it becomes ambiguous whether the first /a/ in *na-naw* is really a clone of the vowel in the radical (*naw*), or if it is the default vowel of the noun article (*nA-*). Now, there is strong evidence pointing at the latter solution: *whenever a given lexical root blocks the vowel-shifting process with one prefix, it does so with all other prefixes.* Conversely, whenever a lexeme shifts its vowel to one prefix, it will do so with any other (shifting) prefix. *Table 5* gives further evidence of this claim:

Table 5 - *Permeable* vs. *blocking lexemes*

	trans.	bare root	article *nA-*	Pp *bE-* for	Stative *nE-*	Perfect *mE-*
permeable lexemes	cold	*momyiy*	*no-momyiy*	*bo-momyiy*	*no-momyiy*	*mo-momyiy*
	night	*qôñ*	*nô-qôñ*	*bô-qôñ*	*nô-qôñ*	*mô-qôñ*
	think	*dêmdêm*	*nê-dêmdêm*	*bê-dêmdêm*	*nê-dêmdêm*	*mê-dêmdêm*
blocking lexemes	work	*mgumgu*	*na-mgumgu*	*be-mgumgu*	*ne-mgumgu*	*me-mgumgu*
	sleep	*mtimtiy*	*na-mtimtiy*	*be-mtimtiy*	*ne-mtimtiy*	*me-mtimtiy*
	want	*myôs*	*na-myôs*	*be-myôs*	*ne-myôs*	*me-myôs*

This means that all lexical items of Motlav, without exception, fall into either of two morphological categories, defined in relation with the vowel-shifting process. It is a '*permeable*' lexeme, if it allows its first vowel to be copied onto the preceding shifting prefix: e.g. *qôñ → nô-qôñ, bô-qôñ, mô-qôñ*, but never **na-qôñ*. Conversely, a lexeme will be labeled '*blocking*' if it is incompatible with vowel shifting; in this particular case, the prefix can only take its own default vowel: e.g. *myôs → na-myôs, be-myôs, me-myôs*, but never **nô-myôs*. The feature [permeable] *vs.* [blocking] is carried by each lexeme in the lexicon – unless it can be predicted by the theory; the latter issue will be discussed in 2.5.

At this point of the discussion, two remarks may be made. First, this rule definitely helps answer the question about the nature of the vowels in a word like *na-naw* 'sea' (*Table 3*). Since we are no longer dealing with irregular 'forms', but with irregular lexemes, then a word like *le-naw* 'in the sea', which has blocked the vowel-shifting process, proves the root *naw* belongs to the set of 'blocking lexemes'; as a consequence, the *a* of the article on *na-naw* cannot be due to vowel assimilation, and is necessarily an instance of the default vowel of the prefix. The same logic applies to another ambiguous form like *le-gmel* 'in the men's house': since the test with the article *nA-* gives *na-gmel* instead of **ne-gmel*, then it becomes obvious that the root *gmel* is blocking, and that the first *e* in *le-gmel* comes from the prefix itself. Thanks to this test, all the ambiguous forms of Motlav can easily be solved.

Second point: only blocking lexemes can show the underlying form of each prefix; and this turns out to be essential even to morphosyntactic analysis, since they help distinguish between the noun article *nA-* and the stative prefix *nE-*. As is clear in *Table 5*, these two prefixes always have the same surface forms when they are combined to permeable roots. This point led J. Kasarhérou to a confusion, when she presented a prefix *n-* as an "actualizing prefix" ('préfixe actualisant') which is "compatible with all full words of this language", regardless of their syntactic category. In fact, deeper morphological evidence reveal that there are two distinct morphemes, one of which is compatible exclusively with nouns (*nA-*), whereas the other mainly goes with adjectives and stative verbs (*nE-*). Far from challenging the noun-verb opposition, this pair of prefixes confirms that it is quite strong in Motlav[5].

2.5 Is the [blocking] feature predictable?

In summary, we have demonstrated that the process for vowel shifting only occurs in one case, i.e. the combination of a permeable lexeme + a shifting prefix:

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[5] *Table 4* suggests that *nE-* is also compatible with nouns, though this is only true of a dozen items. On the other hand, the fact that all nouns be predicative (if they bear the article *nA-*) is not a sufficient argument to say that verbs and nouns are not separated in Motlav; and the existence of a few 'precategorial roots' like the ones presented in *Table 5* (e.g. *qôñ, myôs...*) is not a good argument either, as long as the major part of the syntax continues to contrast nouns and verbs.

Table 6 - *Combination <permeable lexeme + shifting prefix>*

	blocking lexeme (°*myôs*)	permeable lexeme (*qôñ*)
unvarying prefix (*ni-*)	– (*ni-myôs*)	– (*ni-qôñ*)
shifting prefix (*mE-*)	– (*me-myôs*)	+ (*mô-qôñ*)

Now, the next question would be to find out whether this feature of the lexeme [blocking] *vs.* [permeable] is predictable from the form of the root, or not. This would make it clearer whether vowel shifting belongs to the domain of phonology –if it is predictable– or of morphology –if it is not. A first answer to our question is 'No', i.e. the form of a root is not sufficient to predict with certainty if it will shift its vowel or not. The evidence for this claim is the following (morphological) minimal pair:

– *nê-lêt* 'pudding': permeable lexeme /*lêt*/
– *na-lêt* 'firewood': blocking lexeme /°*lêt*/.

Two homophonous roots /*lêt*/ show two divergent behaviors in relation with vowel shifting: one is permeable, while the other belongs to the set of blocking lexemes. Although there are few minimal pairs like this one, it should be enough evidence to draw the following conclusion: *It is not 100% possible to predict the feature [± blocking] from the root itself; its value is assigned to each root within the lexicon.* In our presentation of Motlav lexemes, a blocking root will be preceded with a small symbol (°).

However, though there may not be a systematic rule for this prediction, we can find at least a very strong tendency in Motlav lexicon. It appears that permeable lexemes are generally roots *beginning with only one consonant*, whereas blocking lexemes normally *begin with two*. *Table 7* illustrates this contrast between 'CV roots' and 'CCV roots':

Table 7 - *Regular correlation between root structure and vowel shifting*

permeable lexemes: CV-		blocking lexemes: CCV-	
wis	owl	°*dyê*	wait
lêt	pudding	°*twoyig*	easy
siseg	play	°*myôs*	want
vêytitit	fight	°*mtig*	coconut
yô	two	°*vnô*	country
vap	say	°*hyo*	long
M̂otlap	Motalava	°*blekat*	play cards

This table means that all CV- roots (first column) are regularly permeable, i.e. allow their first vowel to copy onto the prefix: e.g. *ni-wis* 'owl', *vô-yô* 'two', *to-M̂otlap* 'from Motalava'; conversely, CCV- lexemes normally block the process of vowel shifting, thus being always associated with the default vowel of the prefix: e.g. *nE-* + °*twoyig* → *ne-twoyig* 'is easy'; *nA-* + °*vnô* → *na-pnô* 'country, island'.

2.6 A new sort of exceptions

This list could go on with thousands of lexemes: the tendency we have just mentioned is true for 100% of the verbs, adjectives and numerals, and about 95% of the nouns. In this

case, it makes sense to speak about a phonological *rule*, for which there are a certain number of exceptions (< 5% of the nouns). But it must be clear that we are not following the same logic as previous authors, such as Codrington and Kasarhérou, who considered as 'exceptions' all roots which did not shift their vowel. These roots, which represent half of the lexicon, are now integrated in a newly-defined rule, under the name of 'blocking roots'.

Now, what we consider to be exceptions, is a much smaller set of nouns, which do not correspond to the correlation between phonotactic structure of the root (CV- *vs.* CCV-) and compatibility with vowel shifting. These exceptions can be either permeable roots, which have the unexpected form CCV- (a dozen nouns); or blocking roots, which start with only one consonant (up to forty nouns). The most common of these irregular lexemes are presented in *Table 8*:

Table 8 - *A few exceptional nouns: CCV- permeable & CV- blocking roots*

permeable lexemes: CCV-		blocking lexemes: CV-	
qti-	head	°he-	name
vni-	skin	°lo	sun
qn̂i-	destiny	°lêt	firewood
tqê	garden	°tô	mountain
n̂yun̂yu-	snout	°yen̂	turmeric
blêit	plate	°hôm̂	Wrasse fish
skul	school	°lo-	inside

For instance, the word for 'garden' *tqê*, with the article *nA-*, does not give the expected **na-tqê*, but an unpredictable form *nê-tqê*; in the other direction, the word for 'mountain' is not **nô-tô*, as would be normal for a CV- root, but *na-tô*. Incidentally, we notice that among the morphological pair *nê-lêt / na-lêt* mentioned above, the first root is regular, whereas the second one belongs to the set of exceptional blocking lexemes (see *Table 8*).

The origin of most of these exceptions will be discussed in §3.3. What we would like to develop right now, is a historical hypothesis which would account for the major morphological split between permeable and blocking roots, and for its regular correlation with phonotactic structure. After this diachronic approach, we will focus on a synchronic representation of vowel shifting in Motlav.

3. A diachronic account for vowel shifting in Motlav

3.1 Historical stress and syllable loss in Motlav

The question is: what historical processes can account for vowel shifting in Motlav; and especially, why do CCV- roots systematically block this rule, while only CV- roots allow it? To answer this question, it is useful to remember that former linguistic stages of Motlav followed Proto Oceanic in having mainly open syllables of the form (C)V (Ross 1998: 17). The closed (CVC) syllables of Motlav are obviously an innovation, and were evidently formed through the loss of unstressed vowels. Basic stress rules of pre-Motlav included a primary stress on the penultimate syllable of the phonological word, and secondary stresses on every second syllable towards the left of the word, e.g. **M̂ótaláva*.

In more recent times, all post-tonic syllables were deleted, causing closed (CVC) syllables to appear. Here are a few place names:

*M̂ótaláva	> M̂otlap	'Motalava island'
*á-Lakóna	> Alkon	'Gaua island'
*á-Ravéña	> Ayveñ	'Ravenga islet'
*á-M̂osína	> Am̂sên	'Mosina village'
*á-Valúwa	> Aplôw	'Valuwa village'
*á-Vanúa-láva	> Apnôlap	'Vanua Lava island'

These examples show how words with four open (CV) syllables were eventually reduced to two closed (CVC) syllables, or from six to four. Other words shorten from two to one syllable (*CVCV > CVC); other cases will be discussed below. In all these examples, only stressed syllables were retained in Motlav, while unstressed post-tonic vowels were definitely lost.

3.2 Historical stress and vowel shifting

Now, as far as prefixes are concerned, there were two possibilities. In a given prefixed word, either the stress would strike this prefix, or it would strike the following syllable – in which case the prefix would be in a pre-tonic position. The first case can be illustrated by a phrase in Pre-Motlav meaning '(the) country', *ná vanúa (< POc *panua); in Motlav we have:

*ná vanúa   > na-pnô   'country, island, village'

This example shows that when the prefix was accented, it maintained the quality of its own vowel, without any copy occurring: in modern Motlav, this corresponds to what we have been calling the 'default vowel' of the prefix. On the other hand, since the first vowel of the radical was in a post-tonic position, it regularly lost its vowel, thus defining a new root of the form CCV-. This hypothesis is the most powerful to explain why CCV- roots systematically block the process of vowel shifting: the genesis of such roots implied necessarily a stressed prefix, and hence no vowel assimilation at all.

The second case, i.e. the unstressed prefix, occurred whenever the phonological word (including the prefix) had an odd number of syllables, e.g.

*na vánuá-na   > nê-vêna-n   'his country[6]'

In this situation, the stress on the first syllable of the root (*-va-) caused it to survive in the modern form (-vê-)[7], and this evolution is the origin of all CV- roots in Motlav. On the other hand, the unstressed (pre-tonic) vowel of the prefix, after maybe becoming a schwa, proved its articulatory weakness in assimilating totally to the next syllable. Notice that the total deletion of the prefix vowel (*nvênan) was impossible, because of the phonotactic

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[6] Notice that these two words are considered by speakers to be totally distinct from one another; the translation of 'his country' uses now the alienable pattern na-pnô no-no-n, and the word nê-vêna-n is a poetic word for 'his fatherland'. We have discovered up to eight etymological 'doublets' of this kind in Motlav (François 1999: 456), all of which are opaque to the speakers.

[7] The syllable itself remains, but the quality of the vowel may change, according to the one in next syllable. Among the many possib'e combinations, our examples involve *á_u > ê (word-internally), *á_u > e (word-finally); *á_i > e; *ú_a > ô; *ú_e > ô; *ú_i > i; *í_a > ê; *í_o > ê.

rules applying in Motlav (see §1.3). In a way, vowel shifting could be considered as a special case of vowel epenthesis involving prefixes: an underlying form like *n-vêna-n surfaces as nê-vêna-n, following *mtiy → mitiy 'sleep'.

Further evidence of both evolutions are presented in *Table 9*:[8]

Table 9 - *Former stress accounts for vowel shifting*

	POc etymon	Pre-Motlav		Motlav	meaning
blocking lexemes	*kasupe	*ná gasúwe	>	na-ghôw	rat
	*kuRita	*ná wuríta	>	na-wyêt	octopus
	*tobʷa	*ná toqá-ku	>	na-tqe-k	(my) bell
	*ⁿdaRaq	*ná dará-ku	>	na-nye-k	(my) blood
permeable lexemes	*bʷawe	*na qóe	>	no-qo	pig
	*piRaq	*na vía	>	nê-vê	k.o. taro
	*suRi	*na súri	>	ni-hiy	bone
	*kawil	*na gáu	>	ne-ge	fish-hook

To sum up, we have demonstrated that *the process of vowel shifting is historically a consequence of former[9] stress*: a radical would become 'permeable' whenever the word stress would strike its first syllable, leaving its prefix unstressed. This historical explanation accounts for the correlation, on the one hand, between permeable roots and CV- structure, and on the other hand, between blocking roots and CCV- structure in modern Motlav.[10]

3.3 Accounting for exceptions

Our hypothesis proves its explanatory power in accounting not only for regular processes, but also for many exceptions. Several (modern) CV- roots which unexpectedly block vowel shifting, actually used to bear stress on their very prefix, but have recently lost an extra mora. This happened when both consonants of the root were identical, causing a geminate cluster to be shortened ($*C_iC_iV > C_iV$):

*ná reréña	> *na-rreñ > *na-reñ > na-yeñ	'turmeric'
*ná loló-na	> *na-llo-n > na-lo-n	'the inside of it'
*ná sasá-ku	> *na-sse-k > *na-se-k > na-he-k	'my name'

This happened, too, when either the first or the second syllable of the root happened to have no consonant (*V instead of *CV), thus bringing about a 'pseudo' CV root which contained an 'invisible' consonant. Examples of [C]CV roots include:

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[8] Notice that we spell Pre-Motlav and Motlav according to the conventions shown in §1: thus q = /ᵏpʷ/; d = /ⁿd/; ñ = /ŋ/; g = /ɣ/; ê = /ɪ/; ô = /ʊ/. In Mota, a language using the same conventions, the lexical items of *Table 9* are gasuwe, wirita, toqa-k, nara-k, qoe, via, sur, gau, with no article (Codrington 1896).

[9] Modern Motlav words are systematically accented on the last syllable, not on the penultimate, contrary to what has been stated in other articles (Crowley forthc.). The evolution of stress from penultimate to final syllable is easy to understand from the deletion rules presented here; the same path was taken from Latin to French, e.g. L cīvitāte(m) [ˌkiˑwiˈtaˑte] > F cité [siˈte] 'city'.

[10] More examples and reflections have been proposed in a former paper (François 1999).

*ná alíto	> na-lêt	'firewood'
*ná alóa	> na-lo	'sun'
*ná añári	> na-ñey	'Canarium almond'
*ná awúa	> na-ô	'turtle'

while examples of C[C]V roots would be as follows:

*ná taúwe	> na-tô	'mountain'
*ná saúm̃a	> na-hôm̃	'Wrasse fish'
*té Roúa	> te-Yô	'from Roua island'

3.4 Emergence of a phonological rule in synchrony

As would be expected, the same process happened to verb roots, bringing about blocking CV lexemes:

$$*mé\ maúri \quad > *me\text{-}mir \quad \text{'(it) lived, grew' (POc *maqurip)}$$

But remarkably, all resulting lexemes were felt to be exceptions to the regular (just emerging) correlation between phonotactics and vowel shifting: as a consequence, all verbs and adjectives underwent a morphological standardization, which created non-etymological permeable CV- lexemes:

$$*me\text{-}mir \quad \rightarrow *mi\text{-}mir \quad > mi\text{-}miy \quad \text{'(it) was in bud'}$$

This process of standardization has been affecting all roots, except the most common nouns, which is not so surprising. However, the pressure of the phonological correlation here under discussion is still so strong, that even these exceptional noun roots are now beginning to conform to the norm, showing it to be still lively and productive. For instance, the 'correct' form te-Yô (see above) is sometimes heard tô-Yô, despite the etymology.

Parallel to this ongoing standardization, it is worth noticing that loanwords are often – though not always– forced into the same correlation between phonotactic structure of the root and compatibility with vowel shifting. For example, a CV- words like *doctor*, when combining with *nA*- article, will have its vowel copied onto the prefix: *no-dokta*; conversely, the word *policeman* gets its first vowel deleted to form a CCV- root, which will block the process of vowel shifting: *na-qlismen*.

The latter evidence suggests that the historical explanation, however powerful it may be to account for present data, must always be completed by a synchronic presentation. Present-day speakers of any language do not just make a passive use of inherited paradigms, which would only find their logic in diachrony. Instead, each generation endeavors to figure out formal similarities and constant correlations out of the amount of forms they are supposed to be using. This is how productive rules emerge, either in phonology, morpho-syntax or semantics, in such a way that the diachronic path leading to the present situation is totally ignored. Because of functional constraints in memory and ease of processing, a new consistent system is built up, slowly but surely.

Most of the time, however, this kind of standardization process is still ongoing in the language, in such a way that only a part of the lexicon –normally the less commonly used– has already been conformed to the emergent rule, whereas several items are used frequently enough to resist for a longer period. This is what happens with about fifty nouns in Motlav, which have not yet undergone the same overall revision that verb or adjective roots have.

4. Synchronic account of vowel shifting: a multilinear approach

The aim of next paragraph is to give a synchronic description of the most productive rule for vowel shifting in modern Motlav.

4.1 Distinguishing tiers

In order to achieve a formal representation of vowel shifting in Motlav, it makes sense to distinguish between at least two layers, one for consonants and one for vowels. Indeed, it has already been shown that Motlav phonology allows only vowels, not consonants, to copy, assimilate or migrate from one place to another within the phonological sequence.

This idea recalls the presentation that Nick Clements made about Kolami, a Dravidian language in which such words as *kinik, suulup, melep, ayak*, are supposed to follow a "rule for propagation of vowel nodes" (Clements 1991). For this purpose, Clements makes use of what a famous article by McCarthy (1989) called *planar V/C segregation*, to account for data in some Semitic and American Indian languages. Here is Clements' presentation of McCarthy's conceptions:

> When [the template] is introduced derivationally, consonants link to it on one family of planes and vowels link to it on another (non-intersecting) one. At this point, consonants and vowels are entirely segregated in phonological representations, and are brought together only by the later process of tier conflation which 'folds' the consonant and vowel planes together.

Vowels and consonants organize into two different tiers, where they first follow their own specific rules; then both tiers eventually 'conflate' to conform to the *syllabic template* of the language, if there is one. Motlav template has already been presented in §1.3: the basic syllabic pattern of this language is ICVCI, with both Cs being optional.

Now, as far as vowel shifting is concerned, let us sum up the rule which affects more than 95 per cent of the lexemes:

- roots beginning with one C ('CV roots') are permeable, i.e. allow their vowel to migrate to a shifting CV- prefix;
- roots beginning with two Cs ('CCV roots') are blocking roots, i.e. prevent their vowel from migrating to the prefix.

An elegant way to represent this phonological process, would be to say that a "vowel node" can propagate to the left of the word boundary, provided it has only a single C to cross over; conversely, a cluster of two consonants behaves as a "blocking node" (Clements 1991), which hinders this vowel propagation.

Let us contrast the behavior of two nouns regarding vowel shifting: one is permeable *nA- + vôy → nô-vôy* 'volcano'; the other one is a blocking lexeme *nA- + °mtig → na-mtig* 'coconut'. In the first case, the vowel of the radical surfaces not only in its own position, but copies also to the left; in the second case, a cluster of two Cs makes the cloning process impossible:
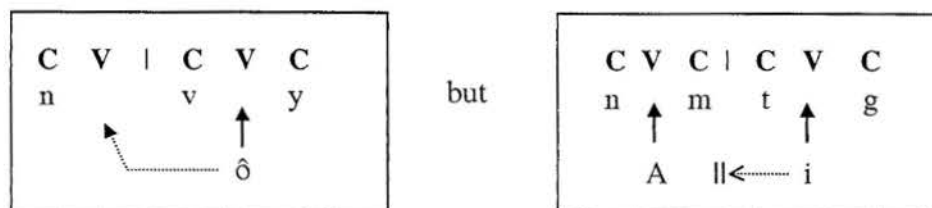
In the remainder of this paper, our main point of interest will be the theoretical nature of the 'default vowel' of the prefix. What kind of phoneme is this, which sometimes surfaces and sometimes doesn't? The point is to escape from the feeling of having a *deus ex machina* phoneme which only exists when needed.

4.2 French 'liaison' and the notion of floating phoneme

Some help may be found thanks to a typological insight on similar processes in other languages. French 'liaison' is a rule which governs surfacing *vs.* non-surfacing of certain word-final consonants, according to the phonotactic structure of the following word. For example, the feminine form of adjective 'small' is spelt *petite*, phonologically /pətit/ with a final /t/ which must always be pronounced –we shall call it a 'true' phoneme; two synonymous phrases meaning 'my girlfriend' are

    – *ma petite copine*   /mapəti t kopin/
    – *ma petite amie*   /mapəti t ami/.

Conversely, the masculine form *petit* shows a special /t/, which will surface only if the second word begins with a vowel: e.g. two phrases for 'my boyfriend' are

    – *mon petit copain*   /mɔ̃pətikopɛ̃/   without a /t/,
    – *mon petit ami*   /mɔ̃pəti t ami/   with a /t/.

The rule for liaison, which concerns the masculine form in the last example, has been described, in a multilinear framework (Encrevé 1988), as involving two fundamental notions:

– first, the notion of *syllabic template*, which consists of a (more or less constraining) string of Cs and Vs;
– second, the notion of *floating phoneme*, whose main property is to surface only on the condition that a slot has been left empty in the template, after other phonemes have taken their place.

In the case of our word *petit*, we can consider there is a *floating consonant* T at the end of the underlying masculine form /pətiT/ – *vs.* feminine /pətit/. This means that this T will only surface if a Consonant slot has been left empty by other 'true' phonemes, within the syllabic template. The latter situation occurs when the next word begins with a vowel, thus leaving an empty C-slot, for the final T to slide into:

```
┌─────────────────────┐       ┌─────────────────────┐
│ C  V  C  V  C  V  C  V │       │ C  V  C  V  C  V  C  V │
│ p  ə  t  i  k  o  p  ɛ̃ │  but  │ p  ə  t  i     a  m  i │
│           ╱              │       │           ╱            │
│           T             │       │           T            │
└─────────────────────┘       └─────────────────────┘
```

4.3 Floating vowels in Motlav

Our aim is not here to discuss French liaison, but to show how relevant Pierre Encrevé's assumptions are for Motlav data. The behavior of this 'floating consonant' in French, which sometimes surfaces and sometimes does not, makes it indeed very similar to the 'default vowel' of shifting prefixes in Motlav. The vowel /a/ of noun article, and /e/ of other prefixes (see *Table 4* in §2.3), can be described here as *floating vowels*. This means that these vowels will surface only if a V-slot is left empty in the syllabic template, once all other phonemes have been realized.

Three situations are possible:

(a) The V-slot has already been taken by a full vowel

This is typically the case when the radical begins with a V, e.g. *ulsi* 'summit':

```
┌─────────────────────┐
│ C  V  C │ C  V  (C)  │
│ n  u  l   s  i        │
│  ╱                    │
│ A                     │
└─────────────────────┘
```

All full-right phonemes start taking their position into the CVC|CVC pattern; then no room is left for the floating vowel. This example helps underline an essential point regarding theory: a floating phoneme may take empty slots in a given syllabic template, but it cannot create one; thus *na-ulsi* is excluded. This is precisely what opposes them to 'true' phonemes, which necessarily have a slot of their own. The following examples will help us further build on this theory.

(b) The floating vowel of the prefix is superseded by a vowel shifted from the root

Another situation is when the radical is 'permeable', i.e. normally starts with one consonant. In this case, the first V of the radical migrates to the prefix(es), and supersedes the floating vowel.

```
┌─────────────────────┐
│ C  V  (C) │ C  V  C  │
│ n          v     y    │
│    ╱ ▶          ↑     │
│   A ╰┈┈┈┈ ô          │
└─────────────────────┘
```

What has happened here is best represented in terms of a chronology of cognitive operations:

1. consonants (here *n-v-y*) take their own slot into the syllabic template CVC|CVC, leaving V-slots empty.

2. the (first) radical vowel (here *ô*), which is a true phoneme, automatically comes into its own slot, between *v* and *y*; only one slot is now left empty, the prefix V.

3. the lexeme vowel has priority over any other V, to fill in the empty V-slot on the prefix; yet, this happens only if it is allowed by phonotactic structures, i.e. if it is not hindered by a cluster of two Cs ('blocking node').

4. if the leftward propagation of the radical vowel was blocked during stage nb. 3, then the floating vowel eventually fills the empty V-slot (see below).

(c)   The slot is free

If operation number 3 above has failed, then the vowel-slot on the prefix is still empty when the floating vowel comes in. This is the only way the 'default vowel' of each shifting prefix may surface:
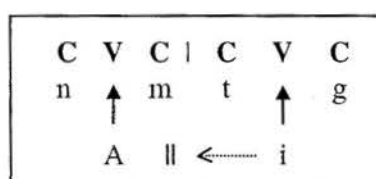
The notion of floating phoneme is therefore very useful in order to account for a vowel which belongs to the lexicon, but shows intermittently. The last section of this paper will confirm how useful this notion is to describe another phonological rule of Motlav, namely *vowel transfer*.

5. Vowel transfer: floating vowels on lexemes

Without going into too much detail, it is worthwhile looking at another phonological rule of Motlav, which we have labeled 'vowel transfer' (see first lines of §2). This rule involves the same eight prefixes which were listed in *Table 4* (§2.3), but different lexemes, which are not concerned with vowel shifting. These lexemes can be either nouns, adjectives or verbs, but are not more than twenty in all: the process of vowel transfer is much more limited than what we have been studying so far.

5.1 A mobile and intermittent vowel

The principle of *vowel transfer* is that when a (shifting) prefix is added to one of these lexemes, the first vowel of the radical does not only copy to the prefix —which corresponds to ordinary vowel shifting–, but also has a rule for deletion:

$$nA\text{-} + hinag \quad \rightarrow *ni\text{-}hinag \rightarrow ni\text{-}hnag \quad \text{'yam'}$$

A simpler way of presenting the same process, would be to consider that the radical vowel directly migrates to the prefix, with no need for an extra deletion rule: *nA- + hinag* →

ni-hnag. This presentation implies that the V of the radical has the particular property of being mobile, which is new in our system. In order to show its special status, we will write it with an uppercase letter, e.g. *hInag* 'yam'.

A short list of the lexemes involved by the latter rule, which we may call 'transferable roots', include the following:

Table 10 - *Some lexemes involved in the rule for vowel transfer*

lIwo	big	*mÊnay*	clever
hInag	yam	*vÊhog*	flesh
sIlatêmê	centipede	*lÊwo-*	tooth
tIwag	one	*dÊlo-*	neck

Table 10 shows that the 'mobile vowel' (MV) involved is always /i/ or /ê/, i.e. high and mid-high front vowels. Consequently, former accounts of Motlav morphology were erroneous, when they considered[11] a vowel like /a/ on the article (e.g. *na-gmel* 'men's house') to come from the deletion of this vowel on the radical (**gamel* < POc **kamaliR*); actually this never happens for /a/ or /e/, which are never more than the default vowel of the prefix itself.

'Transferable roots' have other uncommon properties with regard to their mobile vowel. When the prefix is unvarying, e.g. *ni-* '3rd singular + present', the MV just doesn't appear:

$$ni\text{-} + m\hat{E}nay \quad \rightarrow ni\text{-}mnay \qquad \text{'(he) becomes intelligent'}$$

Conversely, this MV will surface on the right of the first consonant, when the lexeme is unprefixed, or when its prefix has the form CVC-. *Table 11* gives a summary of these rules, with the root *mÊnay* 'intelligent, clever'. The last column shows whether the 'mobile vowel' (MV) appears before or after the first consonant of the radical (C_1).

Table 11 - *Rules involving the 'mobile vowel' of transferable roots*

prefix	prefixed word	meaning	MV / C_1
nA-	*nêmnay*	cleverness	**before**
nE-		is clever	**before**
mal-	*mal-mênay*	is already clever	**after**
Ø	*mênay*	clever	**after**
ni-	*nimnay*	gets clever	**no**

5.2 Floating vowels in lexemes

This property, for a phoneme, to surface or not according to its phonological environment, reminds us again of the *floating vowels* carried by our shifting prefixes (§4.3). The 'mobile vowels' of transferable roots could well be analyzed the same way, since they can be shown to share exactly the same properties. One of these, is the impossibility for floating vowels to create a slot of their own in the syllabic template: all they can do is take V-slots

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[11] See Codrington (1885: 311) with words like *na-bte* (Mota *patau*) 'breadfruit'; and Crowley (forthc.) with words like *na-tm̂an* 'man'.

that have already been created by the phonological structures of the language, and which are left empty after preliminary operations have taken place.

Once again, three cases are possible:

(a)   All slots have been taken by true phonemes

If the prefix is not a shifting prefix, but has the form CV- (e.g. *ni-* 'Third singular present'), then both C and V, which are 'true' phonemes, take the first two slots of the |CVC|CVC| sequence. Afterwards, the first two consonants of the radical (*m* and *n* in our example) take their own slot, in such a way that there is no room left for the floating vowel of the lexeme to surface:

```
C   V   C |  C   V   C
n   i - m    n   a   y
      \   ⁄
          Ê
```

Floating vowels, by definition, cannot create their own position in the template; if they did, we would have a form like **ni-mênay* instead of *ni-mnay*, and there would be no difference between this $\hat{E}$ and a 'true' *ê*.

(b)   A V-slot is left empty on the right of C_1

If the first |CVC| syllable has already been filled in by a CVC- prefix (e.g. *mal* 'Complete aspect'), or if there is no prefix at all, then the first consonant of the radical ($C_1 = m$) has to begin a new |CVC| syllable. Now, we know that phonotactic rules in Motlav exclude consonant clusters within the syllable; as a consequence, C_2 (here *n*) takes the next C-slot, leaving a V-slot empty in the middle. This gives the floating vowel an opportunity to surface on the right of C_1:

```
C   V   C |  C   V  (C) |  C   V   C
m   a   l    m              n   a   y
                   ⁄
                Ê
```

(c)   A V-slot is left empty to the right of C_1: competition between two floating Vs

The third case is when the lexeme takes a C- prefix (which does not exist in Motlav) or a shifting CV- prefix. In this case, the first three 'true' phonemes involved are three consonants (here *n*, *m*, *n*), which automatically fit into the syllabic template |CV-C|CVC|. The V-slot on the prefix is left empty again, allowing for a floating vowel to surface on the left of C_1:

```
C   V   C |  C   V   C
n       m    n   a   y
    ⁄   \
    A   Ê
```

$nA\text{-} + m\hat{E}nay \rightarrow n\hat{e}mnay$
'cleverness'

The latter example provides us with some new information. First, floating vowels in Motlav have the property of being mobile, which was not visible in the previous discussion; a good representation would be to say that this MV (e.g. $\hat{E}$) is 'attached' to the first consonant of the lexeme (e.g. *m*).

Secondly, in a situation where two *floating vowels* are competing for the same empty V-slot, the vowel of the radical has priority over that of the prefix, excluding a form like **na-mnay*. This kind of hierarchy LEXEME > PREFIX is instructive about the way morphology is cognitively perceived.

Conclusion

As far as the vocabulary is concerned, Motlav can be said to be a conservative language, since it shares many items with neighbouring Mota or with Proto Oceanic. However, historical effects of former stress have largely modified not only the shape of the words, but also the very mechanisms of the whole phonological system. Inherited structures have recently undergone several processes of standardization and reanalysis, bringing about novel phonotactic constraints –a CVC syllabic pattern– and morpho-phonemic rules, including vowel shifting. Moreover, we have demonstrated that a special sort of phoneme was created through history, namely our 'floating vowels'; these are present in less than thirty items of the language, but their frequence makes them crucial to understand the whole morphology and grammar of the language.

Finally, we would like to put forward the idea that formal analysis is not there to confirm or invalidate a theory defined *a priori*, but must help build this theory out of the very data. Linguistic structures are already present in the way people talk, and it is neither necessary, nor scientifically satisfying, to hypothesize them out of the blue, '*more geometrico*'. Theory and formalism in linguistics must serve the empirical observation, and not the reverse.

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Transitivity Alternations in Rotuman*

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1.0 Introduction

The relationship between verbal affixation and structural case assignment has occupied a central position in discussions of Western Austronesian 'focus' systems (e.g., for a recent discussion of these issues in Malagasy, see Paul 2000). Considerably less attention has been paid to related processes in Oceanic languages. This paper is a preliminary attempt to explore the effects of verbal affixation on transitivity alternations in Rotuman. It turns out that several other phenomena, such as negation and voice neutrality, have interesting roles to play with regard to transitivity. In addition, the discussion of transitive suffixes will shed new light on certain aspects of incorporation. Evidence for the claims made in the paper will be based on data from Rotuman folktales and examples from Churchward (1940).

Section 2 gives a brief general background on Rotuman. Section 3 describes various triggers for valence changing. Section 4 presents a number of interesting aspects of incorporation in Rotuman. In Section 5 I point out the likely need for revision to some of the restrictions on affixation asserted by Churchward (1940). Section 6 sketches out briefly my views on the diachronic development of the -'aki causative. Finally, Section 7 presents some concluding remarks.

2.0 Background

Rotuman is a member of the Central Pacific group within Oceanic. It is traditionally treated as forming a subgroup with Fijian. Rotuman adheres fairly strictly to a surface SVO order. Nominals and pronominals show no overt case marking but both show alternation in form due to 'phase' distinctions.[1] In addition, some pronominals have distinct genitive and suffixed forms. Unsuffixed verbs are generally voice-neutral. For example, Churchward (1940:123) points out that *iris 'ā* could mean either 'they ate' or 'they were eaten.' Ilustrations are given in (1) and (2) below.

(1) *iris rou le'   ta   'e Losa*
     they leave child the P Losa
     'they left the child at Losa'

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[1] Any differences in form as a result of phase are abstracted away from in the glosses here as they are not relevant to the discussion. For some detailed discussions of Rotuman phase, see McCarthy (1995 and 1999), Hale and Kissock (1998), and Hale (2000).

(2) *iris   rou   'e Losa*
    they leave P Losa
    'they were left at Losa'

Churchward (1940) classifies verbs into three categories. The first two categories distinguish unsuffixed verbs which are typically used intransitively from unsuffixed verbs which are typically used transitively. He states of the former type, "Verbs that are seldom or never used transitively are classed as intransitive." Examples (3-5) are illustrations.

(3) *gou fesia' se irisa*
    I   hate   to them
    'I hate them.'

(4) *nōnō ma   'oria   ö'   rua al   (Tiaftot 16.8)*
    after awhile their(2) parent two die
    'After awhile, their parents died...'

(5) *Tinrau, fā 'on   sau, seksek   se ut   ne 'on hanue ta   (Tiaftot 16.11)*
    Tinrau son belong king walk-along to end of his town   the
    'Tinrau, the king's son, walked along to the outskirts of his town.'

At the same time, he gives an example of a 'usually intransitive' verb used transitively: *mata'u* – *ia mata' se irisa* 'he looks after them' but, *ia mata' iris* 'he looks after them.'

Of the latter (unsuffixed verbs typically used transitively), he says "Verbs which are used transitively though they have no trans.suffix – and there are many such verbs in Rotuman – are said to be "informally" trans. Exs. are *hili, hil*, to choose, and *ho'a, hoa'*, to take or carry."[2] A textual occurrence of this last is given in (6).

(6) *ne   'auar   hoa' ia se tei   (Äetos 176)*
    ind.q. you-two carry it to where
    '...where you two are carrying it to.'

Once again, Churchward qualifies strict categorization by adding, "Some verbs, again, which are usually trans. (inf.t.) are occ. used intransitively: e.g., *tuki* 'to stop (a person from doing something)' is generally trans., as in *gou la tük iris*, 'I will stop them'; but one may also say (with a slightly different force) *gou la tük se irisa*, 'I will make an effort to stop them...' "

It is apparent from his examples and discussions that Churchward takes the presence of a prepositional phrase (along with absence of a bare object) to be clear evidence of intransitivity.

3.0 Changes in Valency

As will be illustrated below, the number of arguments of a verb may be either increased or reduced in Rotuman by means of suffixation or by the presence of a counterfactual, such as negation.

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[2]Churchward typically cites both complete and incomplete forms, as here.

3.1 Transitive Suffixes

The third of Churchward's verb categories (referred to in Section 2.0 above) comprises all verbs which are transitive due to their form. He explains this as follows (Churchward 1940:22):[3]

> The principal suffixes that serve to mark verbs as transitive are -a, -na, and -kia, some verbs taking one, some another. When -a is used, it is attached to the com.phase; -na to the com. phase (its e-form if it has one); -kia to the inc. phase.

Moreover, "Verbs having these suffixes are said to be 'formally' trans., their transitiveness being shown by their form." As such, examples (7) and (8), both of which have transitive suffixes, may be contrasted with their unsuffixed counterparts in (3) and (6) above.

(7)　*gou　fesi'en　iris*
　　　I　hate　them
　　　'I hate them'

(8)　*'amia　la　hoa'kia　äe*　　*(Äetos 216)*
　　　We-two　will　carry　you-sg
　　　'We will carry you'

Unlike in the case of unsuffixed verb forms described in Section 2.0, Churchward offers no qualifying remarks which allow for some exceptions. Instead, he states quite deliberately: "Formally trans. verbs, however, cannot be used intransitively: they are immutably transitive" (Churchward 1940:116).[4] We will see below that the 'formal' transitive suffix has a somewhat wider and more interesting distribution than is initially implied in this section.

3.2 The -'aki Suffix: Causatives and Applicatives

Rotuman has a single form, -'aki, which functions either as causative marker or an applicative marker, increasing or reducing, respectively, the valency of the verb. Churchward (1940: 105-6) notes the following functions for this suffix:

(a) "Causative. This usage is very common, though by no means universal, with intr. verbs: see I.14.1 (a). In a few instances it occurs with inf.t. verbs (cp. I.11.3): e.g., from *tole* 'to carry on the shoulder,' we get *tol'aki* 'to cause to be carried on the shoulder,'..."

(b) "Relational or Prepositional: *pani* 'to paint', *pàn'aki* 'to paint with;' *fäega* 'to speak,' *fäeag'aki* 'to speak about;' *mua* 'to go in front,' *mua'aki* 'to go in front of, to lead'."

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[3]It is likely that there are, at most, two different forms of this transitive suffix, the remaining form being a predictable allomorph. This matter requires further exploration.

[4]He does, however, offer an interesting comment on the transitive suffix and voice neutrality. He states "It appears, however, that the pass. sense is more frequently expressed by an inf.t. verb...than by a f.t. one..."(Churchward 1940:22) As he gives no examples, it is difficult to determine the characteristics of a passive, formal transitive verb.

(c) "Durational: *mauri* 'to live,' *maur'aki* 'to live for (some number of years)'."

He goes on to note that:

> Many words terminating in - *'aki* may be used in two or more of the above senses.
> E.g., *'ātē'aki*, from *ā'tē*, to eat things, may come under either (a), (b), or (c), mean-
> ing (a) to cause to eat, to feed, (b) to eat with, to use (cutlery, plates, etc.) in eating,
> (c) to eat for (so long).

The causative function of - *'aki* does not appear to be its most common function. It com-
petes, in this function, with the Rotuman reflexes (one 'direct' and one 'indirect') of the well-
reconstructed POC causative prefix **paka-*: *a'a-* and *faka-*. Churchward classifies causative
verbs in - *'aki* as 'informally transitive' and notes that they have 'formal transitive' counterparts.
Thus we get *ala* 'to die', *al'aki* 'to kill' ('informal transitive'), and *al'akia* 'to kill' ('formal
transitive' with transitive suffix -*a*).

The voice neutrality of unsuffixed verbs in Rotuman interacts in interesting ways with the
- *'aki* causatives. For example, in many cases it appears that it is the *passive* reading of the bare
stem which serves as the input to causative formation, as in the example cited by Churchward
in the discussion of causatives above: *tole* 'to carry on the shoulder' – and therefore, by voice
neutrality, also 'to be carried on the shoulder' – causative *tol'aki* 'to cause to be carried on the
shoulder,' built only to the passive reading. By contrast, the verb *'imo* 'drink' (but also, by
voice neutrality, 'to be drunk' in the non-alcoholic sense) gives rise to an ambiguous - *'aki* form:
'iom'aki means both (a) 'to cause (obj. a person) to drink' and (b) 'to cause (obj. water) to be
drunk.' Such alternations may tell us something important about the core argument structure of
the stems involved.

The 'relational' or 'prepositional' use is, however, by far the most common use of - *'aki* in
Rotuman. The types of relationships it may express appear to be centered around 'instrumental'
and 'dative' (broadly construed, i.e., including both goals and beneficiaries, for example). It
appears to promote an originally oblique argument with this type of theta-role to direct object
position. Some additional examples include:

> *afa* 'to make a mark/impression' ('on' expressed with a PP): *af'aki* 'to make a mark with
> (obj. pencil, rubber stamp, etc.)'

> *atu* 'to grasp or embrace tightly with both arms' : *at'aki* 'to clasp (obj. arms) tightly
> around (*se*) something'

> *lemi* 'to lick' : *lem'aki* 'to lick with' (obj. the tongue)

> *mamāe* 'to mourn' : *mamāe'aki* 'to mourn for'

> *momono* 'to plug up, block' : *momon'aki* 'to use for plugging up or blocking'

The 'durational' function mentioned by Churchward may be able to be collapsed with the prepositional uses mentioned above. If we assume that the prepositions used to express these durational properties are dative or instrumental markers, the generalization would be simply that anything marked by these prepositions may be elevated to object position by - *'aki.*

It is of considerable interest that not *any* prepositional relationship can be captured by - *'aki* suffixation. Simple spatial relationships (under, behind, by, from, around) and non-dative directionals (e.g., from, away from, through) do not appear to be expressable by - *'aki* and a direct object. If we accept, on the evidence of Western Austronesian 'focus' systems, that theta-roles like 'goal' and 'instrument' must be structurally represented (cf. Paul 2000), it is likely that it is precisely these structural positions which - *'aki* deals with.

Not surprisingly, there is no indication, either in Churchward or in the texts, that it is possible to attach a transitive suffix to the applicative - *'aki* forms (as one may to causative - *'aki*).

3.3 Counterfactuals – Negation and Optative

Rotuman has bipartite negation, as in French *ne...pas.* The Rotuman forms are *kat...ra,* or, in the future, *kal...ra*), with (minimally) the verb placed between the two elements.[5] With informally transitive (i.e., unsuffixed) verbs, negation may detransitivize the verb, forcing its object into a PP as in example (10) below. This detransitivization is also seen with the optative *pa* 'to wish', as in (11).

(9)   *ia rē garue ta*
        he do work   the
        'He does the work'

(10) *ia kat rē ra   'e garue ta*
        he NEG do NEG P work the
        'He did not do the work.'

(11) *ia pa   rē 'e garue ta*
        he OPT do P work the
        'He wishes to do the work.'

The exception to this is if the object is indefinite, such sa the object in (12), which is marked by preposed indefinite *ta*.

(12) *ia kat al'ak ra   ta le'*
        he NEG kill   NEG a person
        'He did not kill anyone.'

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[5]The surface position of the verb in negated strings (between the two 'parts' of the negation) suggests that Rotuman has V-raising at least to T, if not higher.

Textual examples of this contrast can be seen in (13) and (14).

(13) *põ 'e hàn   ta   kat   'es   vävâne-t   ra*   *(Haoag 8)*
since woman the NEG have husband-a NEG
'since the woman did not have a husband'

(14) *ka   gou   kal   'es   hoi'àk   ra   'e   'äea*   *(Pure 40)*
and I   NEG-FUT have any more NEG P you-sg
'and I will not have you any more'

Formally transitive verbs (those marked with the transitive suffix) do not detransitivize under these same conditions, as shown in (15).

(15) *ia   pa   kat   al'akia   ra   iris*
he wish NEG kill-tr   NEG them
'He does not wish to kill them.'

Churchward notes a semantic differences between the type found in (10) (an unsuffixed, normally transitive verb which is detransitivized under negation) and that found in (15) (a transitive suffixed verb which remains transitive under negation). The relevant semantic contrast can be seen from the translation of (16) and (17) below (where upper case is used to indicate emphasis).

(16) *ia   kat   al'ak   ra   'e   irisa*
he NEG kill   NEG Prep them
'(The man said he would kill them but) he did NOT kill them.'

(17) *ia   kat   al'akia   ra   iris*
he NEG kill-tr   NEG them
'(The man wounded them but) he did not KILL them.'

The phenomenon of detransitivization by counterfactuals is found in many other languages (e.g., Russian and Lithuanian), however, I am not familiar with it in any other Oceanic languages. *If* it can be demonstrated that the inability of the negated verb to assign accusative case to indefinites arises for some well-defined structural reason, the fact that Rotuman (unlike its Oceanic neighbors) shows such a phenomenon could be telling as to fundamental aspects of its structure.

4.0 Incorporation and Affixation

4.1 Types of Incorporated Elements
Negation serves as a useful diagnostic for incorporated elements (as noted, for incorporated nouns, by Churchward 1940:122). Unsurprisingly (in an Oceanic context), bare indefinite nouns regularly incorporate into the informally transitive (unsuffixed) verb form. The relevant contrast can be seen in (18) vs. (19) and (20) vs. (21) below.

(18) *ia   kat   'inea   ra   ta   tē*
    he   NEG   know   NEG   some   things
    'He doesn't know things.'

(19) *ia   kat   'inea   tē   ra*
    he   NEG   know   things   NEG
    'He doesn't know things.'

(20) *ka   le'   mo   rua   'i   kat   pōpō   rog   ra   e... (Äeatos 143)*
    but   child   ptcl   2   these   NEG   get   report   NEG   about-it...
    'but the children did not get any report about it'

(21) *Ka   fā   ta   kal   lua   tē   ra   (Haoag 66)*
    and   boy   the   NEG-fut   spit-out   thing   NEG
    'and the boy wouldn't spit anything out'

It is quite surprising, however, that more complex *indefinite* objects can also incorporate, including DP's, both relatively short additions to the bare N as in (22), see also (13) above, and significantly longer ones (23):

(22) *Ma   raksa'ia   'e   'itar   kat   'es   ṛahi-t   ra   (Le Mafi 109)*
    but   unforunate   that   we-2   NEG   have   fire-any   NEG
    'but unfortunately we haven't any fire'

(23) *ma   kat   'es   sui   tore-t   ra   (I'or 59)*
    but   NEG   have   bone   leftover-a   NEG
    'but he didn't have a leftover bone'

Explicit morphological plurals, also not generally subject to incorporation in Polynesian and Micronesian languages, may be incorporated in Rotuman, as can be seen in the following example in which *lele'a* is the lexical plural of *le'e* 'child.'

(24) *Ka   sàghàn   uan   'on   Rah   kat   'es   lelea'   ra   (Haoag 11)*
    and   sister   middle   his   Raho   NEG   have   children   NEG
    'and Raho's middle sister had no children'

In addition, while many Oceanic languages attest to the incorporation of directionals (a type of adverb) into the verb, Rotuman allows a much broader range of adverbs to incorporate, as can be seen in example (15) above, in which *hoi'ạki* 'any more; again' is incorporated, as well as from:

(25) ke   kat   haʻhaʻu-ag   ʻesea   ra   se   ʻoris   öʻ   rua   (ʻÄeatos 19)
     only   NEG   reach-DIR   same   NEG   P   their   parent   2
     'only they did not reach at the same time their parents'

It appears from these facts (and assuming that position relative to negation is a reliable diag-
nostic for incorporation) that Rotuman has generalized the common Oceanic process involved
in incorporating bare non-specific (i.e., indefinite) N's to all indefinite objects, including phrasal
ones. In addition, Rotuman appears to have generalized with widespread Oceanic process under-
lying the incorporation of directional adverbials to a variety of temporal and manner adverbials
as well.

4.2 Affixation to Incorporated Elements

Churchward asserts (1940:107) that a number of suffixes, including directionals, the 'ingres-
sive' in - ʻia, the 'pronominal suffixes' which express the ingressive for certain types of verbs
(these are in fact reflexive pronouns), and the transitive suffixes used form 'formally transitive'
verbs follow the adverb, should the verb to which they properly should be attached be accompa-
nied by one. He gives the following examples:

(26) iris   sur   miji-m   (*iris   surum   mij)
     they   come   promptly-DIR
     'they enter promptly'

(27) fä   ta   fek   fakapau-ʻia
     man   the   angry   very-INGR
     'the man became very angry'

(28) gou   jön   väve-atou
     I   flee   quickly-I
     'I fled quickly'

(29) fä   ta   füt   hoiʻaki-a   lū   ta   (*fä   ta   futia   hoiʻäk   lū   ta)
     man   the   pull   again-TR   rope   the
     'the man pulled the rope again'

Such sentences are also attested in the legends:

(30) ka   ia   kal   pō   hoiʻäk-ʻia   ra   ia   (Sau 156)
     and   he   NEG-fut   get   again-INGR   NEG   her
     'and he would not be able to get her again'

(31) ka   fä   rua   kat   rē   aʻlelei-ʻia   ra   hàn   rua   (Sianpualʻetaf 45)
     and   man   2   NEG   treat   badly-INGR   NEG   wife   2
     'and two men began to ill treat their two wives'

(32) *ka iria kat foar pau sio ra se han rua ('Äeatos 27)*
    and they NEG tell fully DIR NEG P woman 2
    'and they didn't explain fully to the two women'

Suffixation of this type strongly supports the idea that these adverbs are, in fact, incorporated —
note particularly that the transitive suffix will follow the adverb if present.

The incorporation of adverbs is found in the more archaic Indo-European languages as well
as in Rotuman. In the Indo-European case, this incorporation goes hand-in-hand with the incor-
poration of prepositions. This makes an analysis under which the 'applicative' - *'aki* construc-
tions (involving the elevation of dative and instrumental arguments to direct object status) are
taken to arise via the mechanism of 'preposition incorporation' (see Baker 1988) plausible.

As expected, incorporated nouns also form the basis for the attachment of these affixes
(Churchward 1940:122):

(33) *ia fä' puku-m se goua*
    he write letter-DIR to me
    'he wrote to me'

(34) *fä ta 'inea tē-'ia*
    man the know thing-INGR
    'the man comes to know things'

(35) *gou fä' puku-etou*
    I write letter-I
    'I start letter-writing'

Note, particularly, the use of the transitive suffix attached after an incorporated noun in (34)
which Churchward says is practically synonymous with (35).

(36) *ia rak'äk tē-an iris*
    he teach thing-TR them
    'he teaches them things'

(37) *ia rak'ak tē se irisa*
    he teach thing P them
    'he teaches things to them'

Oddly, Churchward (1940:107) notes that the suffix -*aki* "is not moved along in this way, but
remains where it was." Note that his own example, cited in the discussion of the causative suffix
in Section 2.3 above (*'ātē'aki*), involves the affixation of - *'aki* to a verb+incorporated noun
pair, for which his dictionary provides additional examples (e.g., *hö'sol'aki* 'to heap or pile up'

< *ho'i* 'accumulate, fetch, heap' + *solo* 'mound' + -*'aki*). Since on this page he is explicitly discussing 'shifting' of these affixes to a position following adverbs (rather than incorporated nouns), it is possible that -*'aki* will *only* 'shift' around incorporated nouns (not adverbs). No examples involving adverbs, either way, are known to me at this time.

The shifting of verbal affixes to a position following incorporated adverbs and nouns is clearly of great significance in revealing the precise structural status of these incorporated elements. It may also bear on the long-debated issue of whether incorporation is a lexical or a syntactic process. While the ability of 'V+incorporated Noun/Adverb' to take a transitive suffix may be taken by some to be clear evidence of a derivation in the lexicon (i.e., compounding), the apparently obligatory (at least in the case of adverbs)[6] and fully productive nature of the incorporation clearly points in the direction of syntactic derivation. These constructions may thus force us to rethink what is and what is not a test for this critical distinction.

5.0 Restrictions on Affixation

Churchward (1940:117) notes that "F.t. verbs cannot take any of the tense-forming suffixes." The set of suffixes involved in the 'tense' marking cases mentioned by Churchward include -*'ia*, -*tia*, -*a*, and the 'reflexive' object pronouns. The first three look like versions of the POC transitive suffixes. While a detailed investigation of the use of these forms in Rotuman is still outstanding, I am disinclined at this time to accept Churchward's characterization of them as marking 'tense' at all. In some cases I strongly suspect they represent the POC *-Cia suffixes, whose precise function differs from language to language even within Polynesian (e.g.), and has proven remarkably difficult to characterize definitively. The suffix was, in any event, incompatible with any transitive marking on the verb to which it attached. These forms need to be investigated in Rotuman – without such an investigation, their significance for the problems under discussion cannot be determined.

6.0 Origin of Causative -*'aki*

It is difficult to see how we might connect the causative function of the -*'aki* suffix with its applicative functions synchronically. However, since the suffix has no plausible POC etymology (note that the POC 'remote transitive' suffix *-aki(ni)* is not an ideal candidate, given the Rotuman glottal stop), it must have originated within Rotuman. It is hard to see how *two* unrelated suffixes of this shape could have independently developed in this brief time. So I offer the following *diachronic* speculation on the origin of causative -*'aki*.

1 -*'aki* arises as an incorporated instrumental preposition. (This is its most widely attested synchronic function, and probably the most difficult to get from any other diachronic source.)

2 -*'aki* comes to mark the promotion of other oblique *structural* cases, such as the dative. We have seen this type of syntactic extension several times already in Rotuman: originally,

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[6]There are no instances of *kat VERB ra ADVERB* in the extensive corpus of Rotuman legends, indicating the adverbs obligatorily incorporate.

from comparative evidence, it is necessary to assume that only *directional* adverbs were incorporated – now all adverbs are; again based on comparative evidence it seems that originally only (indefinite) bare-nouns were incorporated, now any indefinite DP may be.

3 Many instrumental applicative - '*aki* verbs were subjected to a reanalysis based on the following systematic ambiguity (using the examples cited on pg. 3 above):

(a) He makes an impression on the paper with a pencil = (b) The pencil makes an impression on the paper.

(a) He embraces the child tightly with his arms = His arms clasp tightly around the child.

(a) He licks at the candy with his tongue. = (b) His tongue licks at the candy.

(a) He plugs up the hole with a cork = (b) A cork plugs up the hole.

The - '*aki* forms were originally instrumental applicatives to the (a) sentences, but were reanalyzed as *causatives* to the (b) sentences. (For a similar reanalysis of instrumentals, see Garrett 1990.) That is, they are reinterpreted as meaning 'he makes the pencil make an impression on the paper,' 'he makes his arms clasp tightly around the child,' 'he makes his tongue lick at the candy,' and 'he makes a cork plug up the hole.'

4 This new 'causative' - '*aki* comes to be used in cases in which no instrumentality was ever involved, such that *ala* 'to die' can form *al'aki* 'to kill.'

7.0 Conclusion

I have tried to show in this paper that Rotuman offers a wealth of interesting data, much of it Oceanic-like but with a unique Rotuman twist, which bears on fundamental questions surrounding structural case and argument structure. This primarily descriptive account is the necessary first step in developing the formal syntactic analysis which I hope to be able to provide in a subsequent paper.

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Fixed segmentism, markedness and faithfulness: Nominalising reduplication in Chamorro[*]

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Fixed segmentism in reduplication occurs when invariant segments appear where copying is expected otherwise. Fixed segmentism has been important for a number of issues in theoretical phonology including prespecification (Marantz 1982, among others) and underspecification (Pulleyblank 1988, among others) in rule-based phonology and the approach to markedness in Optimality Theory (OT) (Alderete et al. 1999). Given the theoretical significance of fixed segmentism, any newly uncovered pattern of this type of phonological structure is of inherent interest to phonological theory. A major result of the authors' fieldwork on Chamorro reported in this paper is that Chamorro nominalising reduplication exhibits two fixed vowels, the unmarked high front vowel [i] and the marked low front vowel [a]. Given that this pair of fixed segments includes a cross-linguistically marked vowel, the pattern from Chamorro presents a challenge to the idea formalised in the OT framework by Alderete et al. (1999) that fixed segmentism decreases phonological markedness. On the other hand, given that the fixed vowels of Chamorro nominalising reduplication include the cross-linguistically unmarked high front vowel, the OT approach to fixed segmentism appears as a viable framework for the formal analysis of this pattern. In addition to exploring the connection between phonological markedness and fixed segmentism, Alderete et al. (1999) have claimed that any phonological restriction resulting in fixed segmentism in reduplication must be matched as a possible restriction on default patterns or segmental inventories elsewhere. As is demonstrated below, the patterns of default vowel phonology found in Chamorro do not match the pattern of fixed segmentism observed with nominalising reduplication. Thus, Alderete et al.'s approach predicts that the set of fixed vowels found in nominalising reduplication should constitute the vowel inventory of some other language or languages. As is shown in this paper, this prediction is met through vowel inventories which are restricted to non-schwa vowels of maximally contrasting height.

The model of reduplication invoked in Alderete et al. (1999) is couched in the framework of correspondence theory presented in McCarthy & Prince (1995). However, McCarthy & Prince's (1995) model of correspondence has been shown to be problematic for cases in which the reduplicant morpheme appears to be more faithful to the input than to the surface reduplicative base (Raimy & Idsardi 1997, Spaelti 1997). In McCarthy & Prince's (1995) full model of correspondence, the reduplicant may be subject to input-reduplicant faithfulness to force faithfulness to the input root. As pointed out in Raimy & Idsardi (1997), this notion is problematic because it evaluates faithfulness by comparing the input of one morpheme to the output of another, thus weakening the idea of faithfulness itself by postulating cross-morphemic comparison (see Spaelti 1997 for further criticism of the full model). The data presented in this paper show that prefixal reduplicants in Chamorro take certain cues for their segmental from the input rather than the surface representation. Thus, low front [a] appears in the nominalising reduplicant with low vowel roots even though the surface base vowel may be reduced to schwa (cf. ['katsaʔ] 'to husk a coconut' versus ['ka+kətsaʔ] 'coconut husker'). Furthermore, mid vowels in the reduplicant of continuous aspect reduplication in Chamorro match the input root, but need not match the surface base

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as evidenced in ['kɔnnɪ?] 'to catch, to take' versus ['ko+kʊnnɪ?] 'catching, taking'. Thus, the data from Chamorro are evidence for the necessity to examine fixed segmentism in light of recent approaches to apparent input-reduplicant faithfulness. As a consequence, we present a model of reduplication in which word faithfulness (Struijke 2000) is indispensable to the understanding of fixed segmentism.

Chamorro is an Austronesian language spoken on the Mariana Islands of Guam, Saipan, Rota and Tinian and in expatriate communities in the United States. The available descriptions of contemporary Chamorro (Topping 1973, 1980, Topping *et al.* 1975) provide only a fragmentary description of fixed segmentism in nominalising reduplication. Furthermore, notwithstanding the great insight displayed in these sources, these works also employ certain descriptive generalisations that are not correct, as is shown below. Thus, there is a need for a more complete and more accurate description of fixed segmentism in Chamorro. The present paper addresses this need using data from our fieldwork on Guam in the Summer of 1999. The results of this fieldwork not only show that the vowel inventory of the nominalising reduplicant is restricted to [i] and [a], but also show that the nominalising reduplicant induces vowel fronting or *umlaut* in the base and that the base is subject to Vowel Lowering. Given that *umlaut* and Vowel Lowering have received much attention in recent theoretical works (Chung 1983, Halle & Vergnaud 1987, Crosswhite 1998, Klein 2000), the data from nominalising reduplication presented here have implications beyond the focus of this paper.

This paper is structured as follows. §1 lays out preliminaries that are essential for the understanding of the vocalism of nominalising reduplication. This is followed in §2 by a brief review of previous descriptions of this pattern. §3 presents and describes the data from our fieldwork and lays out the generalisations concerning the vocalism of nominalising reduplication. In §4 we present our analysis of fixed segmentism in nominalising reduplication paying particular attention to issues of markedness and faithfulness. §5 presents some conclusions and suggests directions for future work.

1.Preliminaries

In this section we describe the inventory of Chamorro monophthongs under primary and secondary stress and in unstressed position and comment on the distribution of tense and lax vowels and the phonemic status of mid vowels. Furthermore, we lay out some of the basic stress facts of Chamorro and comment on the behaviour of *umlaut* and Vowel Lowering. In particular, we present data showing that Vowel Lowering in the reduplicative base may result in a mismatch between the reduplicant and the base vowel in Chamorro reduplication. Finally, we present the feature system used to specify the vowels of Chamorro.

Given that Chamorro is a stress language, it is expected that the vowels of Chamorro covary depending on the degree of stress, as is common in other stress languages. Under primary stress Chamorro has a symmetrical six-vowel system of monophthongal underliers in lexical contrast (Topping 1973, Chung 1983). This system may be graphically represented as in figure 1. below.
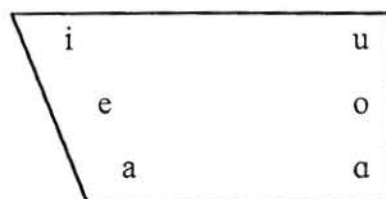
Fig. 1. Chamorro symmetrical system of six vowel underliers under primary stress

Note that the system displayed in fig. 1. emphasises the phonological symmetry of the series of three front vowels versus three back vowels distributed evenly along the height dimension. This system abstracts away from phonetic reality in that nonlow vowels show

tense and lax allophones which are distributed allophonically. The data in Chung (1983) and Topping (1973) show that nonlow vowels in Chamorro are lax in closed syllables and tense in open syllables. There is variation in the data presented in these works with respect to the tense versus lax distinction in open unstressed syllables. Whereas Topping (1973) maintains that nonlow vowels are lax in open unstressed syllables, the transcriptions in Chung (1983) show tense nonlow vowels in unstressed open syllables. The data in our corpus show evidence for the sum of these descriptions. Thus, nonlow vowels are lax in closed syllables regardless of the level of stress. Furthermore, nonlow vowels in open syllables are generally tense in stressed syllables, whereas they may be tense or lax in unstressed syllables. Note that for the purposes of the analysis presented in this article, we abstract away from the tense-lax distinction.

Chamorro shows stress reduction in that the inventory of low vowels is reduced under secondary stress and in unstressed position. Thus, the data in our corpus generally confirm Chung's (1983) observations that low vowels under secondary stress merge to [a] and that the low vowels merge to [ɑ] in unstressed syllables. Furthermore, we also found data in evidence of Topping's (1973) observation that the low vowels may appear as [ə] in unstressed position (see below). Note that schwa may not occur under stress. In contrast to the low vowels, all nonlow vowels of Chamorro may occur under secondary stress and in unstressed position.

Some previous authors have claimed that mid vowels are not phonemic underliers in present-day Chamorro, at least not in the native vocabulary (Witucki 1973, 1974, Chung 1983). However, other works disagree with this view and maintain that mid vowels are possible underliers in Chamorro including the native vocabulary (Topping 1973, Halle & Vergnaud 1987). The primary evidence for the scepticism towards mid vowel underliers stems from the fact that their distribution is restricted in that they are primarily observed in stressed closed syllables whereas high vowels generally occur in the place of mid vowels elsewhere, that is, in open syllables and in unstressed position. However, a careful inspection of the available evidence shows that mid vowels may occur in stressed open syllables in items that are not borrowed from Spanish or English. Thus, lexical items such as *bélu* 'tottering, balanced (upright)' and ['boʔɑn] 'froth, bubbles' show that mid vowels may occur in stressed open syllables in roots. Furthermore, stress-attracting prefixes such as *ké-* 'about to, try' and *é-* 'look for, hunt' (Topping 1973) contain mid vowels in open syllables as in ['ke+kɔnnɪʔ] 'try to catch' (cf. ['kɔnnɪʔ] 'to catch'). In addition, the stress-attracting reduplicant in what Topping (1973) labels *continuative aspect reduplication* shows mid vowels in open stressed syllables. Consider the data in (1).

(1)   Mid vowels in continuative aspect reduplication

(a)	['ʔɛntalʊʔ]	'to interfere'	['ʔe+ʔɛntalʊʔ]	'interfering'
(b)	['pɛskɑ]	'to fish, to hunt'	['pe+pɪskɑ]	'fishing, hunting'
(c)	['kɔnnɪʔ]	'to catch, to take'	['ko+kɔnnɪʔ]	'catching, taking'
(d)	['sɔddɑʔ]	'to find'	['so+sʊddɑʔ]	'finding'

As shown in (1), mid vowels regularly occur in the auto-stressing open syllable reduplicant in continuative aspect reduplication. Given this evidence for the occurrence of mid vowels in open syllables, we conclude that mid vowels are possible underliers in Chamorro even though their distribution is somewhat restricted, thus essentially following the view in Topping (1973) and Halle & Vergnaud (1987).

The default location of primary stress in Chamorro words is on the penultimate syllable ((2) (a)). However, certain roots have antepenultimate or final stress, as shown in (2) (b) and (2) (c), respectively.

(2)   Chamorro primary stress (Data reproduced from Chung 1983: 38)
        (a)   pulónnun   'triggerfish'
        (b)   dáŋkulu   'big'
        (c)   peskadót   'fisherman'

Certain Chamorro prefixes attract primary stress onto themselves, thus disrupting regular penultimate stress. Note that the reduplicant morphemes of continuative aspect reduplication (see (1)) and nominalising reduplication belong to the class of stress-attracting prefixes.

Chamorro has two well-known alternations in its vowel system, vowel fronting or *umlaut* (Topping 1973, Chung 1983, Klein 2000, among others) and Vowel Lowering (Chung 1983, Crosswhite 1998, among others). *Umlaut* in Chamorro is the fronting and, for rounded vowel underliers, the concomitant derounding of input back vowels induced by certain morphological units including the determiner *i* 'the'. Consider the data in (3).

(3)   Chamorro umlaut

(a)   ['gumaʔ]   'house'   [i 'gimaʔ]   'the house'
(b)   ['pɔtta]   'door'   [i 'pɛtta]   'the door'
(c)   ['atsʊʔ]   'rock'   [i 'atsʊʔ]   'the rock'

The data in (3) show that Chamorro umlaut fronts the back vowel underliers to result in the corresponding front vowels.

The basic generalisation concerning Vowel Lowering is that nonlow vowels surface as mid in stressed closed syllables and as high elsewhere (Chung 1983). Vowel Lowering applies optionally in syllables that are unstressed in morphologically complex forms, but are under main stress in corresponding forms of lesser morphological complexity. Consider the data in (4).

(4)   Chamorro Vowel Lowering (Chung 1983: 49)

(a)   ['kʷɛntʊs]   'to speak'   [kʷɛn'tusi] or [kʷɪn'tusi]   'to speak to'
(b)   ['lɔklʊk]   'to boil'   [lɔk'lʊkɲa] or [lʊk'lʊkɲa]   'its boiling'

The data in (4) (a) and (4) (b) show that Vowel Lowering may cause an alternation between mid versus high front vowels and mid versus high back vowels, respectively.

Umlaut and Vowel Lowering interact with nonprimary stress in a quite complex manner. Given that the primary focus of the present paper is on the fixed segmentism of the stress-attracting nominalising reduplicant, the details of the interaction with nonprimary stress are for the most part abstracted away from in the remainder of this paper. However, the occurrence of *umlaut* and Vowel Lowering under nonprimary stress is important for the understanding of the vocalism of the base in nominalising and continuative aspect reduplication. In particular, note that Vowel Lowering optionally occurs in the base of continuative aspect reduplication (see also (1) above). Consider the data in (5).

(5)   Optional Vowel Lowering in continuative aspect reduplication

(a)   ['pɛska]   'to fish, to hunt'   (i)   ['pe+pɪska]   'fishing, hunting'
                                           (ii)   ['pe+pɛska]   'fishing, hunting'
(b)   ['kɔnnɪʔ]   'to catch, to take'   (i)   ['ko+kʊnnɪʔ]   'catching, taking'
                                           (ii)   ['ko+kɔnnɪʔ]   'catching, taking'

As shown in (5) (a), [ɪ] and [ɛ] may occur in the reduplicative base of roots such as ['pɛska], whereas (5) (b) shows that [ʊ] and [ɔ] may occur in the reduplicative base of roots such as ['kɔnnɪʔ], resulting in mismatches between the reduplicant vowel and the reduplicative base vowel as in (5) (a) (i) and (5) (b) (i). Importantly, these data show that the reduplicant vowel in Chamorro reduplication may be more faithful to the input root vowel than to the reduplicative base vowel. This type of faithfulness has received much attention in the recent literature on reduplication (Raimy & Idsardi 1997, Spaelti 1997, Struijke 1998, 2000, Yip 2000) and plays a significant role for the analysis of fixed segmentism to be presented below.

Given that the theoretical analysis of the fixed segmentism observed in Chamorro nominalising reduplication to be presented below is based to a significant extent on proposals in Alderete *et al.* (1999), it is useful for the purposes of maximum comparability between our analysis and Alderete *et al.*'s to make analogous assumptions concerning phonological feature specifications. However, given that the feature system used by Alderete *et al.* is not worked out in great depth, a few necessary details must be filled in to get the analysis off the ground.

Alderete *et al.* (1999: 335f.) follow the system of stricture-based features presented in Clements & Hume (1995), but invoke the featural organisation of the Particle Phonology framework (Schane 1984; see also element theory (Harris & Lindsey 1995, among others and Dependency Phonology (Ewen 1995, among others)) in maintaining that mid vowels combine the features of high and low vowels. Given this system of phonological features, the feature specifications for the Chamorro vowel underliers from fig. 1 are presented in (6). Headedness relations among elements must be added to the system outlined in Alderete *et al.* to represent the contrast between /e/ and /a/ in Chamorro. Following conventions in Dependency Phonology, these headedness relations are represented by an underline.

(6)

i	u	e	o	a	ɑ
	[LAB]		[LAB]		
	[DORS]		[DORS]		[DORS]
[COR]		[COR]		[COR]	
		[PHAR]	[PHAR]	[PHAR]	[PHAR]

The table in (6) presents the feature specifications of the Chamorro vowels arising from the stricture-based features [COR], [LAB], [DORS], and [PHAR] assumed in Alderete *et al.* (1999). Given that Alderete *et al.* invoke the featural organisation of Particle Phonology, the mid vowels /e/ and /o/ are both specified for [PHAR]. In addition, note that /e/ and /a/ are both specified through the features [COR] and [PHAR]. Thus, to encode the contrast between /e/ and /a/, we invoke the notion of headedness. Thus, [COR] is the head in the mid front vowel, whereas [PHAR] is the head in the low front vowel. Furthermore, note that both low vowels are headed by [PHAR].

This section has laid out essential preliminaries to the understanding of the Chamorro vowel and stress system. The next section presents a summary of the previous descriptions of the vocalism of nominalising reduplication and identifies issues and open questions that arise from these earlier descriptions.

2. Previous descriptions of nominalising reduplication

Fragments of Chamorro nominalising reduplication have been described in Topping (1973, 1980). Additional data relevant to nominalising reduplication may be found in Topping *et al.* (1975). The purpose of this section is to present the descriptive picture concerning nominalising reduplication according to these sources and to identify issues and open questions arising from this presentation. Note that the representation of the data in this section follows the transcription conventions of the sources.

Topping (1973: 181) characterises nominalising reduplication as follows.

The rule for reduplication for nominalization is to repeat the stressed vowel and preceding consonant (if one is present). The primary stress falls on the first vowel of the reduplicated form. If the stem vowel is back, then it gets fronted.

Topping exemplifies this description of nominalising reduplication with the following data. Note that, in accordance with the default location of primary stress in Chamorro, all of the roots in the data in (7) have primary stress on the penultimate syllable.

(7)   Nominalising reduplication: Data from Topping (1973: 181 f.)

(a)	gupu	'to fly'	gígipu	'flyer'
(b)	adda'	'mimic'	á'adda'	'mimicker'
(c)	kanno'	'eat'	kákanno'	'eater'
(d)	tuge'	'write'	títuge'	'writer'

Note that the apostrophe in Topping's works stands for the glottal stop. Furthermore, note that Topping generally does not transcribe word-initial glottal stop in cases of glottal stop insertion to avoid vowel-initial words in Chamorro. Thus, items such as *adda'* 'mimic' and *á'adda'* 'mimicker' in (7) (b) have a word-initial glottal stop phonetically (cf. Topping 1973: 36).

The data in (7) support three important characteristics of nominalising reduplication. First, these data show that nominalising reduplication employs a CV reduplicant. Secondly, the data in (7) show that the nominalising reduplicant is prefixing. Finally, the data in (7) show that the nominalising reduplicant attracts primary stress onto itself. Given that normally all vowel underliers of Chamorro occur under primary stress, it is expected *ceteris paribus* that all six contrastive vowels of Chamorro are found in the stress-attracting reduplicant of nominalising reduplication. However, the data in (7) (a) and (d) show that this is not the case. Instead, the base vowel /u/ is replaced by [i] in the reduplicant under nominalising reduplication. Note that information regarding the quality of the low vowel in the reduplicant of nominalising reduplication may not be gleaned from the data in (7). This is because the representation of the Chamorro data in Topping (1973) employs for the most part orthographic conventions which do not distinguish between [a] and [ɑ]. Furthermore, note that no items with mid vowels subject to reduplication are presented in the data in (7). Moreover, note that Topping's (1973) statement that back stem vowels get fronted under nominalising reduplication is not conclusively established given the variation in the base observed in (7) (a) versus (7) (d) and the absence of the representation of the contrast between [a] and [ɑ] in (7) (b) and (7) (c).

Topping (1980: 328) expands on the description in Topping (1973) by stating that "if the first vowel of the stem is *o* or *u*, the first vowel of the reduplicated form will be *i*", but illustrates the behaviour of stem *o* only through one example ((8) (a) below). In our search of Topping *et al.* (1975), we have found one more example for the behaviour of stem *o* (see (8) (b)).

(8)   Nominalising reduplication with /o/: Data from Topping *et al.* (1975), Topping (1980)

(a)	godde	'to tie'	i gígedde	'the tier'
(b)	logru	'give odds (gambling)'	lílogru	'odds maker'

The data in (8) show that for bases with /o/ the reduplicant of nominalising reduplication surfaces with the vowel [i]. Thus, the data in (7) and (8) are a good indication for the behaviour of stem *u* and *o*, but do not conclusively illustrate the behaviour of the other vowels of Chamorro under nominalising reduplication. However, some additional data may be gleaned from Topping *et al.* (1975).

Topping *et al.* (1975) distinguish between low front vowels and low back vowels under primary stress through the use of *æ* and *a*, respectively. Thus, data from this work may be used to throw light on the behaviour of low vowels in the reduplicant of nominalising reduplication (cf. (9) (a)).

(9)   Nominalising reduplication: Data from Topping *et al.* (1975)

(a)	(i)	[æ]dda'	'mimic'	[æ]'adda'	'mimicker'
	(ii)	fahan	'buy'	f[æ]fahan	'buyer'
(b)	(i)	li'of	'dive'	líli'of	'diver'
(c)	(i)	penta	'to paint'	pípenta	'painter'
	(ii)	peska	'to fish, to hunt'	pípeska	'fisherman, hunter'
		peska	'to fish, to hunt'	pépeska	'fisherman, hunter'
	(iii)	bende	'to sell, to vend'	bíbende	'shopkeeper, seller'
	(iv)	de'on	'pinch, tweak'	déde'on	'pincher'

The data in (9) (a) show that low vowels appear as the front low vowel in the reduplicant of nominalising reduplication regardless of the location of the base low vowels along the front-back dimension. Note that there are a sizeable number of additional examples with low stem vowels behaving like the data in (9) (a) to be found in Topping *et al.* (1975). The datum in (9) (b) indicates that for bases with /i/ the reduplicant of nominalising reduplication appears as [i]. Note that there is one more example of this kind to be found in Topping (1980). The data in (9) (c) show variation with respect to the behaviour of base /e/ in the reduplicant of nominalising reduplication. The data in (9) (c), (i-iii) show that base /e/ may licence [i] in the reduplicant. On the other hand, the data in (9) (iv) and the variant *pépeska* 'fisherman, hunter' in (9) (c) (ii) suggest that base /e/ may appear as [e] in the reduplicant as well. Note that whereas the data with base /e/ shown in (9) (c) seem to exhibit variation under nominalising reduplication, there are too little data available from the previous literature to establish this conclusion firmly. In addition, it must be noted that the behaviour of base /e/ has not been explicitly described in any of Topping's works.

For all of the data in (7)-(9), it must be noted that the vowel quality of the base vowels in the reduplicant is represented through orthographic convention rather than phonetic transcription. This leaves the phonetic quality of the base vowels in the reduplicated forms underdetermined in two respects. First, it is not clear from the orthography which allophone of the low vowels appears initially in bases like <adda'> 'to mimic' to reduplicated forms such as <[æ]'adda'> 'mimicker'. Secondly, given that mid vowels alternate with high vowels under nonprimary stress, the orthography employed in Topping's works glosses over the phonetic height of the vowels in bases such as <penta> 'to paint' in reduplicated forms such as <pípenta> 'painter'.

Topping (1973) has advanced the following explanation for the restricted inventory of vowels observed in the reduplicant of nominalising reduplication.

> [T]he stressed vowel of the reduplicated form is fronted because the nominalized form is usually preceded by the article *i*. It will be recalled that *i* causes vowel fronting, as in *guma'* 'house', *i gima'* 'the house'. It does not seem feasible to try to account for the vowel fronting as the result of reduplication. (Topping 1973: 182)

Topping's statement is problematic from three perspectives. First, the data presented above suggest that the vowel inventory of the reduplicant of nominalising reduplication is limited to [i] and [a] and is, thus, not accounted for as a simple vowel fronting. Descriptively speaking, vowel raising seems to be involved as well, given that /o/ and /e/ appear to surface as [i]. Secondly, the observed fronting and raising does not seem to depend on the presence of the determiner *i* 'the', given that the vast majority of the reduplication data in Topping (1973) and Topping *et al.* (1975) appear without this determiner. Finally, vowel fronting as observed in the nonreduplicative phonology of Chamorro results in an /o/-[e] alternation for mid vowels, whereas /o/ in Topping's nominalising reduplication data appears to alternate with [i].

In sum, the data from the previous sources suggest that the vowels that may appear in the prefixal stress-attracting CV reduplicant of nominalising reduplication are limited to *i* and *æ* where *i* occurs with nonlow base vowels and *æ* occurs with low base vowels. However, this generalisation is not firmly established because there are few data available for

nonlow base vowels and because some data points appear to show reduplicant *e* with the base vowel *e*. In addition, the orthographic conventions employed in Topping's works prevent any firm conclusions as to the quality of the vowels in the bases of the reduplicated forms. Furthermore, Topping's claim that the restriction observed in the reduplicant vowels is due to *umlaut* or vowel fronting induced in the reduplicant by the determiner *i* is questionable in light of the fact that most of the data from nominalising reduplication presented in Topping's works appear without the determiner and that [e] appears at best inconsistently in the reduplicant. The data from our field research to be presented in the next section have been collected to shed light on these issues.

3. Vocalism in nominalising reduplication

The previous section has worked out three underinvestigated issues in the vocalism of Chamorro nominalising reduplication. First, the set of vowels that may appear in the nominalising reduplicant needs to be established with a greater degree of certainty than is possible from the existing sources. Secondly, the quality of the initial base vowels in reduplicated forms needs to be scrutinised. Finally, it is questionable that the restrictions concerning the vowels in the nominalising reduplicant are caused by the *umlaut*-inducing determiner *i*. The data from our fieldwork presented in this section contribute to the resolution of these issues.

It is shown in this section that nominalising reduplication is a case of fixed segmentism in that only [i] and [a] may occur as vowels in the nominalising reduplicant. Furthermore, it is shown that reduplicant [i] occurs only with nonlow root vowels and that [a] occurs only with low root vowels. This pattern is interesting for two reasons. First, given that usually the full inventory of Chamorro vowels is displayed under primary stress, it is surprising to find that the stress-attracting nominalising reduplicant is severely restricted as to the quality of vowels that may occur in it. Secondly, the dependence of the occurrence of the two reduplicant vowels on the height of the root vowel is of interest because this type of reduplicative pattern does not seem to have been found elsewhere to this point. Thus, the inventory and the distributional restrictions on the vowels in the nominalising reduplicant require a novel explanatory account. As an empirical prerequisite to establishing the case for fixed segmentism, one must compare the vowels found in the reduplicant with the vowels in the unreduplicated roots and in the bases of reduplication. Given the data in this section, there is consistent evidence for a systematic mismatch between the vowels in the reduplicant and the vowels in the corresponding roots and reduplicative bases.

The data for the present study are extracted from face-to-face interviews with six native speakers of Chamorro conducted on location on Guam in the Summer of 1999. All speakers are natives of the island of Guam and the group of speakers is composed of three women and three men with ages ranging from late twenties to mid sixties. The interviews were conducted by the authors of the present study using primarily translation-elicitation techniques to elicit Chamorro target items. All interviews took place in a quiet room and were recorded using a high-quality tie-clip microphone and a high-quality portable digital audio tape (DAT) recorder. The data from the DAT tapes were copied to analogue tape to provide a working copy of the material. The data from the analogue tapes were then digitised and analysed using standard software packages for speech analysis. The data presented below were obtained through auditory analysis of the digital sound files. This analysis was performed independently by the two authors of this study. The transcriptions of our data presented below follow IPA conventions. Consider now the data in (10) and (11).

(10)   Root vowel /i/

      (a)   ['liʔɪʔ]   'to see'   ['li+liʔɪʔ]   'seer'
      (b)   ['ʔipɪʔ]   'to slice'   ['ʔi+ʔipɪʔ]   'slicer'
      (c)   [ʔɪs'tudja]   'to study'   ['ʔi+ʔɪstudja]   'studyer'

(11)   Root vowel /u/

    (a)   ['gupu]   'to fly'   (i)   ['gi+gipu]   'flyer'
                                            (ii)   ['gi+gupu]   'flyer'
    (b)   ['tugɪʔ]   'to write'   ['ti+tigɪʔ]   'writer'

The data in (10) and (11) show that with high root vowels the reduplicant vowel is [i] regardless of whether the root vowel is front /i/ or back rounded /u/. Note that the base vowel in the initial syllable of the reduplicated form is high and front whenever the root vowel in the same position is high and front. However, we observe an optional alternation in the quality of the first base vowel if the corresponding root vowel is /u/. In such cases, /u/ may alternate with [i], as the comparison between (11) (a) (i) versus (11) (a) (ii) exemplifies. We suggest that this alternation in the base is analogous to the vowel fronting or *umlaut* alternation observed in the nonreduplicative phonology of Chamorro. Consider now the data in (12) and (13).

(12)   Root vowel /e/

    (a)   ['ʔɛggaʔ]   'to watch'   ['ʔi+ʔɪggaʔ]   'watcher'

    (b)   ['pɛska]   'to fish, to hunt'   (i)   ['pi+pɪska]   'fisherman'
                                                (ii)   ['pi+pɛska]   'fisherman'

(13)   Root vowel /o/

    (a)   ['kɔnnɪʔ]   'to catch'   (i)   ['ki+kɪnnɪʔ]   'catcher'
                                                (ii)   ['ki+kɛnnɪʔ]   'catcher'
                                                   (iii) ['ki+kʊnnɪʔ]   'catcher'
                                                  (iv) ['ki+kɔnnɪʔ]   'catcher'

    (b)   ['kɔʔkɔʔ]   'to harvest'   (i)   ['ki+kɔʔkɔʔ]   'harvester'
                                                (ii)   ['ki+kɛʔkɔʔ]   'harvester'

The data in (12) and (13) show that mid root vowels appear with the reduplicant vowel [i] in nominalising reduplication. In other words, mid vowels appear to be banned from the reduplicant and [i] is observed instead. Thus, the data in (12) and (13) show that roots with initial high and mid vowels tolerate only [i] in the reduplicant of nominalising reduplication. Furthermore, analogous to (11), the data in (13) also show optional vowel fronting of the back vowel in the reduplicative base. In particular, compare the front vowels found in the reduplicative bases in (13) (a) (i) and (ii) and (13) (b) (ii) with the corresponding back vowels in (13) (a) and (b). Moreover, the data in (12) and (13) also show systematic variation in the vowel height in the closed initial syllables of the reduplicative bases. Thus, the initial high vowels in the bases in (13) (a) (i) and (iii) alternate with the corresponding mid vowels in (13) (a) (ii) and (iv). We suggest that this alternation is analogous to the Vowel Lowering alternation observed in the nonreduplicative phonology of Chamorro. Note that the combined effects of optional Vowel Lowering and vowel fronting may produce four different variants of root /o/, as seen in (13) (a).

    The upshot of the data in (10) through (13) is that the vowel in the prefixing nominalising reduplicant is [i] regardless of whether the initial root or base vowel is [i]/[ɪ], [u]/[ʊ], [ɛ] or [ɔ]. Consider now the data on low vowels in (14) and (15).

(14)   Root vowel /a/

    (a)   ['ʔadzɪk]   'to choose'   ['ʔa+ʔadzɪk]   'chooser'
    (b)   ['ʔaddaʔ]   'mimic'   ['ʔa+ʔaddaʔ]   'mimicker'

(15)   Root vowel /ɑ/

(a)	['kannʊʔ]	'to eat'	['ka+kannʊʔ]	'eater'
(b)	['fahan]	'to buy'	['fa+fahan]	'buyer'
(c)	[ʔa'pasi]	'to pay'	['ʔa+ʔapɑsi]	'payer'
(d)	['katsaʔ]	'to husk a coconut'	['ka+kətsaʔ]	'coconut husker'

The data in (14) and (15) show that low root vowels appear with the reduplicant vowel [a] under nominalising reduplication. In other words, the front low vowel [a] reflects the low height of the root vowel in the nominalising reduplicant regardless of whether the root low vowel is front or back. Furthermore, note that the initial base vowel may appear as [a] or [ə]. There are two crucial points to be taken away from the data in (14) and (15). First, the lowness of the reduplicant vowel corresponds to the lowness of the initial root vowel, but not always to the vowel in the reduplicative base. Secondly, the reduplicant is low front [a] regardless of whether there is /a/ or /ɑ/ in the initial syllable of the root. This is in sharp contrast to the occurrence of [i] in the reduplicant with nonlow root or base vowels observed earlier.[1]

The data in (10)-(15) show without a doubt that the vowels in the stress-attracting reduplicant of Chamorro nominalising reduplication are limited to [i] and [a]. In addition, the data in (10)-(13) show that [i] appears as the reduplicant vowel with nonlow root vowels, that is, /i/, /u/, /e/ and /o/. In contrast, the data in (14) and (15) show that the reduplicant vowel is [a] if the root vowel is a low vowel, that is, /a/ or /ɑ/. Furthermore, data such as (15) (d) show that the lowness of the reduplicant vowel is not always copied from the reduplicative base, but instead may be carried over from the input root. Thus, the six vowel system under primary stress in the nonreduplicative phonology of Chamorro is reduced to a two vowel system under primary stress in the nominalising reduplicant. Note in particular that reduplicant [i] occurs consistently with mid vowel roots, as the data in (12) and (13) show.[2] The table in (16) graphically displays these results.

(16)   Vocalism of Chamorro nominalising reduplication

Root	Reduplicant	Base
/i/, /e/, /u/, /o/	[i]	[i]/[ɪ], [ɛ], [u]/[ʊ], [ɔ]
/a/, /ɑ/	[a]	[a], [ə]

The data in (10)-(15) have all been produced by the speakers of Chamorro without the determiner *i*. Thus, Topping's idea that the segmental restrictions in the nominalising reduplicant are observed because vowel fronting or *umlaut* must be induced by the determiner *i* is shown to be unfounded. Furthermore, given the limitation of the vowels in the nominalising reduplicant to [i] and [a], the set of vowels produced by *umlaut* is at odds with the set of vowels appearing under fixed segmentism in nominalising reduplication. Thus, *umlaut* results in high, low, and mid front vowels whereas only high and low front vowels may occur in the reduplicant of nominalising reduplication. In sum, the fixed segmentism observed is an integral part of the morphophonological process of nominalising reduplication and not induced by *umlaut*. Interestingly, though, the nominalising reduplicant itself appears to be an *umlaut*-inducing element in that umlauted vowels may appear in the initial syllable of the reduplicative base. Thus, the nominalising reduplicant needs to be

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[1] Note that the variable appearance of [a] versus [ə] in the initial vowel in the reduplicative base corresponding to an initial low vowel in the root observed in (15) is probably due to variable secondary stress versus no stress, respectively, in adjacency to the main-stressed reduplicant. The details of the issue of the level of stress in reduplicative stems are left for future work.

[2] There is one exception to this generalisation in the corpus under consideration. Thus, ['ʔɛntaluʔ] 'to interfere' was nominalised as ['ʔe+ʔɛntaluʔ] 'interferer' in one instance.

added to the list of *umlaut*-inducing elements compiled in the earlier literature on Chamorro *umlaut* (Topping 1968, Chung 1983, Klein 2000).

In sum, the data presented in this section show that the nonlow root vowels are optionally affected by *umlaut* or Vowel Lowering in the reduplicative base. In addition, low root vowels appear as [a] or may be reduced to schwa in the reduplicative base. Furthermore, we have seen that the marked reduplicant vowel [a] occurs in correspondence to low vowels in the initial root or base syllable. Finally, the unmarked reduplicant vowel [i] occurs elsewhere, that is with initial high or mid root vowels. Thus, markedness in the reduplicant vowel is decreased unless overruled by faithfulness to the input or the reduplicative base in terms of vowel lowness. These findings are the empirical backdrop for the OT analysis of fixed segmentism in Chamorro nominalising reduplication presented in the next section.

4. Fixed segmentism, markedness and faithfulness

The preceding description of the fixed vocalism in the reduplicant of Chamorro nominalising reduplication has shown that the vowel in the nominalising reduplicant is [a] if the first root or base vowel is a low vowel, but appears as [i] elsewhere. This pattern clearly incorporates a reduction in phonological markedness in that /u/ plus the cross-linguistically marked vowels /e/, /o/, and /ɑ/ are banned from appearing in the nominalising reduplicant even though this reduplicant is under primary stress. To capture this pattern we propose that the appearance of [a] is due to two factors. First, the lowness of the vowel in the root or the base is matched in the reduplicant through word or base-reduplicant faithfulness, respectively. Secondly, /ɑ/ is excluded through markedness so that only the front low vowel of the two low vowels is available to appear in the reduplicant. In all other environments, unmarked *i* is the default vowel in the reduplicant of nominalising reduplication.

This section is organised as follows. §4.1. explores the connection between the fixed segmentism observed in Chamorro nominalising reduplication, vowel inventories in other languages and the question of default vowel phonology in Chamorro. §4.2. is an initial demonstration of the effects of the markedness constraint hierarchy of Alderete *et al.* (1999) in relation to the markedness reduction observed in the vocalism of the nominalising reduplicant. In §4.3. we show the necessity of word faithfulness in the sense of Struijke (2000) and the usefulness of base-reduplicant faithfulness to account for the phonology of low vowels in nominalising reduplication. §4.4. rounds out the analysis by showing how unmarked [i] emerges as the reduplicant vowel in the correct environments.

4.1. Fixed segmentism, default phonology and vowel inventories

Alderete *et al.* (1999) base their framework on three generalisations concerning the relation between reduplicative morphemes and segmental inventories. These generalisations are reproduced in (17)-(19) (cf. Alderete *et al.* 1999: 332f.).

(17) Reduplicant/Inventory relation I
      Except when copying the base, the reduplicant's inventory is a proper subset of the whole language's.
(18) Reduplicant/Inventory relation II
      Any phonological restriction on the whole of one language is a possible restriction on the reduplicant of another language.
(19) Reduplicant/Inventory relation III
      Any phonological restriction on the reduplicant of one language is a possible restriction on the whole of another language.

The case of fixed segmentism in Chamorro nominalising reduplication falls under the generalisation in (17) in that the vowel inventory of the nominalising reduplicant is a subset of the vowel inventory of Chamorro as a whole. Given the phonological nature of fixed

segmentism in Chamorro nominalising reduplication, the fact that only part of the Chamorro vowel inventory is observed in the nominalising reduplicant must be due to some kind of phonological restriction. Consequently, in accordance with the generalisations in (18) and (19), Alderete *et al.*'s (1999) framework predicts that the restriction of the Chamorro nominalising reduplicant to [i] and [a] must be matched as some aspect of the phonology of Chamorro itself or as a restriction on the non-reduplicative phonology of another language.

Alderete *et al.* (1999) discuss two general areas in which segmental restrictions on reduplicants may be met in the nonreduplicative phonology of the same language or some other language, namely, default segmentism and segmental inventories. Consequently, we investigate if the restriction to [i] and [a] is matched as some kind of default segmentism in Chamorro or if the restriction is mirrored as a vowel inventory in other languages.

The most obvious candidates for default vowel phonology are vowel insertion and vowel reduction under nonprimary stress. Chamorro is not attested to have any process of vowel insertion so that the vowel inventory of nominalising reduplication may not be compared to vowel insertion. As far as vowel reduction is concerned, we have seen in §1 that Chamorro displays stress reduction only in the inventory of low vowels that may occur under nonprimary stress. Thus, one option is for /a/ and /ɑ/ to merge to [a] under secondary stress and to [ɑ] in unstressed position. The other option for the low vowels is the reduction to [ə] in unstressed position. Importantly, all high and mid vowels may occur under secondary stress and in unstressed position in the nonreduplicative phonology of Chamorro. Thus, the pattern of vowel reduction displayed in the nonreduplicative phonology of Chamorro does not match the vowel inventory of the nominalising reduplicant.

As far as the comparison between the vowel inventory under nominalising reduplication and the vowel inventories of other languages is concerned, there appear to be languages whose nonschwa vowel inventory matches the vowel inventory of the Chamorro nominalising reduplicant. Thus, the literature reports on languages in which the inventory of contrastive nonschwa vowels consists of just /i/ and /a/. Such vowel inventories have been reported for Margi (Ladefoged & Maddieson 1996: 286) and Iatmul and Abelam (Foley 1986: 49). In what follows, languages with this type of vowel inventory are referred to as *MIA languages*. It appears then, that the restricted vowel inventory of Chamorro nominalising reduplication is matched by the vowel inventory of MIA languages in that in both sets of inventories round or back vowels are not allowed and in that nonschwa vowels are maximally dispersed along the height dimension, resulting in the absence of noncentral mid vowels in both sets of inventories. Thus, it may be concluded that Alderete *et al.*'s (1999) generalisations (18) and (19) are confirmed in that the restrictions on the vowel inventory of Chamorro nominalising reduplication are mirrored as the vowel inventories of MIA languages and vice versa.

4.2. Markedness decrease in Chamorro fixed segmentism

As laid out above, the fixed segmentism in Chamorro nominalising reduplication is a markedness decrease in the sense that the unmarked vowel [i] occurs in the reduplicant unless this is overruled by faithfulness to a low vowel in the root or the base. In OT, segmental markedness is expressed through universal hierarchies of markedness constraints. The universal markedness hierarchy concerning place invoked by Alderete *et al.* (1999) is given in (20). Recall that Alderete *et al.* assume, following Clements & Hume (1995), that vowels bear the same place features as consonants.

(20)   Place-markedness hierarchy (Alderete *et al.* 1999: 335)
        *PL/LAB, *PL/DORS >> *PL/COR >> *PL/PHAR

According to the hierarchy in (20), round and back vowels are more marked than high front vowels which in turn are more marked than low vowels. Importantly, recall Alderete *et al.* follow the idea that mid vowels are specified by the features [COR] and [PHAR]. Thus, according to Alderete *et al.*, the hierarchy in (20) always induces worse marks for any mid

vowel than its peripheral counterparts because mid vowels violate the constraints *PL/COR and *PL/PHAR. Furthermore, Alderete *et al.* (1999: fn. 9) allude to the fact that dispersion effects also militate against mid vowels. For the purposes of this paper, we capture the markedness of mid vowels through the constraint *E/*O given in (21).

(21)   *E/*O: Mid vowels are prohibited.

The tableau in (22) shows the effects of the hierarchy of markedness constraints from (20) and (21) on vowels in the reduplicant. In tableau (22), we abstract away from the segmental form of the base of reduplication to bring out the effects of the constraint hierarchy on reduplicant vowels more clearly.

(22)

		*PL/LAB	*PL/DORS	*E/*O	*PL/COR	*PL/PHAR
☞	a. Ci_Red+base				*	
	b. Cu_Red+base	*!	*			
	c. Ce_Red+base			*!	*	*
	d. Co_Red+base	*!	*	*		*
☹	e. Ca_Red+base				*	*!
	f. Cɑ_Red+base		*!			*

The tableau in (22) shows the violations of the markedness constraints incurred by vowels, given the feature specifications of the Chamorro system of six vowel underliers laid out in §1. All round, back and mid vowels including [ɑ] are suboptimal in this system because they violate the high-ranking constraints *PL/LAB, *PL/DORS or *E/*O, respectively. Furthermore, [a] violates *PL/COR and *PL/PHAR and is, thus, suboptimal in comparison to [i] which only violates *PL/COR. Thus, the markedness constraint hierarchy in (22) renders [i] optimal to the exclusion of all other Chamorro vowel underliers. This result is only partially desirable, as shown by the sad face next to viable candidate (22) (e). It captures the idea that [i] emerges in the reduplicant because it is the least marked underlier vowel of Chamorro. However, this system cannot license the appearance of [a] properly. Thus, the constraint hierarchy in (22) must be enhanced by constraints that favour [a] in the correct environments. We propose that two faithfulness relations are needed to capture the appearance of [a] in the reduplicant correctly. The first one demands a match in vowel lowness between input root and reduplicative word; the second one demands a match in vowel lowness between reduplicant and reduplicative base. We address these faithfulness relations in turn in the following section.

4.3. Word faithfulness and base-reduplicant faithfulness

The data presented in this paper have shown ample evidence that reduplicant vowels in Chamorro may be more faithful to the input root than to the output reduplicative base. Thus, in continuative aspect reduplication mid vowels appear in the reduplicant with mid vowel roots even though the reduplicative base may contain a high vowel in these cases (cf. ['kɔnniʔ] 'to catch, to take' versus ['ko+kʊnniʔ] 'catching, taking'). Furthermore, we have seen that the low vowel [a] appears in the reduplicant of nominalising reduplication with low vowel roots even though the reduplicative output base may contain a local schwa (cf. ['katsaʔ] 'to husk a coconut' versus ['ka+kətsaʔ] 'coconut husker'). This type of pattern in which the reduplicant morpheme appears to be more faithful to the input root than to the output reduplicative stem has been the subject of extensive discussion in the recent literature (Raimy & Idsardi 1997, Spaelti 1997, Struijke 1998, 2000; see also Yip 2000). To a significant extent, these works converge on the idea that, in order to capture the type of input-reduplicative word faithfulness displayed in Chamorro and other languages, reduplication must be understood as the fission of an input root where faithfulness to the input may be satisfied in the whole of the reduplicative output, rather than just the

reduplicative base. This is in sharp distinction to the full model of correspondence in McCarthy & Prince (1995) in which input-reduplicant faithfulness is captured through the cross-morphemic correspondence between input and reduplicant (see Raimy & Idsardi 1997 and Spaelti 1997 for arguments against this approach). For the purposes of this paper, we invoke Struijke's (2000) model in which there are three correspondence relations as displayed in fig. 2.

input: /**RED+Root**/

Word Faithfulness

Root Faithfulness

output: Reduplicant ⟷ Base
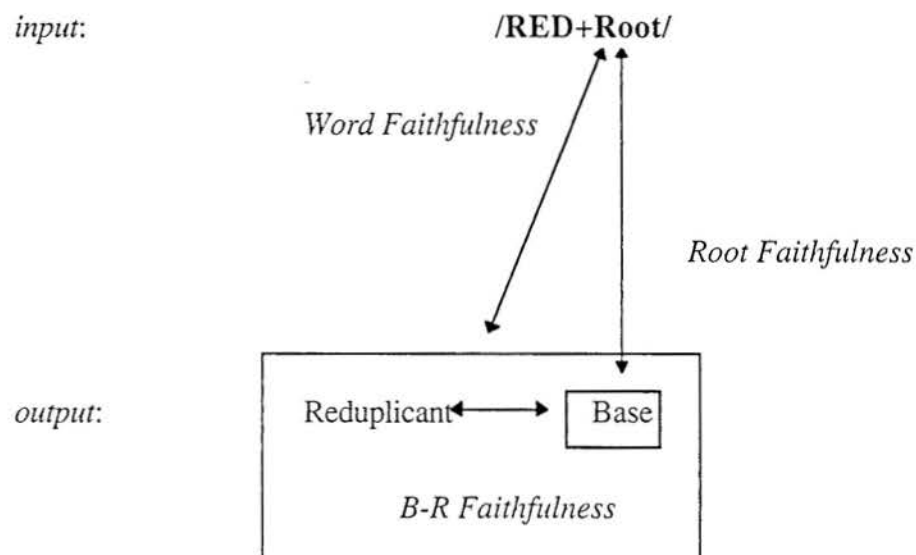
B-R Faithfulness

Fig. 2. Model of Correspondence with Word Faithfulness (Struijke 2000)

BR faithfulness in fig. 2. is analogous to BR faithfulness in McCarthy & Prince (1995). The difference lies in the conception of root faithfulness and word faithfulness. Root faithfulness is satisfied if an input element is matched in the reduplicative base. In contrast, word faithfulness (cf. MAX_{WD} in (23) below) is satisfied if an input element is matched anywhere in the word, that is, either in the reduplicant or in the base. A more specific faithfulness constraint utilising this correspondence relation is exemplified in (24) (cf. Struijke 2000).

(23) MAX_{WD}: Every segment in the input has some correspondent in the output word.

(24) ID-$FEATURE_{WD}$:   If a segment S is [αF] in the input, then some correspondent of S is
                          [αF] in the output.

Given constraints of the general form in (24), it is clear that reduplicative items such as ['ka+kətsaʔ] 'coconut husker' formed from the root ['katsaʔ] 'to husk a coconut' satisfy a constraint that demands matching low vowels in input and reduplicative word. This constraint is formulated in (25).

(25) ID-[PHAR]$_{WD}$:   If a segment S is [PHAR] in the input, then some correspondent of S
                          is [PHAR] in the output.

The constraint in (25) demands that headedness by the feature [PHAR] in any given input segment must be matched as headedness by the feature [PHAR] in some segment of the output word. While this constraint is shown below to contribute significantly to the account of low vowel matching in Chamorro nominalising reduplication, it is obvious that this constraint captures only a subset of the input-word correspondence relations in Chamorro continuative aspect reduplication. For reasons of space, we leave the analysis of input-word correspondence in nominalising versus continuative aspect reduplication as a task for future

research and, consequently, focus on the analysis of nominalising reduplication in the remainder of this paper.

Recall from tableau (22) in section 4.2. that the place-markedness hierarchy by itself favours fixed [i] to the exclusion of matching [a]. Thus, the task is to show how the proper ranking of the input-word correspondence constraint ID-[PHAR]$_{WD}$ contributes to the account of faithfulness to the lowness of input vowels in nominalising reduplication.

(26)	Input: RED+/katsaʔ/	*PL/DOR	ID-[PHAR]$_{WD}$	*PL/COR	*PL/PHAR
☞	a. [ˈka$_{Red}$+kətsaʔ]	*		*	**
	b. [ˈki$_{Red}$+kətsaʔ]	*	*!	*	*
	c. [ˈka$_{Red}$+kətsaʔ]	**!			**

All candidates in (26) incur a violation of *PL/DOR because of the faithful rendition of the final input low back vowel. However, the low back vowel in the reduplicant in (26) (c) is suboptimal because it incurs an additional, fatal violation of *PL/DOR. Reduplicant [i] as in (26) (b) is suboptimal with low vowel roots because it incurs a fatal violation of the constraint ID-[PHAR]$_{WD}$. Thus, ID-[PHAR]$_{WD}$ is violated in (26) (b) because the lowness of the first root vowel does not have a match anywhere in the reduplicated word. In sharp contrast, (26) (a) passes ID-[PHAR]$_{WD}$ because the lowness of the first root vowel /a/ is matched through the lowness of the reduplicant vowel [a]. Note that the change along the horizontal dimension is forced in the reduplicant through the high ranking of the place-markedness constraint *PL/DOR. In short, [a] is correctly favoured over [i] as the reduplicant vowel with low input vowels because it incurs the fewest violations of the high-ranking constraints *PL/DOR and satisfies the constraint ID-[PHAR]$_{WD}$, thus overruling the unmarkedness of [i].

The constraint hierarchy motivated to this point is not able to account for the preference for the reduplicant vowel [a] in cases in which the low vowel of the root surfaces as a low vowel in the reduplicative base. Consider tableau (27).

(27)	Input: RED+/ʔapasi/	ID-[PHAR]$_{WD}$	*PL/COR	*PL/PHAR
	a, [ˈʔa$_{Red}$+ʔapasi]		***	***!
☹	b. [ˈʔi$_{Red}$+ʔapasi]		***	**

If all low vowels of the input root are matched as low vowels in the reduplicative base, such candidates pass the constraint ID-[PHAR]$_{WD}$, leaving the decision between the reduplicant vowels [i] and [a] to the place-markedness constraints. Given that the place-markedness hierarchy favours [i] over [a], the incorrect result obtains with low vowel roots, as shown through the comparison of (27) (a) with (27) (b). To resolve this situation we invoke the general faithfulness constraint MAXBR (cf. McCarthy & Prince 1995).

(28) MAXBR: Every segment of the base has a correspondent in the reduplicant.

The constraint MAXBR demands that all segments in base and reduplicant must match. Consider now the tableau in (29).

(29)	Input: RED+/ʔapasi/	ID-[PHAR]$_{WD}$	*PL/COR	MAXBR	*PL/PHAR
☞	a. [ˈʔa$_{Red}$+ʔapasi]		***		***
	b. [ˈʔi$_{Red}$+ʔapasi]		***	*!	**

Both candidates in tableau (29) pass the constraint ID-[PHAR]$_{WD}$ because the low vowels in the input root appear as low vowels in the reduplicative base. Furthermore, both candidates

in (29) violate the constraint *PL/COR in equal measure because they contain three front vowels each. Crucially, candidate (29) (b) fatally violates the constraint MAXBR because the vowel in the CV reduplicant in (29) (b) does not match the appropriate vowel in the base. Consequently, candidate (29) (a) correctly emerges as optimal even though its three low vowels incur more violations of the constraint *PL/PHAR than its competitor (29) (b).

In the preceding paragraphs we have shown that the appearance of the reduplicant vowel [a] with low vowel roots must be accounted for through correspondence relations between the input and the reduplicative word and between the reduplicant and the base. It remains to be shown how [i] emerges in this system as the reduplicant vowel with roots and bases containing nonlow vowels.[3]

4.4. The emergence of unmarked [i]

In this subsection we show that [i] emerges as the reduplicant vowel with nonlow vowel roots and bases because the general MAXBR constraint requiring faithfulness of all segments in the base-reduplicant relation is ranked quite low.

(30)

Input: RED+/peska/	*E/*O	ID- [PHAR]_WD	*PL/COR	MAXBR	*PL/PHAR
☞ a. ['pi_Red+peska]	*		**	*	**
b. ['pe_Red+peska]	**!		**		***
c. ['pa_Red+peska]	*		**	*	***!

The reduplicant vowel [e] with roots or bases containing initial front mid vowels is correctly suboptimal with nominalising reduplication through the high ranking of the markedness constraint *E/*O, as shown in candidate (30) (b). The comparison between candidate (30) (a) and (30) (c) shows that the decision between these two candidates cannot be made by the constraints ID-[PHAR]_WD, *PL/COR or MAXBR. Both candidates pass ID-[PHAR]_WD because the input low vowel is represented faithfully in the output. Furthermore, both candidates violate *PL/COR equally because they contain the same number of front vowels. Moreover, (30) (a) and (30) (c) violate MAXBR equally because the initial base vowel does not match the reduplicant vowel in either of the candidates. Thus, the decision is passed along to the low-ranked markedness constraint *PL/PHAR. Candidate (30) (c) incurs more violations of this constraint than (30) (a) because the low reduplicant vowel in (30) (c) incurs a violation of *PL/PHAR that is not present for the reduplicant vowel [i] in (30) (a). Thus, candidate (30) (a) correctly emerges as optimal. For the sake of completeness, tableaux for nominalising reduplication with the remaining input vowels are presented in (31) to (33).

(31)

Input: RED+/li?ɪ?/	*PL/COR	MAXBR	*PL/PHAR
☞ a. ['li_Red+li?ɪ?]	***		
b. ['la_Red+li?ɪ?]	***	*!	*

(32)

Input: RED+/gupu/	*PL/COR	MAXBR	*PL/PHAR
☞ a. ['gi_Red+gupu]	*	*	
b. ['ga_Red+gupu]	*	*	*!

---

[3] Note that our analysis abstracts away from a number of issues in nominalising reduplication peripheral to our present concerns including the CV shape of the nominalising reduplicant and its stress-attracting nature.

(33)

Input: RED+/kɔnnɪʔ/	*PL/COR	MAXBR	*PL/PHAR
☞ a. [ˈki_Red+kɔnnɪʔ]	**	*	
b. [ˈka_Red+kɔnnɪʔ]	**	*	*!

The tableaux in (31)-(33) demonstrate that the reduplicant vowel [i] is always favoured over the reduplicant vowel [a] with roots and bases with nonlow vowels either because reduplicant [a] fatally violates MAXBR or because it fatally violates *PL/PHAR.

Given the discussion in this paper, the phonology of the Chamorro nominalising reduplicant vowel is accounted for through the constraint hierarchy given in (34).

(34)   Summary of constraint hierarchy
   *PL/LAB, *PL/DORS, *E/*O >> ID-[PHAR]_WD >> *PL/COR >> MAXBR >> *PL/PHAR

Given high-ranking constraint(s) ensuring that consonants are copied faithfully in Chamorro reduplication, the high ranking of *PL/LAB, *PL/DORS and *E/*O eliminates round, back and mid vowels from the nominalising reduplicant. The proper ranking of ID-[PHAR]_WD accounts for the fact that the reduplicant vowel is low with low vowel roots even if the adjacent base vowel is reduced to schwa. Given the feature specifications of Chamorro vowels in §1, the constraint *PL/COR cannot decide between the reduplicant vowels [i] and [a]. The decision for a matching reduplicant vowel falls to MAXBR if the base vowels are low or high and front. In the remaining cases, *PL/PHAR favours [i] as the reduplicant vowel because [a] incurs a violation of *PL/PHAR that [i] does not.

5. Conclusion

The data from our fieldwork presented in this paper have contributed towards a complete description of Chamorro nominalising reduplication and have provided ample evidence for fixed segmentism in nominalising reduplication. Thus, the vowel in the prefixing reduplicant of nominalising reduplication is low front [a] if the first vowel of the input root or the output base is a low vowel, whereas the vowel in the reduplicant is [i] if the first vowel in the root or the base is a nonlow vowel. Furthermore, in line with the predictions of Alderete *et al.* (1999), the restriction of the vowel inventory of the Chamorro nominalising reduplicant to [i] and [a] has been shown to be matched as nonschwa vowel inventories in the phonology of other languages such as Margi, Iatmul and Abelam. In addition, in contrast to earlier descriptions, we have shown that the vocalism of the nominalising reduplicant is not caused by *umlaut*/vowel fronting and does not depend on the presence of the determiner *i*. Instead, the vocalism of the reduplicant in nominalising reduplication has been shown to be an integral part of the morphophonological process of reduplication. Furthermore, the vocalism of the base in nominalising reduplication has been shown to be influenced by Vowel Lowering and by *umlaut* induced by the reduplicant itself.

The fixed segmentism in Chamorro nominalising reduplication has been shown to be a case of markedness reduction with some interesting complexities. Markedness straightforwardly excludes back, round and mid vowels from the stress-attracting nominalising reduplicant although such vowels are part of the phonology of Chamorro elsewhere. However, the appearance of [a] versus [i] in the reduplicant depends on the height of the root or base vowel. Thus, the cross-linguistically marked low front vowel [a] appears if there is a local low vowel in the root or the base, whereas the unmarked vowel [i] appears only if there is no local low vowel in the input or in the base of reduplication. In this respect, the preference for reduplicant [i] is a case of the emergence of the unmarked in the sense of McCarthy & Prince (1994).

The appearance of [a] in nominalising reduplication has been shown to be cued by faithfulness to the reduplicative base and to the input to reduplication. Whereas the model proposed in Alderete *et al.* (1999) has been shown to be well-suited to account for the

markedness reduction observed in the fixed segmentism of Chamorro nominalising reduplication, their model cannot account for the fact that reduplicant vowels in Chamorro under certain conditions take their cue from the input to reduplication rather than the reduplicative output. We have proposed to resolve this issue by integrating recent models of correspondence theory, in particular Struijke (2000), into the markedness reduction framework for fixed segmentism. Thus, the proper ranking of a word faithfulness constraint accounts for the appearance of [a] in the nominalising reduplicant even if there is no local low vowel in the reduplicative output. Clearly, the relation between fixed segmentism, markedness and faithfulness needs to examined further in future work. Other issues arising from the present paper that are well worth further investigation include the account of *umlaut* and Vowel Lowering in the reduplicative base of nominalising reduplication, the analysis of stress in reduplication and the analysis of continuative aspect reduplication in Chamorro.

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An Interpretation of the Voice Affix /i-/ in Tagalog

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1 Introduction

In Tagalog, the main dialect spoken in the Philippines, at least five voice affixes (VA) can be distinguished: the two Actor voice (AV) affixes /um-/ and /mag-/, that are both prefixes, and the three Undergoer voice (UV) affixes /-in/ (UV_1), /i-/ (UV_2) and /-an/ (UV_3), the first and third of which are suffixes whereas /i-/ is a prefix.

Voice Affixes

ACTOR VOICE (AV)	UNDERGOER VOICE (UV)
/um-/, /mag-/	/-in/ (UV_1), /i–/ (UV_2), /-an/ (UV_3)

A (verb-) stem v combines with a VA to build a complex predicate. This combination is subject to certain restrictions, i.e., not each VA is admissible for each stem. Furthermore, both the argument structure (AS) of a stem and its interpretation possibly depends on the VA with which it combines. These phenomena must be explained by any theory of the VAs in Tagalog.

2 The Data

2.1 Transfer-Verbs

According to Foley 1976, the VA /i-/ indicates a nominal which is an intermediary in the transfer of the main action of the clause between the two other nominals. This characterization applies to stems like /bigay/ ('give'), /turo/ ('teach') and /tanim/ ('plant'), elements of which will be said to belong to the 'bigay'-type in the sequel.

101

a. I-b-in-igay ng babae ang liham sa kapit-bahay
   UV$_2$-b$_{stem}$-REALIS-give NOM woman GEN letter DAT neighbour
   The woman gave the letter to the neighbour

b. I-t-in-uro ng titser ang Pilosopya sa akin
   UV$_2$-t$_{stem}$-REALIS-teach GEN teacher NOM philosophy I.DAT
   The teacher taught me philosophy

c. I-tanim mo sa hardin ang mga bulaklak!
   UV$_2$-plant you.GEN DAT garden NOM PL flower
   Plant the flowers in the garden!

a. B-in-igy-an ng babae ng liham ang kapit-bahay
   B$_{stem}$-REALIS-give-UV$_3$ GEN woman GEN letter NOM neighbour
   The woman gave the neighbour a letter

b. T-in-uru-an ako ng titser ng Pilosopya
   T$_{stem}$-REALIS-teach-UV$_3$ I.NOM GEN teacher GEN philosophy
   The teacher taught me philosophy

c. Tanim-an mo ng mga bulaklak ang hardin!
   Plant-UV$_3$ you.GEN GEN PL flower NOM garden
   Plant the flowers in the garden!

For this type of stem only the UV affixes /i-/ and /-an/ are admissible. The UV /-in/ is excluded. There is no meaning variance (i.e., in the English translation the same verb is used) and the AS is the same for both UV affixes that are admissible.

Foley's characterization of /i-/ does not distinguish different *sorts* of transfer. In particular, it does not account for Pittman's (1966) observation that in Tagalog *centripetal* and *centrifugal* actions can be distinguished. Pittman applied this distinction to the interpretation of the AV affixes /um-/ and /mag-/.[1] But it can equally be used for an at least partial characterization of the UV affixes /i-/ and /-in/.

- the admissibility of /i-/ is related to *centripetal* action: /i-/ identifies the argument denoting the object *moving away* from the Actor as the subject of the clause

- the admissibility of /-in/ is related to *centrifugal* action: /-in/ identifies the object that is moved *towards* the Actor as the subject

An example for a stem that expresses a centrifugal action is /kuha/ ('take'). In contrast to elements of the 'bigay'-type, which express a centripetal action, /-in/ and /-an/ are admissible whereas /i-/ is excluded. The 'kuha'-type is similar to the 'bigay'-type in showing neither meaning variance nor changes of AS, depending on the VA with which a stem combines.

(3) a. Kun-in mo sa kaniya ang lapis
       Take-UV$_1$ you.GEN he.DAT NOM pencil
       Get the pencil from him!

    b. Kun-an mo siya ng lapis
       Take-UV$_3$ you.GEN he.NOM GEN pencil
       Get a pencil from him!

---

[1] See Latrouite (1999) for extensive discussion.

This difference with respect to the admissibility is not accounted for by Foley's characterization, according to which the 'bigay'- and the 'kuha'-type should both admit /i-/ because there always is an intermediary (a transferred object).

2.2 Two Sorts of Transfer

In this section the two sorts of transfer, centripetal and centrifugal, will informally be defined. In the sequel the following convention is used: x = Actor; y = transferred object; z = destination/source of transfer (where it is required that $z \neq x$, i.e. z is not identical to the Actor). Let $\mathbf{Q}$ be the property such that $s \in \mathbf{Q}(a)(b)$ just in case a has b at s, where 'has' is to be understood in a broad sense that not only covers possession but also knowledge (a knows b) and location (a is in/at b).

For a centripetal transfer one gets the following three possibilities that are admissible ($\alpha(e)$ is the beginning and $\omega(e)$ the end of an event that brings about the transfer).

	$\alpha(e)$	$\omega(e)$	
(i)	$\in \mathbf{Q}(x)(y)$	$\notin \mathbf{Q}(x)(y)$	/bigay/ (physical movement)
(ii)	$\in \mathbf{Q}(x)(y)$	$\in \mathbf{Q}(x)(y)$	/turo/
(iii)	$\notin \mathbf{Q}(x)(y)$	$\notin \mathbf{Q}(x)(y)$	/tanim/

Cases (ii) and (iii) do not involve any change between x and y because the condition is an invariant. E.g., if x teaches z Philosophy, then x knows Philosophy at the beginning of the event (otherwise x could not teach it). But x does not loose this knowledge in the sense that at the end of the event z knows Philosophy whereas x has lost his knowledge on that particular topic. Examples of case (iii) are events of type 'tanim' where the Actor does not have the flowers that he is going to plant in the garden at the beginning of the event but begins by taking them. Another way of executing events of this type are subsumed by case (i). The Actor already has the object to be planted at the beginning.

A centrifugal transfer is characterized by the remaining fourth possibility.

$$\alpha(e) \notin \mathbf{Q}(x)(y) \quad \omega(e) \in \mathbf{Q}(x)(y) \quad \text{'kuha'-type}$$

2.3 Further types of Stems admitting /i-/

Even if one distinguishes between two sorts of transfer, this does not capture all generalizations concerning /i-/. Consider the following data.[2]

(i) there are stems that admit all three UV-affixes

/akyat/ (go up), /hagis/ (throw), /halo/ (mix)

---

[2]Many of these data are taken from Himmelmann 1987.

(4) a. Akyat-in   mo   ang kanya-ng kuwarto
       Go-up-UV$_1$ you.GEN   NOM he-LINKER room
       Go up (upstairs) to his room

    b. Akyat-an   mo   ang kaniya-ng kuwarto   ng mga libro
       Go-up-UV$_3$ you.GEN   NOM he-LINKER room   GEN PL book
       Bring the books up (upstairs) to his room!

    c. I-akyat   mo   ang mga libro
       UV$_2$-bring up you.GEN   NOM PL book
       Bring the books up(stairs)

For /akyat/ one gets both meaning variance and change of argument structure: /-in/: transitive; /i-/, /-an/ ditransitive.

(5) a. Hagis-in   mo   siya   ng sapatos
       Throw-UV$_1$ you.GEN   he.NOM   GEN shoe
       Throw the shoe at him!

    b. Hagis-an   mo   ako   ng sapatos
       Throw-UV$_3$ you.GEN   I.NOM   GEN shoe
       Throw a show to me/in front of me!

    c. I-hagis   mo   sa akin   ang sapatos
       UV$_2$-throw   you.GEN   I.DAT   NOM shoe
       Throw a show at me!

In contrast to /akyat/, /hagis/ shows neither meaning variance nor change of AS.

(iia) there are stems that, like /bigay/, admit only /i-/ and /-an/ but with MV and change of AS

(6) a. Hiwalay-an   mo   ang iba-ng pasyente
       Leave-UV$_3$ you.GEN   NOM other-LINKER patient
       Leave (you) the other patients

    b. I-hiwalay   mo   siya   sa iba-ng pasyente
       UV$_2$-separate you.GEN   he.NOM   DAT other-LINKER patient
       Separate (isolate) him from the other patients!

(iib) there are stems that, like /bigay/, admit only /i-/ and /-an/ and for which there is neither meaning variance nor a change of AS but which do not express a transfer. An example is /bukas/ ('open')

(7) a. I-bukas   mo   ang pinto
       UV$_2$-open   you.GEN   NOM door
       Open the door!

    b. Buks-an   mo   ang pinto
       UV$_3$-open   you.GEN   NOM door
       Open the door!

(iii) there are stems that admit only /i-/ but neither /-in/ nor /-an/: /bagsak/ ('drop/slam down'), /ikot/ ('turn'), /tungo/ ('bend') and /takbo/ ('run', 'take s.th. on the run')

(8) a. B-um-agsak   ang baso
       B_{stem}-AV/REALIS-drop   NOM vase
       The vase fell/dropped

     b. I-b-in-agsak   ng bata   ang baso
       UV_2-b_{stem}-REALIS-drop   GEN child   NOM vase
       The child slammed down the vase

(9) a. T-um-akbo   ako
       T_{stem}-AV-run   I.NOM
       I run

     b. I-takbo   mo   ang gamot
       UV_2-run   you.GEN   NOM medicine
       Run (away) with the medicine

These stems show both meaning variance and change of AS between AV- and UV-affix: with /um-/ they are intransitive, whereas with /i-/ they are transitive. Similarly to the 'bukas'-type, no third argument is realized such that there is no object that is transferred to a destination different from the Actor.

(iv) there are stems for which /-in/ and /i-/ are admissible but not /-an/ and which show neither meaning variance nor change of AS. Examples are /saksak/ ('stab') and Point-verbs like /puknok/ ('hit') and /hampas/ ('hit', 'beat')

(10) a. Saksak-in   mo   siya
       Stab-UV_1 you.GEN   he.NOM
       Stab him!

     b. I-s-in-aksak   ko   sa kaniya   ang lanseta
       UV_2-s_{stem}-REALIS-stab   I.GEN   he.DAT   NOM folding knife
       I stabbed him with a folding knife

(v) there are verbs that allow all three UG affixes, yet for which /i-/ is admissible only if the subject denotes the instrument with which the action is executed.

(11) I-kain   mo   ng isda   ang iyong kutsara
      UV_2-eat   you.GEN   GEN fish   NOM-this-spoon
      Eat the fish with the spoon

The stems belonging to either (i), (iia) and (iv) can be interpreted as expressing a centripetal transfer if they combine with /i-/. This is shown in (12) by relating the stems to the three cases characterizing a centripetal transfer and in (13) for the specific examples given above.

(12)   a. /hagis/: the Actor has the transferred object at the beginning of the event but not at its end. This corresponds to the first case of a centripetal transfer

b. /akyat/, /saksak/: they are covered by case (ii) of a centripetal transfer. The Actor has the transferred object continuously from the beginning until the end of the event

c. /halo/, /hiwalay/: these two stems belong to the third case of a centripetal transfer. The Actor has the transferred object y neither at the beginning nor at the end of the event (i.e., (s)he does not give away y to some destination).

(13) a. /hagis/: the object thrown is transferred from the Actor to the place (or person) to (at) which it is thrown (or the destination is left implicit)

b. /akyat/: the books are transferred to the destination (i.e. the room)

c. /saksak/: the object stabbed, e.g. a knife, is transferred from a place outside the body of person z into z's body such that z functions as the destination

d. /halo/: the stuff is transferred from some source location to the stuff it is mixed in as destination

e. /hiwalay/: the patient who is separated from the others is transferred from the latter to some destination that is left implicit

This interpretation is possible because the stem is always used ditransitively. From this it does not follow that whenever a stem is used ditransitively if it combines with /i-/ it expresses a centripetal transfer. Counterexamples to this generalization are stems like /kain/, listed in (v), where the third argument is the instrument that is used to carry out the action.

The stems discussed in (12) and (13) become problematic if one considers the admissibility with other UV-affixes and the possible changes both at the level of meaning and at the level of argument structure. E.g., if it combines with /-in/, the stem /akyat/ no longer expresses a transfer because it is used transitively and not ditransitively. This shows that admissibility with respect to this voice affix cannot be defined in terms of a centripetal action. They therefore constitute the same type of counterevidence as the stems in (iib) and (iii). The importance of these counterexamples can be taken to consist in showing that whenever a stem v expresses a transfer only for certain stems that are admissible for it but not for all, the (dynamic) meaning of v cannot be reduced to some sort of transfer but must be taken as something more general that subsumes a transfer as a special case. Such a generalization seems exactly what is needed in order to solve the problem that pose stems admitting /i-/ that do not express a transfer because they are used transitively.

The conclusion that must be drawn from the above discussion is that the notion of a centripetal transfer does not capture all uses of /i-/, if the notion of transfer is understood as involving three objects: a source, a destination and a transferred object. Counterexamples to this conception are stems discussed in (iib), (iii) and (v). In (14) the behaviour of /i-/ is summarized.

(14) The UV-affix /i-/ is admissible for a stem v if one of the following conditions is satisfied.

(i) an object y is transferred to some destination (location) that is not the Actor ('bigay'-type, centripetal transfer); in this case the stem v is used ditransitively; the subject determined by /i-/ is the transferred object

    (ii) the stem does not express a transfer

       two subcases must be distinguished

          a. the action inherently involves an instrument (/kain/); the stem v is again used ditransitively; the subject determined is the instrument

          b. stems covered by (iib) and (iii); only in this case the stem v is used transitively; the subject is the non-Actor argument

What is needed is a generalization of the notion of a centripetal Transfer that also captures cases (14iia) and (14iib).

3 Dynamic Event Semantics (DES)

3.1 Changes as Objects and Changes as Transformations of States

Dynamic Event Semantics (DES), Naumann 1998, to appear, is based on the intuition that non-stative verbs express changes. The intuitive notion of a change can be made precise in two different ways. It is either (i) an object (action, event), or (ii) a transformation of state, i.e., a state s at which a result Q does not hold is transformed into a state s' at which Q holds. Two aspects of a transformation of state can be distinguished: (a) a result Q that is brought about and (b) the way the result Q is brought about. This idea is made precise in DES by having both an *eventuality-structure* **E** and a *transition-structure* **S**.

A basic eventuality-structure **E** is a tuple $< E, \sqsubseteq_E, \{P_v \mid v \in VERB\} >$ such that

- E is the domain of events

- $\sqsubseteq_E$ is the material part of relation on E

- each P_v is a subset of e; P_v is the set of all events of type P_v; e.g., for $v = eat$, P_v is the set of all eating events

A basic transition-structure **S** is a tuple $< S, <_S >$ such that

- S is the domain of states (or time points)

- $<_S$ is the precedence (earlier) relation on S

The two structures are related by two total functions $\alpha : E \to S$ and $\omega : E \to S$ that assign to each event $e \in E$ its beginning- and end point, respectively. Together, α and ω determine e's execution sequence $\tau(e) = \{s \in S \mid \alpha(e) \leq_S s \leq_S \omega(e)\}$. This sequence can be split into three parts corresponding to a nucleus-structure (Moens/Steedman (1988)). There is the inception-point (IP), the development-portion (DP) and the culmination-point (CP) $(\alpha(e) = s, \omega(e) = s')$.

$$
\begin{array}{ccc}
s & & s' \\
| -------- | & & \text{Nucleus-Structure} \\
IP \quad DP \quad CP & &
\end{array}
$$
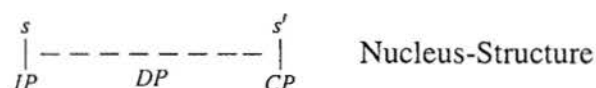
IP (inception-point) = $[s]$, *DP* (development-portion) = $]s, s'[$, *CP* (culmination-point) = $[s']$

3.2 Types of Results

Each event-type P_v determines for each of its elements e a set $Res(P_v, e)$ of results that e can possibly bring about. Two principle types of results are distinguished: minimal and maximal ones. They are informally defined in (15) (For a formal definition, see Naumann/Latrouite 1999 and Latrouite/Naumann 1999b).

(15)   a. *minimal* results possibly hold at intermediate states of the execution sequence of an event

        b. *maximal* results only hold at the end point of an event (if they hold there at all)

The two types of results are illustrated by an event of type 'John eat a fish'. Minimal results are: (i) partial decrease of the mass of the fish and (ii) part of the mass of the fish is in John's stomach. Results which are maximal are: (i) the mass of the fish is zero (complete decrease of its mass) and (ii) the (complete) mass of the fish is in John's stomach. Minimal and maximal results together are the v-closed results. Intuitively, a result is v-closed if bringing it about on an initial stage e' of an event e that belongs to P_v is sufficient for e' to belong to P_v too.

The types of results are temporally ordered by $\leq_v$: if $Q \leq_v Q'$, this means that whenever Q' is brought about on the execution sequence of an event $e \in P_v$, then Q has already been brought about, i.e., Q is brought about not later than Q'. Results that are distinct but which are brought about simultaneously, can be distinguished by implicational relations; this yields the more fine grained ordering $\leq_v^*$: $Q \leq_v^* Q'$ just in case $Q <_v Q'$ or $[Q =_v Q' \wedge Q' \subseteq Q]$.

3.3 Sorts of Event-Types

Minimal and maximal results do not exclude each other. The exact relationship depends on the *sort* of event-type to which P_v belongs. Two basic sorts are distinguished:

(16)   a. P-atomic event-types

$$\forall P[P - ATOMIC(P) \longleftrightarrow \forall e[e \in P \to \neg \exists e'[prefix(e', e) \wedge e' \in P]]]$$

an event-type P is P-atomic just in case for each of its elements e no proper initial stage (prefix) e' belongs to P

        b. non-atomic event-types

$$\forall P[NON - ATOMIC(P) \longleftrightarrow \neg P - ATOMIC(P) \wedge \forall e[e \in P \to \alpha(e) <_S \omega(e)]]$$

an event-type P is non-atomic just in case none of its elements is point-like and there is at least one element which has a proper initial stage e' that is of type P too

Examples for P-atomic event-types are those corresponding to the stems /kuha/ and /bigay/. Non-atomic event-types are those corresponding to stems of sort Accomplishment like /kain/, /kanta/ ('sing') and /bukas/.

For P-atomic event-types, the distinction between minimal and maximal results collapses. Each minimal result is maximal and vice versa. For non-atomic event-types minimal results are never maximal. These possibilities lead to the following definitions of further types of results in terms of the two basic ones.

(17) a. A result Q is *w-maximal* just in case it is both minimal and maximal

   b. A result Q is *s-maximal* just in case it is maximal but not minimal

   c. A result Q is *w-minimal* just in case it is minimal but not maximal

From what has been said it follows that P-atomic event-types determine only w-maximal results, whereas Non-atomic event-types (corresponding to non-stative stems) determine either only w-minimal results or w-minimal and s-maximal results. In Table 1 the types of results for three classes together with the ordering in terms of $\leq_v^*$ are depicted.

Table 1	types of results determined
ACCO	w-min $\leq_v^*$ ($\leq_v$) s-max
ACT	w-min
/kuha/, /bigay/	w-max (2); w-max$_1$ $\leq_v^*$ w-max$_2$

Table 2 illustrates the assignment of results to different arguments whereas Table 3 gives examples of different types of results for various stems together with the assignment to arguments (Results that are minimal$_{non-v}$ are brought about before w-minimal results and are not v-closed, i.e., bringing about only results of this type is not sufficient for an event to be of type v).

Table 2		x	y	
ACCO	/kain/	w-min; s-max$_2$	w-min s-max$_1$; s-max$_2$	-
Transfer		x	y	z
sort	/kuha/	w-max$_2$	w-max$_1$ w-max$_2$	w-max$_1$
sort	/bigay/	w-max$_1$	w-max$_1$ w-max$_2$	w-max$_2$

Table 3	min$_{non-v}$	w-min.	w-max. or s-max.
eat an y	initial	partial decrease of y	mass of $y = 0$ (s-max$_1$) mass of y is in x's stomach (s-max$_2$)
push y	actions	y traverses a path	—
x takes y from z	performed	—	x has y (w-max$_2$) z does not have y (w-max$_1$)
x gives y z (involving physical action)	by the Actor	—	z has y (w-max$_2$) x does not have y (w-max$_1$)

4 Generalizing the Notion of Transfer

From the perspective of DES a transfer, either a centripetal or a centrifugal one, is an event e that brings about a number of results that are determined by the event-type P_v to which e belongs. E.g., for an event e of type 'bigay' the two principle (v-closed) results are that the Actor x ceases to have the Transferred Object y whereas the Destination z starts to have y at the end of the event (see Table 3). Both results are of type w-maximal and are therefore maximal. As these results are required to hold at the end point $\omega(e)$ of e, it follows that they only hold at that point of e's execution sequence $\tau(e)$ and at no other point. This means that these results are brought about last. They are therefore maximal elements of $Res(P_v, e)$ relative to the ordering $\leq_v$. Results which satisfy this condition will be called *strongest* results. The exact definition is given in (18) (Q a set of results).[3]

(18) $\forall Q \forall Q(\text{Strongest}_v(Q, Q) \Leftrightarrow Q \in Q \wedge \forall Q'(Q' \in Q \to Q' \leq_v Q))$

Maximal results are always strongest results. The inverse need not be true. E.g., an Activity-verb like 'push' in English or the stem /asin/ ('salt') in Tagalog determine only (w-) minimal but no maximal results. Consequently, the strongest results of $Res(P_v, e)$ for $v =$ push are (w-) minimal and not maximal.

Strongest results are maximal with respect to $\leq_v$. Similarly, *greatest* results are maximal elements of $Res(P_v, e)$ relative to the more fine-grained ordering $\leq_v^*$.

(19) a result Q is the *greatest* element of $Res(P_v, e)$ with respect to $\leq_v^*$ just in case it is a maximal element of $Res(P_v, e)$ with respect to $\leq_v^*$

$$\forall Q \forall Q(\text{Greatest}_v(Q, Q) \Leftrightarrow Q \in Q \wedge \forall Q'(Q' \in Q \to Q' \leq_v^* Q))$$

Greatest elements are in general unique. An exception is the stem /akyat/, which can define two greatest results. Furthermore, greatest elements are always strongest results. The inverse need not be true. This has to do with $=_v$ -equivalence: different results that are brought about simultaneously can all he strongest results but they can (possibly) be distinguished by $\leq_v^*$. An example is given by w-maximal results. One has: w-max$_1$ $\leq_v^*$ w-max$_2$ and w-max$_1$ $=_v$ w-max$_2$. Both w-maximal results are strongest results but only the w-max$_2$ result is a greatest element of $Res(P_v, e)$. In Table 4 the distinction between strongest and greatest results is illustrated by means of some examples.

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[3]Note that according to (18) the definition of a strongest result is relativized to an event-type P_v because there is not a single relation *Strongest* but for each $v \in VERB$ there is a corresponding relation *Strongest$_v$*.

Table 4	strongest results	greatest results
/bigay/	z has y not (x has y)	z has y
/kuha/	x has y not (z has y)	x has y
/kain/	mass of $y = 0$ mass of y is in stomach of x	mass of y is in stomach of x
/hagis/	y is at z	y is at z
/akyat/	x/y is at z	x/y is at z
/saksak/	y is in z	y is in z

From Table 4 it follows that the characterizing result of a centripetal transfer, the Destination z has the Transferred Object y, is expressed in DES as a particular type of result, namely as the greatest element of $Res(P_v, e)$. Furthermore, the Transferred Object y is, in addition, assigned all v-closed results. E.g., in the case of an event e of type 'bigay' y is assigned both the w-maximal$_1$ result ('x does not have y') and the w-maximal$_2$ result ('z has y'). When taken together, one gets (20).

(20)   a. The Destination z and the Transferred Object y are both assigned a greatest result from $Res(P_v, e)$

   b. the Transferred Object y is assigned all v-closed results

The condition characterizing y in (20) does not rely on the fact that the greatest element(s) of $Res(P_v, e)$ is (are) also assigned to some other object z. Thus, (20) is an instance of the more general scheme in (21).

(21)   a. The object y is assigned a greatest result from $Res(P_v, e)$

   b. The object y is assigned all v-closed results

(21) differs from (20) in not requiring that the greatest result(s) from $Res(P_v, e)$ be assigned to any other object besides y. According to (21), a transfer (-event) e is characterized by the fact that there is an object participating in e that is assigned all v-closed results and (therefore) a greatest element from $Res(P_v, e)$. This characterization not only applies to transfers, i.e., events involving a Source, a Destination and a Transferred Object, but also to the events denoted by the stems in (iib) and (iii) for which only two participants undergo a change. In Table 5 the v-closed results for the corresponding stems are given and in (22) the results are paraphrased in terms of a transformation of state.

Table 5	v-closed results
/bukas/	y is open
/bagsak/	y is falling (down) $\rightarrow$ y traverses a non-empty path
/tungo/	y is in a bending state $\rightarrow$ y traverses a non-empty path
/ikot/	y is turning (rotating) $\rightarrow$ y traverses a non-empty path

111

(22) a. /bukas/: the object y that is opened, e.g. a door, is transferred from its initial position, it is closed, to its final position, it is open, i.e., its angle to the wall is no longer zero degree

  b. /bagsak/: the object y slammed down, e.g. a vase, is transferred from its initial position (say, standing at some place z') to its final position (say on the ground)

  c. /tungo/: the object y is brought from a state in which it is straight into a bending state

  d. /ikot/: the object y is brought from a state in which it is at rest into a state in which it is no longer at rest but in which, e.g., it is turning

The intuition behind the generalization in (21) is the following. If there is a destination z to which y is transferred during the event e, this is expressed as a result: z has (or possesses) y, which is the greatest result of $Res(P_v, e)$. If there is no destination, this is equally expressed in terms of a result: y is in state ϕ at the end of e. Thus, y can be said to be 'transferred' into a state ϕ in which it has not been at the beginning of the event, i.e., y is transferred in a non-literal sense.

The problem that the generalization in (21) faces is that it is too broad. E.g., it equally applies to stems of the 'kuha'-type. What is needed is a generalization of (20) that is more restricted than the generalization given in (21). (21) can be restricted in at least two ways. On the one hand, it is possible to impose restrictions on the *type* of result assigned to either y or all participants of e. On the other hand, there are restrictions on which objects, besides y, are assigned the greatest element(s). These options will be considered in the next section.

5 Admissibility Condition for /i-/

In the preceding section it was shown that if an object y is transferred to the destination z, then a greatest result is assigned to both y and z: $Q(z)(y)$ for $s \in Q(a)(b)$ just in case a has b at state (point) s. This assignment to y is independent of the sort of transfer, i.e. of whether the transfer is centripetal or centrifugal. Consequently, in a proper transfer the Transferred Object y is always assigned a greatest element from $Res(P_v, e)$: $Q(a)(y)$ for some a participating in e. For a centrifugal transfer, $a = x$ holds, i.e., a is the Actor, whereas for a centripetal transfer a is not identical to the Actor such that $a \neq x$ holds. Thus, the requirement in (23) is sufficient to exclude stems of the 'kuha'-type.

(23) The Actor x is *not* assigned a greatest element from $Res(P_v, e)$

If (23) holds, i.e., if $a \neq x$, the two sorts of transfer characterized by $\omega(e) \notin Q(x)(y)$ are captured. Now, $\omega(e) \notin Q(x)(y)$ is an instance of the following general scheme.

(24) for all d s.t. $Q(..., d, ...)$ with $Q \in Res(P_v, e)$ and Q a greatest element: $d \neq x$

(24) requires that the Actor x be assigned no greatest result. This requirement applies not only to Transfer-verbs but to any verb because it imposes only a condition on the Actor x. Consequently, also cases in which there is no transfer and in which x is not assigned a greatest element are captured. This applies to stems like /bukas/, /ikot/ or /tungo/.

(23) restricts (21) because it simply adds a further condition that must be satisfied, besides those imposed by (21). It differs from (20) because no condition is imposed on a possible Destination z but rather on the Actor x. As each event has an Actor x but not necessarily a Destination z, (23) is a generalization of (20).

(23) cannot be the final version of the admissibility condition for /i-/ because it is too restrictive. It excludes tems that admit this VA. Examples are the stems /akyat/, /kain/ and /takbo/. In each case the interpretation of the stem assigns for a given event $e \in P_v$ a greatest element to the Actor x. They are therefore similar to stems like /kuha/ although they differ with respect to the admissibility of /i-/.

Stems belonging to the 'kuha'-type can be distinguished from stems like /akyat/ as follows. There is a result Q', namely the w-max$_1$ result, that is assigned to y *but not x*: z does not have y. As each w-maximal result is v-closed, it follows that there is a v-closed result that is assigned to y but not to x. The Actor x is the object that is assigned the greatest result besides the transferred object y which is assigned all v-closed results. Now consider the requirement in (25).

(25) If the greatest result(s) Q is (are) assigned to some object x' besides the object y that is assigned all v-closed results, each v-closed result Q' that is assigned to y (and some other participant x'') is also assigned to x'

This condition is *not* satisfied for the 'kuha'-type, as shown above: y is assigned the w-max$_1$-result but it is *not* assigned to x, although x is assigned the greatest element besides y. This condition *is* satisfied for the three stems that admit /i-/, although the Actor x is assigned the greatest element. In Table 6 the greatest element(s) together with the other v-closed results that are assigned to y and some other participant x' are shown.

Table 6	greatest element	non-greatest elements
/kain/	the mass of y is in the stomach of x	part of the mass of y is in the stomach of x
/akyat/	x/y are at z	x/y move up towards z
/takbo/	x and y move together (only v-closed result)	x and y move together

The first two stems semantically determine w-minimal and s-maximal results. The s-maximal result that is the greatest element is assigned not only to y but also to the Actor x (and the Goal z in the case of /akyat/). The same assignment of objects also holds for the w-minimal result that is assigned to more than one object so that condition (25) is satisfied. For /takbo/ the greatest element is of type w-minimal, i.e., no maximal results are determined. This result is assigned to both x and y, i.e., condition (25) is again satisfied.

The intuition behind (25) is that if the Actor x is assigned a greatest element, it is required that (s)he be involved with the object y that is assigned this result too for all initial stages e' of e that are of type v. The condition in (25) not only applies to Transfer-verbs but to all verbs because y is not required to be transferred in some sense but is singled out by the requirement that it be assigned all v-closed results.

When taken together, one arrives at the admissibility condition for /i-/ in (26).

(26) The UV_2 affix /i-/ is admissible for a stem v just in case either

    a. the Actor x is not assigned a greatest element from $Res(P_v, e)$ for $e \in P_v$, or

    b. the Actor x is assigned a greatest element Q from $Res(P_v, e)$ for $e \in P_v$ and for each $y \neq x$ that is assigned Q too all v-closed results assigned to y (and at least one other object x') are assigned to x too

6 Admissibility Condition for /-in/

If only stems belonging to the 'kuha'-type are considered, the admissibility condition in (27) could be used for the UV_1 affix /-in/.

(27) admissibility condition for /-in/ (1. version)

the VA /-in/ is admissible for a stem v just in case

    a. P_v determines for each of its elements a maximal result

$$\forall e(e \in P_v \rightarrow \exists Q(Q \in Res(P_v, e) \wedge \max_v(Q)))$$

    b. the Actor x of an event $e \in P_v$ is always assigned a greatest element of $Res(P_v, e)$

$$\forall e(e \in P_v \rightarrow \exists Q \exists d(Q \in Res(P_v, e) \wedge Greatest_v(Q, Res(P_v, e)) \wedge \Delta_v(e)(d)(Q) \wedge Actor(e) = d))$$

If P_v determines for each of its elements a maximal result, it follows that the greatest elements are maximal results. (27b) can therefore be strengthened to: 'the Actor x is always assigned a maximal result that is a greatest element of $Res(P_v, e)$'.

The problem that the admissibility condition in (27) faces was already alluded to above. There are stems v that admit /-in/ but for which the Actor is not assigned a maximal result that is a greatest element of $Res(P_v, e)$. Three classes can be distinguished:

(28)   a. stems like /kanta/ ('sing'), /basa/ ('read'), /halo/ ('mix') and /saksak/ ('stab')

       b. Point-verbs like /hampas/ ('hit') and /puknok/ ('hit', 'beat')

       c. stems like /hagis/ ('throw')

Stems v belonging to the first class are characterized by the property that an event $e \in P_v$ is *materially incremental* with respect to at least one object that is assigned a greatest element from $Res(P_v, e)$. This property is formally defined in (29).

(29) an event $e \in P_v$ is *incremental* with respect to an object d participating in it just in case the following conditions hold ($(e, e') \in R_B$ just in case e is a proper initial stage (prefix) of e'; $\sqsubset_O$ is the (proper) material part relation on the domain O of objects; $\Delta_v^*(e)(d)$ is true just in case d participates in e)

    a. $\forall e, e', d[e \in P_v \wedge R_B(e', e) \wedge \Delta_v^*(e)(d) \rightarrow \exists d'[d' \sqsubset_O d \wedge \Delta_v^*(e')(d')]]$ and

b. $\forall d, d', e[e \in P_v \wedge \Delta_v^*(e)(d) \wedge d' \sqsubset_O d \rightarrow \exists e'[R_B(e', e) \wedge \Delta_v^*(e')(d')]]$

The second class is characterized by the property in (30).

(30) The Destination z does not have (possess) the Transferred Object y at the end of the event; rather, y only touches z and produces a sound

Furthermore, the result does not continue to hold after the end of the event. In DES two sorts of results are distinguished: *event-related* and *state-related* results. A result Q is event-related just in case it does not continue to hold after the end of an event that brought it about. A result Q is state-related just in case it continues to hold after the end of an event that brought it about until another event undoes it (if there is such an event at all), (31).

(31) $\forall Q \forall e[e \in P_v \wedge Q \in Res(P_v, e) \wedge Greatest_v(Q, Res(P_v, e)) \rightarrow Event - Related(Q)]$

The characterizing property of verbs belonging to the third class, /hagis/, is given in (32).

(32) The Actor is never active until the end of an event of this type

(32) implies that for all results Q that are determined by P_{hagis} for an event e belonging to this set and that are required to hold at the end point $\omega(e)$ of e one has that Q is not assigned to the Actor, (33).

(33) $\forall Q \forall e(Q \in Res(P_v, e) \wedge \omega(e) \in Q \rightarrow \forall d(\Delta_v(e)(d)(Q) \rightarrow \neg Actor(e, d)))$

The characterizing properties of the three classes must be accounted for in the admissibility condition of /-in/. Formally, this means that the second clause of the admissibility condition in (27) must be disjunctive. This yields (34) (the admissibility condition improves on that given in Latrouite/naumann 1999a/b).

(34) admissibility condition for /-in/ (final version)

the VA /-in/ is admissible for a stem v just in case

    a. P_v determines for each of its elements a maximal result, and

        either

      bi. the Actor is always assigned a maximal result that is the greatest element with respect to $Res(P_v, e)$

        or

      bii. the Actor is never assigned a maximal result, and either (i) at least one object that is assigned a greatest element from $Res(P_v, e)$ is incremental (an Incremental Theme) or (ii) the Actor is never active until the end of the event

The first clause excludes activity-verbs like /asin/ ('salt') as well as stems like /takbo/ ('run', 'x takes y on the run'). Clauses bi and bii exclude stems like /bigay/, /bukas/, /ikot/, and /tungo/ because the Actor is never assigned the greatest element from $Res(P_v, e)$ and the participants that are assigned the greatest elements do not satisfy any of the conditions mentioned in bii; a stem like /hiwalay/ is excluded because the Actor x is not *always* assigned the greatest element (for ditransitive uses; for transitive uses, with meaning 'leave', x is assigned the greatest element) and the clauses of bii do not apply to it; a stem like /bagsak/ is excluded because it does not satisfy clause bi and neither of the conditions mentioned in bii; in particular, the third condition is excluded because for intransitive uses the Actor is involved until the end of the event.

7   The Determination of the Subject

7.1   The Subject determined by /i-/

Consider the set $S_{v,e}$ of participants of an event $e \in P_v$ that is determined by the following conditions.

(35)   An object d is an element of the set $S_{v,e}$ just in case

  a. d is assigned a greatest result from $Res(P_v, e)$

  b. d is temporally minimal with respect to condition (a)

  c. d is not globally minimal

(36)   a. An object d participating in an event $e \in P_v$ is *temporally minimal* with respect to a condition Q relative to the participants of e just in case d satisfies Q and for each d' participating in e that satisfies Q too (i) d and d' are assigned the same results or (ii) the least result Q relative to the ordering $\leq_v^*$ that is assigned to d $\leq_v^*$-precedes the least result relative to the ordering $\leq_v^*$ assigned to d' or (iii) d and d' agree on the least result relative to $\leq_v^*$ that is assigned to them and there is a least result Q that is assigned to d' but not to d

  b. An object d participating in an event $e \in P_v$ is *globally minimal* just in case (i) it is assigned the least result from $Res(P_v, e)$ relative to the ordering $\leq_v$ and (ii) if there is an object d' participating in e that satisfies this condition too, then there is an antecedent event e' of e such that d is temporally minimal relative to d' with respect to condition (i) relative to e'

The first clause requires that d be assigned a greatest result from $Res(P_v, e)$. This condition need not single out a unique object participating in e, witness many of the examples that have been discussed so far. If, on the other hand, a unique participant is singled out, it is determined as the subject by /i-/. This is the case for stems like /bukas/, /baksak/, /ikot/ and /tungo/. In each case the object that satisfies clause (a) also satisfies clauses (b) and (c). Clause (b) is vacuously satisfied because only one object satisfies clause (a). Clause (c) is satisfied because the object that is assigned the greatest element is not the Actor, who is always globally minimal. Thus, if only those stems admitting /i-/ are considered for which the

greatest elements(s) is (are) assigned to a unique object, the set $S_{v,e}$ can be taken to uniquely determine the subject that is determined by /i-/.

If the greatest element(s) is (are) not assigned to a unique object, two cases can be distinguished: either the Actor x is one of those objects or the Actor x is not among the objects that are assigned a greatest element. If the second possibility holds, i.e., if the Actor x is not assigned a greatest result, the stem expresses a centripetal transfer. This means that the greatest result is assigned both to the Transferred Object y and the Destination/Source z. This is the case for stems belonging to the 'bigay'-type, /hagis/, /halo/, /hiwalay/, /saksak/ and Point-verbs like /hampas/. The Destination/Source z is characterized by being assigned *only* the greatest element whereas the Transferred Object y is assigned further results which precede the greatest element. That means that the Transferred Object y is *temporally minimal* relative to z with respect to the condition of being assigned a greatest result. This condition is expressed in clause (ii), which, therefore, excludes the Destination/Source z. As the Transferred Object is in addition not the Actor, who is excluded by clause (iii), it follows that for this case too the set singles out a unique object that is determined as the subject by /i-/.

The last case to be considered is given by the condition that the greatest element of $Res(P_v, e)$ is assigned to more than one object, one of which is the Actor. This is satisfied for the stems /akyat/, /takbo/ and /kain/. For /akyat/ the Destination z is also assigned a w-minimal result ('x/y traversed a non-empty path towards z'). Yet, there is a further w-minimal result, 'x/y traversed a non-empty path', that is *not* assigned to z. As a consequence z, does not satisfy the minimality condition expressed in clause (ii). Contrary to the other cases, no single object is singled out so far because both the Actor x and the Transferred Object y satisfy the first two clauses. The Actor x is excluded by clause (iii) because the Actor is always globally minimal. Thus, for /akyat/ too $S_{akyat,e}$ determines a unique element that is denoted by the nominative argument if this stem combines with /i-/. The stem /takbo/ is similar to /akyat/ relative to the first two clauses. No unique participant d of e is singled out. The first two clauses determine the Actor x as well as the object y that is taken with by x. Similarly to the stem /akyat/ the third clause excludes x such that only y is an element of $S_{takbo,e}$, which is determined as subject by /i-/. For /kain/ the first condition yields both the Actor and the object eaten (the Incremental Theme). The minimality condition in (ii) excludes the latter (i.e. the Incremental Theme) so that only the Actor x is determined by the first two clauses. The latter is then excluded by clause (iii). As a consequence, for /kain/ $S_{kain,e}$ is the empty set, i.e., no object is singled out. Yet, for /kain/ neither the Actor nor the Incremental Theme is determined as subject by /i-/. This is exactly what is required.

From the above discussion it follows that for each stem admitting /i-/ that does *not* determine the instrument as subject the set $S_{v,e}$ is a singleton containing the object that is denoted by the nominative argument. Only for the stem /kain/ no object is determined, so that in this case the instrument is singled out as denotation of the nominative argument. When taken together, this yields the (37).

(37) The subject that is determined by /i-/ for a stem v is that participant d of an event e $\in P_v$ such that

    a. either d is the unique element of $S_{v,e}$

b. or, if $S_{v,e}$ does not single out a unique participant of e, i.e., if $S_{v,e}$ is not a singleton, d is the instrument

7.2 The Subject determined by /-in/

If one considers only transfers of the sort expressed by stems of the 'kuha'-type, the subject determined by /-in/ is the Transferred Object y, similar to stems belonging to the 'bigay'-type when they combine with /i-/. The two VAs differ with respect to stems for which they are both admissible and for which they are used ditransitively. Examples are /hagis/, /saksak/ and Point-verbs like /puknok/. If they combine with /i-/, the subject is the Transferred Object y and not the Destination z. For the VA /-in/, the subject is the Destination z and not the Transferred Object y. The stem /akyat/ is similar to these three stems, although the argument structures differ (/-in/: transitive; /i-/: ditransitive). Whereas for /-in/ it is the Goal that is determined as subject, it is the transferred object which is singled out by /i-/.

As was shown in the preceding section, the difference between the Transferred Object y and the Destination/Goal z consists in the number (or types) of results that are assigned to them. The Transferred Object y is always assigned all v-closed results whereas this is in general not the case for z. A v-closed result is not necessary a strongest result, witness w-minimal results that are v-closed but not strongest if the event-type also determines s-maximal results.

If one considers strongest results instead of v-closed ones, a Transferred Object is always assigned all strongest results, as Table 7 shows.

Table 7	strongest	assigned to	non-strongest
/kuha/			
transitive	x has y	x, y	
ditransitive	x has y $\neg(z$ has $y)$	x, y (2), z	
/hagis/	y is at z	y, z	y traversed a path
/saksak/	y is in z	y, z	y traversed a path
/puknok/	y is at/on z	y, z	y traversed a path

The 'kuha'-type differs from the other stems in the following respect. For /kuha/ y is either the unique object that is assigned *all* strongest results (ditransitive use) or it is temporally maximal with respect to this condition (transitive use). If the subject is determined by the condition that it (i) be assigned all strongest results and (ii) be temporally maximal with respect to this condition, this yields exactly the correct prediction.

If, on the other hand, this criterion is applied to the other stems in Table 7, it is the Destination z that is determined because y is assigned a further, non-strongest result: y traverses a non-empty path. But this is again what is required because z is singled out as subject by /-in/. The difference to the case of /kuha/ is the following. There is only one strongest result and it is assigned to the Transferred Object y and the Destination z, and not to the Actor x, as in the case of /kuha/ (transitive use). Therefore, the maximality condition singles out z and not y because y is assigned a non-strongest result that is not assigned to z.

For other stems admitting /-in/ the above criterion can be used too.

Table 8	strongest	assigned to	non-strongest
/akyat/	x is at y	x, y	x traversed a non-empty path
/kain/	the mass of y is in x's stomach the mass of $y = 0$	x, y (2)	part of the mass of y is in the stomach of x partial decrease of y's mass

Table 8 illustrates this for the stems /akyat/ and /kain/. For the former, x and y are both assigned all strongest results but x is temporally minimal because it is assigned a result that does not hold for y such that y is temporally maximal A similar argument holds for stems like /sunod/ ('obey' if it combines with /-in/). For /kain/, y is already uniquely determined by the first condition because it is assigned both strongest results whereas x is assigned only one. An analogous argument applies to Achievement-verbs like /patay/ ('kill') and stems like /halo/ ('stir' if it combines with /-in/) and /kanta/ ('sing'). Thus, the above condition can be taken as the criterion which determines the subject for /-in/. It is repeated in (38).

(38) The subject that is determined by /-in/ for a stem v is that participant d of an event e $\in P_v$ such that

    a. d is assigned all strongest results from $Res(P_v, e)$

    b. d is temporally maximal with respect to condition (a)

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Niuean Nominalization[*]

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In this paper I will examine various aspects of the nominal clause of Niuean (a VSO Oceanic language of the Tongic subgroup as classified by Pawley, 1966, 1967). In Section 1 I will provide a basic analysis of non-derived Niuean nominal clauses, as described by Seiter (1980), Wilson (1989) and Massam and Sperlich (to appear). In Section 2 I will focus on derived nominalizations, particularly on the case system found therein, from a Minimalist perspective. Although the facts are somewhat ambiguous, as shown in Section 3, I will advance the hypothesis that Niuean, while an Ergative/Absolutive (E/A) language at the sentential level, has an intransitive Nominative structure in the nominal clause. This is of interest, because it has often been claimed, most recently and in detail by Alexiadou (1999), that nominal clauses have an ergative structure in a wide range of N/A languages, including Greek, English, Romance and Slavic languages, and Hungarian. In addition, in the typological study of Koptjevskaja-Tamm (1993) this type of nominalization is found only in SVO Nominative/Accusative (N/A) languages.

1. The Structure of the Niuean Nominal Clause

1.1. Basic Word Order

The unmarked word order of a Niuean DP is shown in (1), with an example in (2).

(1)   Order of elements

[CaP   Det/#   N   Mods   Dem   Gen]

(2)	(CaP	Det/#	N	Mods	Dem	Gen)
	e	*tau*	*mena*	*gahua*	*nā*	*haau*
	Abs/Com	Spec/Pl	thing	work	that	you(Gen)

"those tools of yours" (Seiter.117b.45)

The first element in the clause is a portmanteau element which marks both the case of the DP and whether it is proper/pronominal (henceforth termed simply *proper*), or common. In (3) I provide a paradigm of these particles which I term CaP (for **Ca**se, [+/- **P**roper]). (Seiter 1980 and Clark 1976 each make different analyses of these items.)

121

(3) Niuean CaP elements

Common

	Prep	Case	Art_common
Abs			e
Erg		h	e
Gen		h	e
Loc		h	e
Goal	ke	h	e
Source	mai	h	e
Topic	ko		e
Ben	ma		e
Comit	mo		e
Instr	aki		e

Proper

	Prep	Case	Art_proper
Abs			a
Erg		e	
Gen		h	a
Loc		i	a (human only)
Goal	ki	(i?)*	a (human only)
Source	mai	(i?)*	a (human only)
Topic	ko		
Ben	ma		
Comit	mo		
Instr	aki		a

*It is unclear whether the *i* on the goal and source prepositions is the Case marker or part of the preposition.

Although there are many as yet unsolved issues with the CaP element, it can be seen that there are three main types of DP: unmarked, marked for case, and prepositional. The prepositional cases divide into those which take marked case complements and those which take unmarked case complements. In addition, there are more case distinctions in the proper series than in the common series, and the proper article has a more irregular distribution than the common article.

The second element in the clause is another portmanteau item which marks specificity and number. The basic paradigm as described by Seiter (1980) can be laid out as in (4).

(4)

	Plural	Dual	Singular	No #
A. [+Specific] [+/-Definite]	tau	nā	Ø	N/A
B. [-Definite] [+/-Specific]	falu a	N/A	taha	N/A
C. [-Specific]	N/A	N/A	N/A	ha

The head noun follows the specificity/number marker, and it is in turn followed by modifiers, a demonstrative (classed here as another modifier), and a genitive phrase.

Putting the above description together with the mass of recent work on cross-linguistic nominal structure (for eg. Abney 1987, Bittner and Hale 1996, Giorgi and Longobardi 1991, Pearce 1998, Ritter 1992, Waite, 1994), I posit the structure in (5) for the Niuean DP. The KP

and ArtP (CaP) heads coalesce, as do the heads of DP and the #P most of the time (but see below, Section 1.b). Some problems here are that the nature of the position that the noun moves to is not clear, and it seems that the NP never has internal structure.

(5) <u>Nominal structure</u>

```
        KP                        (case)
       /  \
      Art_pr/comP                 (proper/common)
          /  \
         DetP                     (specificity)
            /  \
           #P                     (number)
              /  \
             FP      (?)
            /  \
          N_i    GenP
              /  \
           Mods    GenP
                  /  \
                 NP
                /  \
                   t_i
```
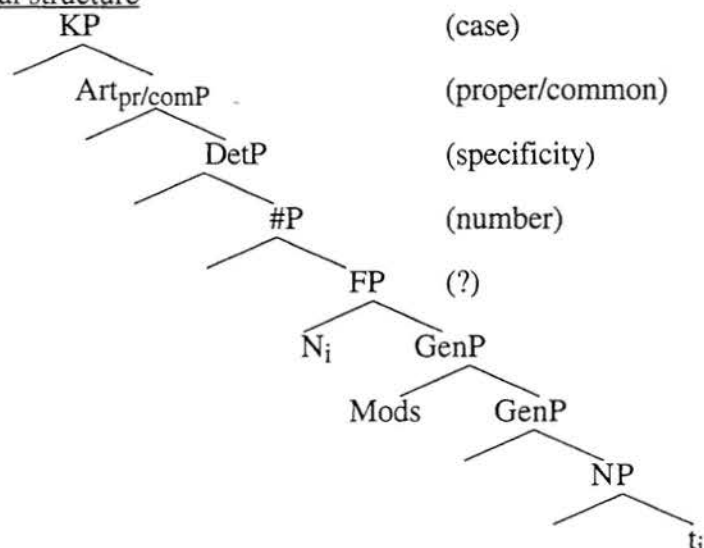
1.2. Prenominal Genitives (aka Possessive Preposing/Incorporation)

As well as appearing clause finally, the genitive can appear between the CaP and the number particle (or the N if there is no number particle), as shown in (6). The lack of the determiner on the right side of the arrow will be explained below. Examples are given in (7) and (8).

(6)   CaP Det/# N Mods **Gen** ----> CaP **Gen** *a* # N Mods

(7) a. *e   leo   ha   Sione*
        Abs voice   Gen   Sione   "Sione's voice"

     b. *(e)   ha   Sione   a   leo*
         Abs   Gen   Sione   a   voice   "Sione's voice"

(8) a. Ko *e*   *haana*   *a*   *tau*   *hui*
        CaP* 3sgGen   "a"   Pl   foot   "his feet"

     b. *Ko e*   *hana* *fale*
        TopCaP   his   house   "his house" (Sperlich.104)

(7b) shows that the preposed proper genitive is followed by the ligature item *a*. (8a) shows a preposed pronoun, also with *a*, which can be compared with (2). (8b) shows a shortened form of the pronoun which can appear prenominally, and it does not appear with *a*.

When the genitive is preposed, the DP receives a definite interpretation, as shown in (9). This means that a preposed structure will never appear with an overt determiner marking specificity, but just with an optional number marker (see (4)). Sperlich (1997) states that (8b) receives an even more definite interpretation than (9b).

123

(9) a. *Ko e   fale   haana*
         CaP   house   his   "his house/a house of his" (Sperlich.104)

     b. *Ko e   haana a   fale*
         CaP   his   Lig   house   "his house" (Sperlich.104)

A preposed genitive must be either a pronoun or a proper name (true also, interestingly, in German and Icelandic: Alexiadou 1999:113). Common noun genitives may not prepose. (See Massam and Sperlich, to appear for a discussion of how this preposing is treated in the literature on Polynesian.) Preposing can be accounted for by analyzing the genitive to be in the specifier of DP, as in (10) and considering the ligature *a* to be in the head of DP. Thus we see that Niuean has shifted preposing from the Tongic pattern of pronominal cliticization (Chung, 1973, Wilson, 1982) to an XP movement which includes proper genitives as well as pronominal ones. The ligature item might be related to the proper article *a*. If so, the proper/pronoun constraint on preposing follows from a properness agreement relation between head of DP and specifier of DP. The example in (8b) is analogous to the Tongan cliticization rule, where only short forms of the pronouns can appear in the head of DP, thus usurping the determiner *a*.

(10)   KP (case)
        ╱╲
      Art$_{pr/comP}$
        ╱╲
          DetP
         ╱╲
   <GenP   D'
             ╱╲
          a >   #P
         <hana >   ╱╲
                  #   FP
                       ╱╲
                     N$_i$
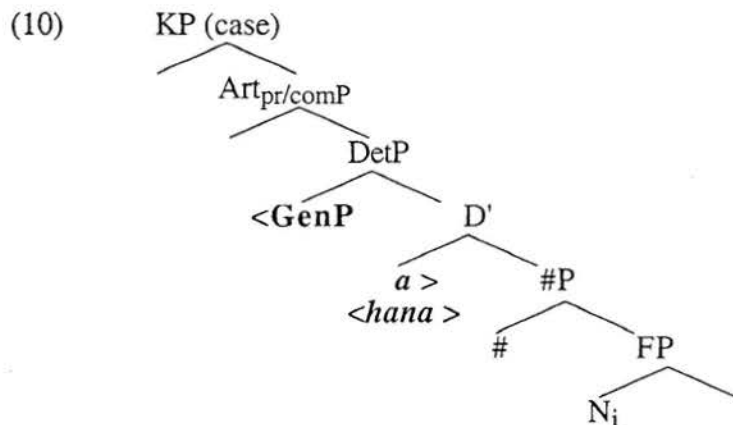
This provides us with the outline of the basic Niuean clause structure.

2. The Case of Nominalized Clauses

2.1. Nominalization in N/A languages (Alexiadou, 1999)

Alexiadou (1999) examines nominalizations in a variety of languages, including Greek and English. She concludes that "aspects of nominal syntax are closely related to patterns of ergativity" (p.2) and that "the light verb included in process nominals does not project an agent" nor does it assign accusative case (p.109). She provides the following structure.

(11)   DP   (from Alexiadou, 1999:21,193)

```
(11)               DP                  (from Alexiadou, 1999:21,193)
                 /    \
               D⁰      FP [= #P in a nominalization]
               the    /    \
                    AP      FP
                   /  \    /   \
                 F⁰       AspP
                        /      \
                      Asp'
                     /     \
                  Asp⁰      vP
                          /    \
                         v      LP
                               /    \
                             L⁰      Comp ( = theme)
                           √DESTROY  the city
```
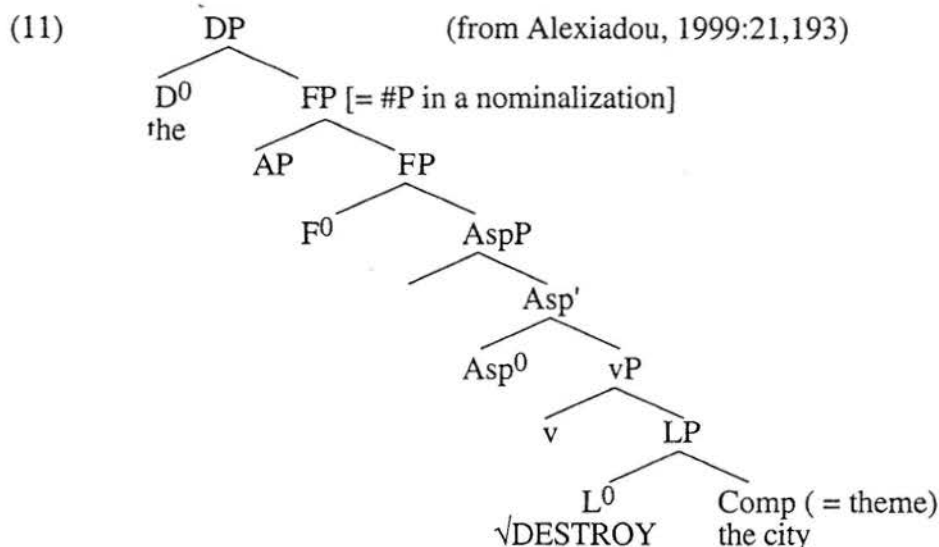
She considers the nominal to be a lexical root (L) which only acquires nominal status by virtue of appearing with nominal functional projections (cf. the concept of precategorial roots as in Foley, 2000). The lexical head moves to FP, which in a nominal would be #P, to be in the domain of the determiner and the object moves to specifier of AspP to check genitive case. (See Alexiadou, 1999 for full detail). The principal aspect of her analysis for us is that she argues that nominalized clauses have a deficient light verb, which does not assign accusative case, nor an external theta role. In this way, she claims, the light verb is an unaccusative light verb (see also den Dikken and Sybesma 1998, Harley and Noyer 1998, Marantz, 1997). Because the external theta role is not assigned to specifier of light v, it can appear only as an oblique (12a), a possessor (12b) or not at all (12c). This clears the way for the object to get the one available structural case - genitive - marked with *of* in English.

(12)   a. the destruction of the city by the Romans
       b. the Romans' destruction of the city
       c. the destruction of the city

Alexiadou develops the idea, often proposed in the literature, that in N/A languages nominalized clausal stucture is analogous to unaccusative, passive, and in particular, ergative clause structure, and she argues therefore that nominal clauses are ergative in structure. In her view, ergative languages have deficient light verbs also, which do not assign external theta roles, nor accusative case. For this reason, external arguments in ergative languages must appear in prepositional or oblique cases such as locative, genitive, or not at all. Alexiadou also points out that ergative arguments also share another property with by-phrases in nominal clauses: they are secondary cases in that they are only possible if there is a theme expressed.

Given the hypothesis that nominalizations are ergative in N/A langauges, it is interesting to ask what case patterns nominalizations show in ergative languages (see Koptjevskaja-Tamm, 1992 for many other examples). On the one hand, since ergative languages already have a deficient light verb (but see below for a different view), we might expect that in an ergative language the case system of the nominal phrase will be identical to the verbal phrase. On the other hand, we might find a sort of antipassive situation (as discussed by Silverstein, 1986). The argument which targets and eliminates the external case/argument in a N/A language, might well target and eliminate the internal case/argument in an E/A language. In the next section, I

125

will argue that it is essentially the latter situation we find in Niuean, though as I will demonstrate in Section 3, the data remain somewhat ambiguous on this point.

2.2. Nominalization in an E/A language

Examples of nominalized clauses appear in (13).

(13) a. *Ne*   *tāmate*   *e* *Tofua*   *e*   *kulī*
       Pst kill   **Erg** Tofua **Abs** dog
       "Tofua killed the dog."

   b. *ke he*   *tāmate*   *e*   *Tofua e*   *kulī*
       GoalCaP kill   **Erg** Tofua **Abs** dog
       "(about) Tofua's killing the dog" (Seiter.82a.119)

(14) a. *e*   *tele*   *haaku*   *i*   *a*   *ia*
       Abs   kick   **meGen** Loc Art   him
       "my kicking him" (Seiter.89b.121)

   b. *e*   *pākia*   *haaku*   *he*   *pilu*   *nā*
       Abs   injured   **meGen** on   knife   that
       "my being injured on that knife" (Seiter.83b.119)

   c. *e*   *fano*   *he*   *tagata*   *ia*   *ki Niu*   *Silani*
       Abs   go   **Gen** **man**   that   to New   Zealand
       "that man's going to New Zealand" (Seiter.84b.119)

Nominalizations in Niuean can be formed by simply replacing the Tense-Aspect-Mood particle (TAM) with a CaP particle, as in (13a,b). The rest of the clause is unchanged. Another option is shown in (14a,b,c) where, as well as the TAM becoming a CaP, we also see case changes. In particular, in (14a) the argument which would be ergative in a verbal clause is expressed as genitive in the nominal clause, and the argument which would be absolutive in the verbal clause is expressed as locative in the nominal clause. Finally we see two examples of intransitive clauses in (14b,c), one semantically active and one semantically passive. In both of these, the argument which would have been absolutive in the verbal clause appears in the genitive case.

I will henceforth employ the "ASO" terminology of Dixon (1979, 1994). I will use A to refer to the agent of a transitive clause, S to refer to the single argument of an intransitive clause and O to refer to the other argument of a transitive clause. We can see that A and S pattern together in taking genitive case in the nominalized clause, hence, that Niuean exhibits an nominative pattern in the nominalized clause, as seen in (15). This was observed by Seiter (1980) as evidenced in his naming the locative case in nominalized transitive clauses "fake accusative". He states (p.302) that this case is bizarre, since it is not clear why absolutive could not be used to mark the object, as in verbal clauses. (He provides a historical discussion which we will not review here, except to note that the Niuean locative is morphologically the same as the accusative in other Polynesian languages.)

126

Table 1 (see Alexiadou, 1999)

	English clause	Nominalization	Niuean clause	Nominalization
A:	Nom	{PP,Poss}	Erg	Gen
O:	Acc	Gen	Abs	Loc
S:	Nom	Gen	Abs	Gen

In providing an analysis of the Niuean nominalized clause, it is necessary first to show that Alexiadou's characterization of ergativity does not fit Niuean. There are two principal reasons why it does not. First, the ergative DP in Niuean does not act as an oblique or prepositional argument for any operation, such as wh-extraction, quantifier float, raising, etc. Second, the [Pred/Erg/Abs] word order of Niuean does not allow for an analysis in which absolutive moves to check case in a position higher than the ergative DP (such as in Specifier of TP, for example), which is what we would expect if the ergative were an oblique case within VP. Instead, I propose that Niuean has a rich, fully functional transitive light verb which in a transitive clause checks case (abs) against the internal argument and also assigns an external theta role along with an inherent case to its specifier position (Woolford, 1997, Ura, 1998). This is schematized in (15).

(15) <u>Transitive Clause</u>

```
            vP
           /  \
          A    vP
              /  \
                 v'
               /   \
             v0     VP
            [abs]   / \
           [ag/erg] V   O
```
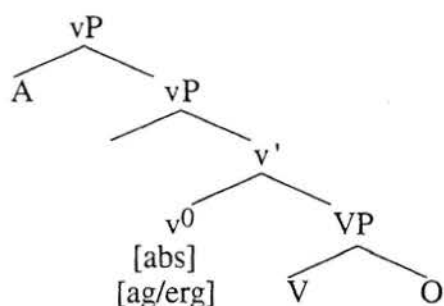
What is different about Niuean (vs English), then, is that the agent receives case in situ and that absolutive is "super strong" and must be checked immediately, prior to merge of the external object, violating Chomsky's (1995) claim that Merge will always occur before Move. (Another option is that the object moves after merge of the subject, but that it "tucks in" (Richards 1997). A transitive vmax, then, has two specifiers, one by move and one by merge. Intransitive clauses are as in (16).

(16) <u>Intransitive Clause</u>

```
            vP
           /  \
               v'
             /   \
           v0     VP
          [abs]   / \
                 V   S
```
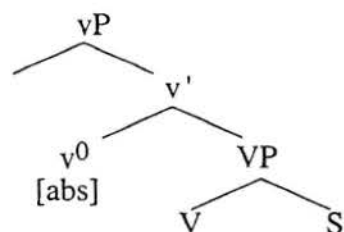
The intransitive light verb here is lacking the external case/theta package but retains absolutive case, which causes the internal argument to undergo object shift. For unergatives,

this same analysis might hold, or the single S argument could be merged directly into specifier of the light verb to maintain the unaccusative/unergative distinction (for which I have found no evidence in Niuean). Either way, all S arguments check absolutive case in specifier of vmax.

We now turn to nominalization clauses, where the light head is deficient, just as it is in Alexiadou's analysis. In Niuean, the light verb, more properly termed a light noun since it has such a different feature composition, is as in (17). Its deficiency, compared to the verbal counterpart lies in the absence of absolutive case. Also, in the light noun, the external case is not tied to a particular theta role, unlike the ergative case.

(17) Transitive Nominalization
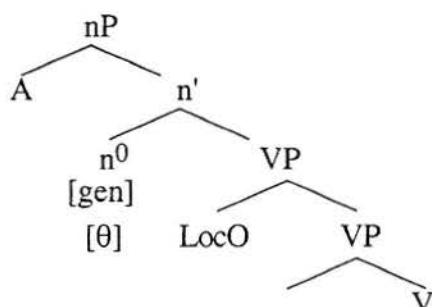
(18) Intransitive Nominalization
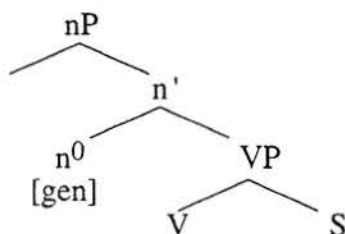
One assumes here that the absence of absolutive case rules out the possibility for a direct object. There is no way for the internal argument to get direct case, hence it must appear in oblique locative case (parallel to the external argument appearing as a by-phrase in English nominalizations). But the question remains why it is not possible for the object to undergo object shift to receive genitive case, thereby forcing the external argument to be inexpressable as a direct argument. This is because genitive, unlike absolutive, is not "super strong", but merely strong, thus merge of the external argument will precede movement of the internal argument. When the external argument is merged, it checks genitive case. In intransitive nmax clauses, if there is no external theta role to be assigned, the internal argument is called upon to undergo move to check genitive case. Transitive nominalizations in Niuean are thus unergative-like in that the light noun assigns an external theta role and case, but there is no direct object, no accusative case. Instead, the object appears as a locative oblique. Alternatively we could view locative as accusative, as Seiter does, but since it has the morphology of locative, I consider it oblique. The analysis of the case of O as oblique renders Niuean nominalization different from other Polynesian languages, and also different from other ergative languages. According to Koptjevskaya-Tamm (1992), the pattern of genitive A,S and oblique O is limited to SVO N/A languages.

128

3. Two Unsolved Problems

The above analysis is interesting in cross linguistic terms and it accounts for the Niuean data presented so far. There are two crucial problems remaining however, which I cannot fully explain as yet. First, it is not always possible for an A argument to be expressed as genitive, in particular, a common A argument may not be expressed as a genitive. Second, it is possible, under certain circumstances, for the O argument to be expressed as a genitive argument. This latter situation is shown in (19), which, according to Seiter (1980) is a "formal" register construction. In (19), the O is genitive, and the A is ergative.

(19) *e*   *kotofa*   *haaku*   *e*   *lautolu*   *ke*   *fakamatala*
      Abs   choose   meGen   Erg   they   Sbjnctv   speak
      "my being chosen by them to speak" (Seiter.87a.120)

Each of the above facts might provoke a completely different analysis from the one presented in this paper, more in line with that of Chung (1973) who claimed that no A argument, only S arguments can be genitive in Niuean. In other words, an analysis which rules out A as Genitive is half right and an analysis which rules in A as Genitive is half right. The first would be a E/A analysis, and the second, an N/A analysis. Also, if the construction in (19) is fully admitted into the paradigm, then O can be Genitive, also suggestive of a E/A pattern.

It is not directly apparent that a common A argument cannot be ergative, since common ergative and common genitive are both marked with *he*. Nonetheless we know, as Seiter (1980) demonstrates, that the case of *he kulī* "dog" in (20) is ergative and not genitive, as the O argument in this clause must have absolutive and may not have locative case. Absolutive partners with ergative, not genitive case.

(20)a. *e*   *gagau he*   *kulī*   *kø*   *a*   *au*
        Abs   bite   Erg   dog   that   Abs   me
        "That dog's biting me." (Seiter.91a.121)

   b. **e*   *gagau he*   *kulī*   *kø*   *i*   *a*   *au*
       Nom   bite   Gen   dog   that   Loc   Pers   me
       ("That dog's biting me.") (Seiter.91b.121)

The full range of possibilities in Niuean is thus as shown in (21). Note that if the genitive in a nominalized clause is proper, it can undergo preposing, just as a genitive in a non-derived clause.

(21) A_{proper} can be genitive
      A_{common} cannot be genitive
      S can be genitive
      O can be genitive but is marked, **formal**

      A_{proper} can be preposed
      S_{proper} can be preposed
      O cannot be preposed
      A,S_{common} cannot be preposed

I do not have an explanation for why common A arguments cannot be genitive. Seiter suggests it is not possible because the genitive *he* marking in a nominalized clause would be

ambiguous between common ergative and common genitive. It does seem suggestive that the two case markings are identical, which is not the case for proper ergative (*e*) and proper genitive (*ha*), or common or proper absolute (*e,a*) and common or proper genitive (*he,ha*). But it is difficult to see how this could be formalized.

As for the situation with O being realized as genitive, as in (19), I depend here on Seiter's observation that this construction is a marked one, restricted to a formal register. If it is a frozen sentence type, we can explain why the genitive O, even if proper, cannot be preposed.

4. Conclusion

In conclusion, if we put aside the two cases discussed in the preceding section, it appears that Niuean, an E/A language in the verbal clause, switches to an intransitive Nominative system in the nominalization system. In this, it appears to exhibit a reverse situation of that presented for N/A languages such as English, by, for example, Alexiadou (1999). Many N/A languages are said to switch from a N/A system in the verbal clause to an unaccusative system in the nominalization system. Niuean is also unusual in the typology developed in Koptjevskaya-Tamm in that it is a VSO E/A language exhibiting a pattern of nominalization found by her only in SVO N/A languages.

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Valence changing clitics and incorporated prepositions in Teop
(Oceanic, Bougainville, PNG)

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1. Introduction

Our paper examines valence changing clitics and incorporated prepositions in Teop, an Oceanic language of the Meso-Melanesian Cluster[2] which is spoken on the north east coast on Bougainville. For practical reasons, the investigation will be strictly synchronic.

2. The structure of the verb complex

Teop has a highly complex verb phrase which besides the nucleus and TAM markers can contain the following elements:

- a discontinuous negation
- an incorporated noun
- a serial verb
- a directional particle
- several adverbs
- a valence changing clitic or an incorporated preposition
- the 3rd person plural object marker.

The boundaries of the verb phrase are defined by TAM markers which hold the initial and the final position. The final TAM marker is a portemanteau morph which indicates imperfective aspect and person. Typical examples are the following:

(1) E bubuu **na** hio ihuana **nana** bona nahu kaukau.
     ART granny REAL sit wait.for IMPF:3SG ART pot sweet potato[3]
     'Granny is sitting waiting for the pot of sweet-potatoes.' (pr. 4.27)[4]

Example (1) shows the TAM markers na and nana which enclose the serial verb construction *hio ihuana* 'sit and wait for'.
In example (2)

(2) Ean sa **paa** rake haa bata   maa **nom** a beiko te-naa.
     2SG NEG PAST like NEG at.the.same.time DIR IMPF:2SG ART child PREP-1SG
     'At the same time you did not like my child.' (Ioanna)[5]

we find:
- the discontinuous negation sa ... haa,
- the past tense marker paa
- the nucleus rake 'like'

- the adverb <u>bata</u> 'at the same time'
- the directional marker <u>maa</u> 'hither, towards me or the deictic centre',
- and <u>nom</u>, the imperfective aspect marker of the second person singular. This form is also used for first person singular, exclusive plural, and the second person plural.

The two examples also show the basic word order of transitive clauses, namely:

subject + verbal predicate + object

3. Valence of verbs and verb complexes

As Margetts (1999) has recently shown for the Oceanic Papuan Tip language Saliba, we have to distinguish between the valence of verbs and the valence of verb complexes, because the valence of the verb and the verb complex may be different. In Teop, for instance, an intransitive verb can be combined with an applicative clitic or an incorporated preposition which makes the verb complex transitive. On the other hand, an intransitive verb complex can be formed by the combination of a transitive verb with an incorporated object.

Teop has intransitive, transitive and ditransitive verbs and verb complexes. An example for a ditransitive verb is <u>hee</u> 'give' as in the following example:

(3)   <u>Eam toro hee e   beera bono kahoo guu.</u>
       2PL   must give ART chief ART   head pig
       'You must give the chief the pig's head.' (TD <u>hee</u>)[6]

Here the verb complex <u>toro hee</u> 'must give' is also ditransitive. The semantic roles of the two objects of ditransitive verbs and verb complexes are not confined to Recipient, Benefactive or Addressee and Patient as in (3). In our data we also found several examples of activity verbs whose first and second object denote a patient and an instrument as in (4)

(4)   <u>Miriki a   beiko bona ta   naono.</u>
       strike ART child ART   piece wood
       'Strike the child with a stick.' (TD <u>miriki</u>)

The core arguments of intransitive, transitive and ditransitive predicates do not need to be expressed if the participants can be identified from the context.

4. Articles

Noun phrases start with an article. The paradigm of articles is rather complex and cannot be described here.[7] For the present paper it is sufficient to know that there are - among others -

1. the basic articles a, e and o as in (1) e bubuu 'granny' and in (2) a beiko tenaa 'my child' and
2. the object articles bona, bene and bono as in (1) bona nahu kaukau 'the pot of sweet-potatoes'.

The object articles are used with object noun phrases provided that the object follows the verb complex, and that the subject is a third person singular as in example (1). Otherwise the object noun phrase has the basic article as in (2) where the subject is a first or second person. Which of the basic articles a, e, o or the object articles bona, bene, bono is selected depends on the noun class of the noun. The article selection rule also applies for the first object of ditransitive predicates. Depending on the person of the subject, the object takes either the basic article or the object article. The second object, however, is always marked by the object article; for example bono kahoo guu in (3) and bona ta naono in (4).

5. The valence changing clitics ni and me/mi

The valence of verb complexes can be increased by the clitics ni and me/ mi which never occur outside the verb complex. As will be shown in a minute, both clitics can be compared to applicatives in other languages according to the definition given by Baker (1996):

(5)   Applicatives are standardly characterized as constructions in which a derivational morpheme is attached to the verb resulting in the verb taking a new nominal as its surface object. Thus, the applicative form of an intransitive base verb acts like a transitive verb, while the applicative form of a transitive base verb acts like a ditransitive verb. This new 'applied' nominal expresses a thematic role that otherwise would have to be expressed obliquely or not at all. (BAKER 1996: 427)

(6)   ni   applicative clitic marking an object whose semantic role is determined by the lexical semantics of the verb
        me/mi applicative clitic marking a comitative object

135

5.1. The applicative clitic ni

The clitic ni transitivises intransitive verb phrases. Example (7)

(7)   A moon na gavagava nana.
        ART girl REAL angry   IMPF:3.SG
        'The girl is angry.' (TD gavagava)

shows an intransitive verb complex. In example (8)

(8)   E bubuu na gavagava **ni** nana   **bene Sovavi**.
        ART granny REAL angry   APPL IMPF:3.SG ART   Sovavi
        'Granny is angry with Sovavi.' (pr. 3.19)[8]

the verb complex na gavagava nana is transitivised by ni and governs the object bene Sovavi.

Our data do not provide any example in which ni makes a transitive verb complex ditransitive, but there are examples in which ni increases the semantic transitivity in the sense of Hopper & Thompson's (1980) notion of transitivity. For instance,

(9)   ato v.t., touch s.th., ato ni v.t., hold onto s.th.

In (10)

(10)   ... eove he **ato** bona metatono.
         3SG CONJ touch ART eel
        '... he touched the eel.' (pr. 5.25)[9]

the eel is only touched, whereas the object in (11)

(11)   **Ato** vakikisi **ni-** a   taba.
        hold strongly APPL -ART thing
        'Strongly hold onto the thing' (for instance, a wriggling fish you have in your hand).
        (TD ato)

is hold against its resistance. Another example is

(12)   rahi v.t., pull (a string, fishing line), haul (a canoe),
        rahi ni v.t., catch (fish with a fishing line) (TD rahi)

This corresponds to Hopper and Thompson's (1980) notion of transitivity as a graduable property of clauses. They observed that clauses expressing a high degree of affectedness of the object are often also formally more transitive than those with less affected objects.

The semantic role of the applied object is directly related to the lexical semantics of the verb and seems to be predictable. It expresses for example

(13)   the CONTENT with verbs of speech and thought
          moroko 'speak'   moroko ni 'speak about'

       the CAUSE with verbs of physiological reactions
          dadana 'shake, shiver' dadana ni 'shake, shiver because of'
          mate 'die'   mate ni 'die of'
          tagune 'wake up'   tagune ni 'wake up from'

       the STIMULUS/TARGET of psychological verbs:
          mararae 'be happy'   mararae ni 'be happy about'
          naabu 'be afraid'   naabu ni 'be afraid of'

       the INSTRUMENT of activity verbs
          kiki 'play soccer'   kiki ni 'play soccer with (the ball of ...)' (pr. 5.13)

There do not seem to be constructions with oblique arguments which would correspond to the transitive constructions with ni. Thus 'to speak about', 'shiver because of', 'die of' etc. can only be expressed by the applicative construction. In other words, the ni-constructions do not serve as a means of promoting oblique arguments to core arguments.

5.2. The applicative clitic me

The applicative clitic me/mi is similar to ni, the only difference being that the semantic role of the applied object is always CONCOMITANCE. Typical examples are found in

(14)   tei (itr.) 'live, stay, be' tei me/mi (tr.)   'be with, have s.th.'
       toho (itr.) 'play'   toho me/mi (tr.) 'play with s.o.'

Examples (15) and (16) show the contrast between the intransitive construction of tei and the transitive construction of tei ni.

(16)   Na tei nana te-a   inu a   rutaa.
       REAL be IMPF:3SG PREP-ART house ART small
       'He stays in a small house.' (TD tei)

(16)   A beiko na tei mi nana   bono kaakan ...
       ART child REAL be with IMPF:3SG ART   worm
       'The child has worms...' (TD tei)

As with ni, we do not have any examples of di-transitivisation.

6. The incorporation of prepositions

The valence of verb complexes can be increased by the incorporation of one of three prepositions. These prepositions are:

(17)   ki / ka-   'for, to' (recipient, benefactive, addressee)
        kahi   'from' (source)
        suku   'because of' (cause)

Prepositional phrases introduced by ki can function as a predicate in non-verbal sentences and as adjuncts as in (18) and (19).

(18)   A- maa toogori **ki** **bene teiee**?
       ART-PL   toogori   for   ART   who
       'The toogori (fish) are for whom?' (pr. 3.57)

(19)   Enam na von **a** sosepene a   voon **ki** **bene iaa**.
       EXC   REAL buy   ART saucepan   ART new   PREP ART   Mum
       'We bought a new saucepan for Mum.' (elicited)

When the prepositional phrase functions as a predicate or an adjunct, the noun phrase governed by ki has the object article. In (19), the PATIENT NP a sosepene a voon 'a new saucepan' is the direct object and the RECIPIENT ki bene iaa 'for Mum' is the adjunct. According to the article selection rule, the PATIENT NP has the basic article and the RECIPIENT NP has the object article.
But when ki is incorporated, the RECIPIENT becomes a direct object as in (20):

(20)   Enam na von **ki** ma-e **iaa** **bona** nahu a   voon.
       EXC   REAL buy   for DIR-ART Mum ART   pot   ART new
       'We bought Mum a new pot.' (TD nahu)

Here the RECIPIENT NP (e iaa) has the basic article because it is the direct object and the subject is not a third person. The PATIENT NP bona nahu is the second object and has the object article.

The examples (19) and (20) show that incorporation of ki promotes the adjunct to a direct object and at the same time demotes the former direct object to a second object. Thus the incorporation of ki here makes a transitive verb complex ditransitive.
An example of transitivisation is given in (21) and (22):

(21)   Na aheahe nana.
       REAL sing   IMPF:3G
       'She is singing.'

(22)   Na aheahe **ki** nana **bene Satoka** ...
       REAL sing   for   IMPF:3SG ART   Satoka
       'She is singing for Satoka.' (pr. 4.19)

The examples (23) to (26) show the incorporation of the prepositions kahi and suku.

In (23) <u>kahi</u> 'from' introduces an adjunct, whereas in (24) it is incorporated.

(23) <u>Huriki</u> <u>a</u>   <u>rokoroko</u> <u>vaarau</u> <u>a</u>   <u>mate</u> **kahi bona hanana**.
      remove ART frog   DEM   ART dead from ART   road
      'Remove the frog from the road.' (TD <u>huriki</u>)

(24) <u>E</u>   <u>Kakato</u> <u>na</u>   <u>rosin</u> **kahi** <u>bata</u>   <u>maa-na</u>   **bona otei**.
      ART Kakato REAL   run   from simultaneously DIR- IMPF:3SG ART   boy
      'Kakato is running away from the boy towards me.' (TD <u>kahi</u>)

Similarly, the preposition <u>suku</u> 'because of' introduces an adjunct in (25) and is incorporated in (26).

(25) <u>A</u>   <u>maa</u> <u>ta</u> <u>vaan</u> <u>na</u>   <u>aun</u> <u>kahi</u> <u>bona</u> <u>maa</u> <u>vaan</u> <u>te-ori</u> **suku**   **bona puana**.
      ART PL   people REAL leave from ART   PL   village PREP-3PL because.of ART   war
      'The people left their villages because of the war.' (TD <u>suku</u>)

(26) <u>A</u>   <u>beiko</u> <u>moon</u> <u>na</u>   <u>arata</u> **suku**   <u>nana</u>   **bene sina-na-e**   <u>to</u> <u>kare</u>   <u>mate</u> <u>koa</u>.
      ART child   woman REAL grieve because.of IMPF:3SG ART   mother-POSS.3SG REL recently die   just
      'The girl is grieving because of her mother who just recently died.' (TD <u>suku</u>)

7. Conclusion

To conclude, there are two different kinds of applicatives in Teop. The transitivising particles <u>ni</u> and <u>me</u> which only occur within the verb complex and the incorporated prepositions <u>ki</u>, <u>kahi</u> and <u>suku</u>. The clitics <u>ni</u> and <u>me/mi</u> transitivise intransitive verb complexes, and <u>ni</u> increases the semantic transitivity of clauses. The preposition <u>ki</u> makes intransitive verb complexes transitive and transitive verb complexes ditransitive. Our paper also showed that it is very useful to distinguish between the valence of verbs and the valence of verb complexes.

	with intransitive verbs	**with transitive verbs**	**effect on the clause**
ni	transitivisation	increase of semantic transitivity	the only way to express a certain state of affairs
me	transitivisation	--	
ki	transitivisation	ditransitivisation	change of grammatical relations

Notes

[2] Ross 1988:215 ff.

[3] Abbr.: ART article, APPL the applicative clitic ni, CONJ the conjunction he, DIR directional particle, EXC 1st pers. plural exclusive, IMPF imperfective aspect, NEG negative particle, PAST past tense, PL plural, POSS possession, PREP multifunctional preposition te, REAL realis, REL the relative marker to, SG singular, TAM tense-aspect-mood.

[4] pr. 4.27 = Saovana-Spriggs 1988:27.

[5] From an interview done by Saovana-Spriggs with Joanna Vosunana Kaetamana in 1994.

[6] TD: from the Teop-English dictionary, Mosel and Spriggs 1999c.

[7] For further information cf. Mosel and Spriggs 1999b.

[8] pr.3:19 = Saovana-Spriggs & Dubert 1988a:19.

[9] pr.5.25 = Spriggs n.d.:25.

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Emotion Predicates and Grammatical Functions in Indonesian

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1. Introduction[1]

This paper deals with a group of predicates in Indonesian and their status in regard to the syntactic transitivity system of that language. These predicates are part of a larger group which are characterised by their syntactic behaviour and by their semantics. Syntactically, these predicates appear to be intransitive in that they do not take the transitive verb prefixes *meN-* and *di-*, but they can have a second argument which is coded as a prepositional phrase. Semantically, with one exception, these predicates denote emotional and cognitive states. Typical examples are the predicates *puas* 'content, satisfied' and *salut* 'respect, admire'[2]:

1.

Dan	*mereka*	*juga*	*sudah*	*puas*	*dengan*	*kasus*	*wanita*
and	3pl	also	PERF	content	with	case	woman

yang	*hilang*	*itu?*
REL	lost	that

'And were they also satisfied with the case of the woman who disappeared?' (SDPGS: 128)

2.

ia	*bannga*	*dan*	*salut*	*akan*	*kesadaran*	*Sandy*
3sg	proud	and	respect	about	NOM.aware.NOM	Sandy

'she was proud and respected Sandy's attention' (PYD:19)

Some of these predicates can also appear in a construction where the second argument, which I will refer to often as the stimulus (of the emotion or cognition), is coded as a simple NP. That is, the clause has what look like two direct arguments as seen in the following examples:

3.

Kamu	*lupa*	*rumahku?*
2sg	forget	house.1sg

'You have forgotten my house?' (SDM: 96)

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[2] The following abbreviations are used in glosses: 1,2,3 - 1st, 2nd, 3rd person, sg - singular, pl - plural, APPL - applicative, EX - exclusive, FUT - future, INT - intensifier, LOC - locative preposition, NEG - negation, NOM - nominalizer, PERF - perfect aspect, PROG - progressive aspect, RED - reduplication, REL - relative clause marker. The verbal prefixes *meN-* and *di-* are left unglossed throughout. The abbreviations used for sources of examples are explained at the conclusion of the paper.

4. *Ia   kuatir   suratnya   tidak   sampai*
    3sg   fear   letter.3   NEG   arrive
    'She was afraid her letter would not arrive.' (ES: 313)

5. *Aku   takut   wanita   yang   aku   cintai   ternyata*
    1sg   fear   woman   REL   1sg   love.APPL   apparently
    tidak   mencintaiku
    NEG   meN.love.APPL.1sg
    'I am afraid of the woman that I love, apparently she doesn't love me.' (PYD: 12)

6. *Cuma   aku   tidak   suka   omongannya   yang   sok   suci,*
    only   1sg   NEG   like   gossip.3   REL   as.if   pure
    'I just don't like his gossip that takes the moral high ground.' (PYD: 87)

7. *Saya   nggak   senang   wartawannya*
    1sg   NEG   like   journalist.3[3]
    'I don't like journalists.' (McKay)

However, as will be shown in detail below, such clauses are not syntactically transitive. The question this paper seeks to answer then is what grammatical function is assigned to the stimulus argument in a clauses such as examples 3 to 7?

I attempt to answer this question using the theoretical resources of Lexical Functional Grammar (LFG). This framework assumes a constrained list of grammatical functions (GFs): subject (SUBJ), object (OBJ), oblique (OBL_θ) and second object (OBJ_θ). The last two GFs are subscripted with a theta because in the case of OBJ_θs their thematic role is assumed to be restricted within any particular language (Bresnan and Kanerva 1989), and in the case of OBL_θs their thematic role is indexed by the adposition or case marker which licenses them. These GFs are not configurationally defined. They are elements of f(unctional)-structure, a structure which is distinct from but parallel to c(onstituent)-structure (Bresnan, to appear: 55-63). Syntactic properties other than configurational ones are therefore of primary interest in this investigation.

The group of predicates of interest here includes the following words:

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[3] The possessive clitic *-nya* is used here to indicate that the referent is identifiable.

8.	*berang*	angry, irate	*mimpi*	dream
	bosan	bored	*mirip*	resemble
	gila	crazy, obsessed	*peduli*	care about, pay attention
	kangen	miss, long for	*percaya*	believe
	kasih	love	*sayang*	love, pity
	kasihan	love, pity	*senang*	happy, like
	kuatir	fear	*suka*	like
	lupa	forget	*takut*	fear
	marah	angry	*yakin*	sure

This list is not exhaustive; rather it includes just those words for which I have clear examples from texts. Also, several words are left out of this list which might have a claim to be included. These words (*benci* 'hate', *ingat* 'remember' and *percaya* 'believe') all occur in the construction of examples 1 and 2. But they also all have related transitive verbs which are not derived with an applicative suffix (*membenci, mengingat* and *mempercaya*). Therefore it is not possible to say whether clauses with these predicates and a NP stimulus are examples of the construction seen in examples 3 to 7, or whether they are rather examples of the unprefixed transitive verb construction exemplified in example 15 below. Given this unclarity, it is preferable to omit these predicates from my discussion.

The translations given above suggest that many of these words have an adjectival character. Whether Indonesian has adjectives as a lexical category or not is a disputed question (see Cumming 1991 and Mahdi 1998 for differing views), and the evidence is particularly unclear for the words under consideration. For example, *ter-* prefixation derives adjectival superlatives for most of the words with which it is possible (e.g. *tergila* 'most crazy', *termarah* 'most angry'), but some verbal derivatives occur also (e.g. *terlupa* 'forget accidentally'). Indonesian allows all major phrasal categories to function as the predicate of a clause, that is verbs (see examples such as 12), nouns, prepositions and putative adjectives can all head the predicate constituent:

9.   *Ini*   *keputusan*   *saya*
        this   NOM.decide.NOM   1sg

'This is my decision.'

10.   *Mereka*   *di*   *Jakarta*   *sekarang*
        3pl   LOC   Jakarta   now

'They are in Jakarta now.'

11.   *Mencari*   *pekerjaan*   *di*   *kota*   *tidak*   *begitu*   *mudah*
        meN.find   NOM.work.NOM   LOC   city   NEG   like that   easy

'Finding work in the city isn't very easy.'

It is uncontroversial that all of these predicate types assign a SUBJ grammatical function, and a maximally general account of Indonesian syntax must be based on the assumption

that if they assign other clause-level grammatical functions, these should also be part of the inventory provided by our theory[4]. Therefore, the question at issue here remains the same under either categorial analysis. I will leave the question of category open here, and will continue to use the neutral term *predicate* in this paper.

The data presented in this paper does not represent standard Indonesian. Many of the examples are drawn from contemporary, popular novels, one set in Jakarta (SDM) and one set in Surabaya (PYD). The majority of the characters in both novels are educated people, and in conjunction with the judgments of the native speakers with whom I have worked, this data may be said to represent the careful speech of educated Indonesians[5].

Section 2 of the paper examines the evidence that constructions such as those in examples 2 to 7 are distinct from normal transitive clauses in Indonesian, and shows that the stimulus is neither a SUBJ nor an OBJ. Sections 3 and 4 examine evidence which might show that the stimulus is an OBL_θ or an OBJ_θ respectively, concluding that the second possibility is to be preferred. Section 5 discusses some theoretical consequences of this analysis and compares these to the consequences of instead claiming that bare NP stimuli in Indonesian are examples of some grammatical function not yet recognised by LFG.

2. Transitive Clauses - SUBJ and OBJ

The overwhelming majority of transitive verbs in Indonesian can appear in four types of clause:

12.
Dia	membaca	buku	itu
3sg	*meN*.read	book	that

S/he read the book.

13.
Buku	itu	dibaca	(oleh)	Ali
book	that	*di*.read	(by)	Ali

The book was read by Ali.

14.
Buku	itu	saya	baca
book	that	1sg	read

The book, I read.

15.
Dia	baca	buku	itu
3sg	read	book	that

S/he read the book.

Various restrictions apply to the constructions exemplified in 12 to 15 which need not concern us here. Clauses with emotion predicates look the same as the type exemplified in 15, but the other clause types are not possible:

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[4] There is also the possibility that clauses such as examples 9, 10 and 11 should be analysed as containing a zero copula, a possibility which I ignore here.

[5] The two native speakers whose judgments are reported here are both Javanese. The issue of whether the phenomena discussed here are affected by the speaker's first language (if that is not Indonesian) remains for future research.

16. *Aku bosan hidup terus-menerus di Surabaya*
   1sg bored life continue-*meN*.continue LOC Surabaya
   'I am fed up with monotonous life in Surabaya.' (PYD: 180)

17. **Aku membosan hidup terus-menerus di Surabaya.*

The type of clause illustrated in example 13 is not possible with a first person actor, but substitution of a third person actor does not make this construction possible with this predicate:

18. **Hidup terus-menerus di Surabaya dibosannya.*

The type exemplified in 14 is not possible either, although the direct manipulation of example 16 yields a sentence which does have a reading:

19. *Hidup terus-menerus di Surabaya aku bosan.*

   'This monotonous life in Surabaya, I am fed up with it.'

This clause requires an intonation distinct from that associated with clauses of the type seen in example 14 with a pause after the initial NP which is a topicalised constituent, and the addition of an auxiliary verb to the sentence makes the distinction absolutely clear. In a construction of the type in example 14, the actor pronoun remains adjacent to the main verb even when an auxiliary or modal is included, but in emotion predicate clauses, the actor pronoun appears to the left of an auxiliary:

20. *Buku itu akan saya baca.*
   book that PROG 1sg read
   'I will read that book.'

21. *Hidup terus-menerus di Surabaya aku akan bosan.*

   'This monotonous life in Surabaya, I will be fed up with it.'

22. **Hidup terus-menerus di Surabaya akan aku bosan.*

This evidence shows that these predicates are not syntactically transitive.

This status alone may be enough to show that the stimulus argument of an emotion predicate is not an OBJ. If OBJ is defined as the non-SUBJ argument of a transitive verb, then stimuli are not objects because the predicate that they are associated with is not syntactically transitive[6]. A more stringent test requires OBJs be able to become the SUBJ of a related clause, typically a passive. Leaving aside the issue of whether the related clause types in Indonesian should be described as passive, it is clear that stimuli also fail this test as seen in example 18. Many of the emotion predicates derive true transitive verbs with an applicative suffix, and a comparison of their properties with the basic predicates is instructive. The applicativised verbs appear with both *meN-* and *di-* prefixes, with the alternatives used to make an argument available for relativisation as in the following examples:

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[6] I assume that, as SUBJ and OBJ are syntactic concepts, syntactic transitivity is the relevant notion for this argument.

23. *Kamu   punya   ibu   yang   menyayangimu.*
     2sg   have   mother   REL   meN.love.APPL.2sg
     'You have a mother who loves you.' (SDM: 84)

24. *Untuk   menemui   anak   yang   begitu   disayanginya.*
     for   meN.meet.APPL   child   REL   so   di.love.APPL.3
     'In order to meet a child who is so loved.' (SDM: 208)

The contrast in syntactic behaviour between the derived transitive verb which does have an OBJ and the emotion predicate is clear.

The possibility that the stimulus is the SUBJ of its clause can also be eliminated for various reasons. Firstly, it would be surprising that an argument alternated between being an OBL and a SUBJ with no verbal morphology. Secondly, it can be seen from example 23 that the experiencer is the SUBJ of the corresponding applicative verb with *meN-* prefix, the clause type which corresponds to an active clause. Applicativization does not affect SUBJs, therefore the experiencer should be the SUBJ of the basic predicate. A clause can only have one SUBJ, therefore the stimulus cannot be one. Finally, Indonesian has a third person pronoun, *ia*, which is restricted (more or less) to appear in SUBJ position. This pronoun can occur as experiencer of an emotion predicate clause:

25. *Ia   kuatir   suratnya   tidak   sampai*
     3sg   fear   letter.3   NEG   arrive
     'She was afraid her letter would not arrive.' (ES: 313)

Once again, the fact that a clause can only have one SUBJ forces the conclusion that the stimulus cannot be SUBJ.

This section has demonstrated that emotion predicates are not transitive verbs in Indonesian. Therefore, a bare NP stimulus argument following such a predicate cannot be an OBJ. And the (remote) possibility that such arguments are SUBJs has also been eliminated.

3. OBL$_\theta$

Having established that a NP stimulus of an emotion predicate cannot be assigned the GFs SUBJ or OBJ, I now turn to examine the arguments as to whether such elements might be classified as OBL$_\theta$. The following pair of examples, which are adjacent in the text in which they occur, suggests that there is no clear semantic difference between the two constructions for speakers:

26. *Papa   sayang   padamu,   Risa.*
     father   love   to.2   Risa
     'Father loves you, Risa'.

27. *Risa   juga   sayang   Papa.*
     Risa   also   love   father
     'Risa loves Father too.' (SDM: 293)

146

Therefore, it might be possible to argue that the stimulus in example 27 and similar clauses is still an OBL$_\theta$, but one with non-standard coding. There are two pieces of evidence which suggest that this would be a wrong conclusion.

Firstly, there is once more a definitional issue. Indonesian is not a case-marking language, and therefore the obvious distinction between core and non-core arguments is the presence of prepositions. This is not a definitive criterion however. The literature includes examples both of NPs with the coding properties of obliques being treated as direct arguments, and of NPs with the coding properties of direct arguments being treated as obliques. Examples of the first type are animate, referential objects in Spanish, which are preceded by the preposition *a* (Hopper & Thompson 1980) and various subjects in Icelandic with 'quirky' case-marking (Zaenen, Maling & Thrainsson 1985). An example of the second type is the use of accusative case in Icelandic to mark some temporal adjuncts (Smith 1996). Such examples show that coding properties alone are not sufficient to establish the syntactic status of an argument. Behavioural tests are necessary also, and I now turn to two such test which show that the stimulus of example 27 and similar clauses does not have the properties of an oblique argument.

The first way in which NP stimuli behave like direct arguments is that a quantifier can be floated from them. This is not possible with a PP stimulus, or a PP which is an adjunct:

28.   *Anak-anak   itu   suka   gula-gula   itu   semuanya.*
         child.RED   that   like   sugar.RED   that   all
         'All the children like the sweets.'   OR

         'The children like all the sweets.'

29.   *Anak-anak   itu   suka   dengan   gula-gula   itu   semuanya*
         child.RED   that   like   with   sugar.RED   that   all
         'All the children like the sweets.'   NOT

         'The children like all the sweets.'

30.   *Orang-orang   Sasak   datang   dengan   anak-anaknya   semuanya*
         man.RED   Sasak   come   with   child.RED.3   all
         'All the Sasak people came with their children.'   NOT

         *'The Sasak people came with all their children.'

In each case, the quantifier can be read as having floated from the SUBJ, and evidence to be presented below will show that other direct arguments also have this property. But only with the NP complement of an emotion verb can the quantifier be read as having floated from the other NP in the clause; when that NP is within a PP the quantifier cannot be construed with it[7].

The second piece of evidence comes from extraction facts. Indonesian subjects can always be extracted leaving a gap and this generalisation is agreed on by all sources. The facts regarding other arguments of transitive verbs are in dispute and will be discussed below. For emotion predicates, I am only aware of one discussion of extraction in the literature,

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[7] One of my consultants allows both readings of example 29, but the second reading seems to be marginal and is strongly rejected by the other consultant.

Stephens (1970), and this source claims that extraction of NP stimuli is grammatical[8]. This judgment is shared by the native speakers I have consulted. Gapped extraction from PPs is completely impossible however[9], neither preposition-stranding nor pied-piping is available in Indonesian. The status of the PP involved, selected or not, is not relevant:

31.　　　*gula-gula*　　*yang*　　*anak-anak*　　*suka*　　*itu*
　　　　　sugar.RED　　REL　　child.RED　　like　　that
　　　　　'the sweets that the children like'

32.　　　**gula-gula*　　*yang*　　*anak-anak*　　*suka*　　*dengan*　　*itu*
　　　　　sugar.RED　　REL　　child.RED　　like　　with　　that

33.　　　**gula-gula*　　*dengan*　　*yang*　　*anak-anak*　　*suka*　　*itu*
　　　　　sugar.RED　　with　　REL　　child.RED　　like　　that

34.　　　**anak-anak yang orang Sasak　datang dengan itu*
　　　　　FOR: 'the children that the Sasak people came with'

Clearly, the behavioural properties of NP stimuli are different from those associated with the grammatical function OBL$_\theta$ in Indonesian. It is not possible to maintain an analysis which treats these constituents as obliques with unusual coding properties. Therefore, it seems that the only possible analysis within LFG's inventory of grammatical functions is to treat the stimuli as OBJ$_\theta$s and I turn to an examination of the evidence for this position in the following section.

Although not part of the main argument being developed here, it is of interest to note that even when stimuli are coded as PPs, in the construction of examples 1 and 2, they have some properties which are not typical of obliques in general. In this construction, for any one predicate various prepositions are possible introducing the second argument:

35.　　　*tak*　　*percaya*　　*akan*　　*diri*　　*sendiri*
　　　　　NEG　　believe　　about　　self　　self.INT
　　　　　'lack self-confidence'　(E&S: 422)

36.　　　*Kau*　　*kira*　　*sekarang*　　*orang*　　*akan*　　*percaya*　　*dengan*
　　　　　2sg　　guess　　now　　man　　FUT　　believe　　with
　　　　　bualmu　　*itu?*
　　　　　boasting.2　　that
　　　　　'Do you think anyone will believe your boasting now?'　(PYD: 200)

37.　　　*Kami*　　*tidak*　　*percaya*　　*kepada*　　*mereka.*
　　　　　1pl.EX　　NEG　　believe　　to　　3pl
　　　　　'We don't believe (in) them.'　(McKay)

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[8] Kana (1986) discusses emotion predicates in some detail (see also below), but does not consider extraction.

[9] Extraction with a resumptive pronoun is possible: see Sneddon (1996) :289-291.

38.　　　*Salahnya,　　dulu　　　saya　　tidak　　percaya　　padamu*
　　　　　mistakenly　formerly　1sg　　NEG　　believe　　to.2
　　　　　'Mistakenly, I did not believe you previously.' (SDM: 168)

This behaviour is seen across the whole group of predicates involved, including those which never occur with a NP stimulus, and there does not appear to be any meaning difference depending on the preposition choice. Two factors do influence the choice of preposition. If the following NP is human, then *kepada* or *pada* is preferred[10]. Register is the other factor which has consistent effects on preposition choice with, for example, *akan* only occurring in formal registers and *sama* (not exemplified here) only occurring in informal registers. These data suggest that in this construction the stimulus is being assigned a semantic role directly by the predicate, with the preposition making no semantic contribution. This behaviour is not typical of true OBL$_\theta$s, which display semantic interdependence with the preposition or case-marker which licenses them.

4. OBJ$_\theta$

As mentioned above, OBJ$_\theta$ is the grammatical function of the second object of ditransitive verbs for LFG. Indonesian has a small number of underived verbs which are ditransitive, and a large number derived with the applicative suffixes -*i* and -*kan*. I will discuss here three properties of the second objects of such verbs: access to SUBJ in a related clause, quantifier float and extraction and compare them with the properties of NP stimuli.

The second object of a ditransitive clause with a *meN-* prefixed verb cannot become subject of a clause with a *di-* prefixed verb:

39.　　　**Surat*　　itu　　　dikirimi　　　　wanita　　itu*
　　　　　letter　　that　　*di*.send.APPL　woman　　that
　　　　　('The letter was sent the woman.) (Chung 1976: ex.63a)

In the case of derived ditransitive verbs such as that in example 39, the same thematic argument would be OBJ in a related clause with an underived, *meN*-prefixed verb and has access to SUBJ position in the related clause with a *di*-prefixed verb:

40.　　　*Surat　　itu　　　dikirim　　kepada　　wanita　　itu*
　　　　　letter　　that　　*di*.send　　to　　　　woman　　that
　　　　　'The letter was sent to the woman.'

The motivation for applicative is to make the third argument available to syntactic processes which require core status; there is no motivation to maintain the status of other arguments. In respect of access to SUBJ, the behaviour of the OBJ$_\theta$s and the NP stimuli is similar. NP stimuli cannot become SUBJ of a related clause either unless ᵗhe verb is morphologically altered. They can become SUBJ of a related clause headed by a *di*-prefixed derived verb (example 24) and the behaviour of the two argument types diverges here. Second objects cannot be SUBJ or OBJ with derived verbs while stimuli can. However, the relevant verbal derivation, applicative, promotes an oblique argument to core status, therefore the source of the applicativised emotion verbs must be the construction

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[10] One consultant reports that this is taught as a prescriptive rule in the Indonesian education system.

with a PP stimulus and the comparison between the two types is not in fact direct on this point[11].

In the previous section, examples were given which showed that a quantifier could float from a SUBJ. This is also possible from OBJs and from OBJ$_\theta$s:

41.   *Saya   mukul   anak-anak   itu   kemarin   semuanya*
           1sg   hit   child.RED   that   yesterday   all
           'I hit all the children yesterday.'

42.   *Saya   memberinya   hadiah   itu   semuanya*
           1sg   *meN*.give   gift   that   all
           'I gave her all the presents.'

The descriptive generalisation is that quantifiers can float from any direct argument in Indonesian. And as previously shown, a quantifier can also float from an NP stimulus (example 28, repeated here):

43.   *Anak-anak   itu   suka   gula-gula   itu   semuanya.*
           child.RED   that   like   sugar.RED   that   all
           'All the children like the sweets.' OR

           'The children like all the sweets.'

In this case, the stimuli behave like direct arguments; they are not SUBJ or OBJ, so OBJ$_\theta$ is the remaining possibility.

Many descriptions of Indonesian state that extraction (relative clause formation and question formation) is only possible with SUBJs. The facts are a good deal more complicated than this as soon as anything other than the prescriptive standard is investigated; a more complete account is given by Voskuil (1996: Ch 8). For the purposes of this discussion, I will assume that all direct arguments can be extracted in the absence of verb affixation[12]. Thus an OBJ can be extracted from a clause of the type seen in example 15 (auxiliary added to disambiguate the construction)[13]:

44.   *buku   yang   dia   akan   baca   itu*
           book   REL   3sg   FUT   read   that
           'the book that she will read'

As for OBJ$_\theta$s, judgments vary. As might be expected, such arguments cannot be extracted when the verb carries a prefix, and no native speaker I have consulted will allow extraction when the verb is derived with an applicative suffix. In the case of underived, unprefixed

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[11] I ignore here the issue of applicative derivations in Indonesian which take a transitive verb and derive another transitive verb with a different meaning e.g. *memergok* 'catch someone by surprise', *memergoki* 'catch someone redhanded'.

[12] The construction seen in example 14 is a special case: despite the lack of a verb affixes, only the SUBJ can be extracted. Musgrave (in preparation) offers a tentative account of why this should be so.

[13] Michael Ewing (p.c.) informs me that he has observed numerous examples of such constructions in recorded conversation of educated Indonesians.

ditransitive verbs, judgments vary. At least some speakers will permit extraction of the second object from clauses of this type:[14]:

45.   *Saya   akan   beri   dia   buku   itu*
              1sg   FUT   give   3sg   book   that
              'I will give him the book.'

46.   *buku   yang   saya   akan   beri   dia   itu*
              book   REL   1sg   FUT   give   3sg   that
              'the book that I will give him'

As demonstrated above (example 31), this type of extraction is also possible with a NP stimuli:

47.   *orang   yang   saya   suka.   itu*
              person   REL   1sg   like   that
              'the person that I like'

On this test, the NP stimulus possesses the syntactic properties of a direct argument more clearly than OBJ$_\theta$s. I have demonstrated that NP stimuli cannot be plausibly assigned any of the other three GFs recognised by LFG, and that their syntactic properties are very similar to those of OBJ$_\theta$s. Within the theory as currently formulated, this would seem to be the only possible analysis. The only alternative is to add a GF to the inventory, and the final section of this paper examines which of these two possibilities is preferable from a theoretical point of view.

5. Theoretical Implications

The data presented in the previous sections show clearly that the NP stimuli associated with emotion predicates in Indonesian are direct arguments of the predicate, but they are not OBJs as usually understood. Previous studies have ignored this issue, or presented unsatisfactory accounts. Stephens (1970) aims only to draw attention to the existence of what he terms a class of 'pseudo-transitive' verbs in Indonesian, and offers no account of the syntax of the clauses in which they occur. Kana (1986: 283-289), working in the Relational Grammar framework, analyses such arguments as initial 3s or Locatives, without appearing to consider these as genuinely different possibilities. The possibility that such arguments are Locatives, presumably a variety of oblique, seems to contradicted by the evidence presented in section 3 of this paper. This analysis must also explain the fact that out of the range of prepositions which are used to introduce the stimuli of emotion verbs, locative prepositions are noticeably absent. In my database, the basic locative preposition *di* never occurs with these predicates. I have two examples using the locative noun *atas* 'top surface' alone; it is normally used in association with *di*. Otherwise, the common prepositions used code movement towards (*pada, kepada*) or accompaniment (*dengan, sama*). Kana's alternative, that the NP stimuli are initial 3s, is essentially the position argued for in this paper.

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[14] This is not true for the verb *ajar* 'teach' for my primary consultant. I have no explanation of this fact.

In classic LFG, as presented in Kaplan and Bresnan (1982), OBJ$_\theta$s are called OBJ-2s and it is explicitly stated that this grammatical function can only be assigned if the function OBJ has already been assigned. Clearly, the analysis argued for above is not possible within this scheme. However, in LFG as currently practised (Bresnan, to appear), it is not clear that the constraint still holds. Grammatical functions are now decomposed into feature bundles and all have equal status from this point of view. The differences in occurrence of the various GFs can be ascribed to the operations of Lexical Mapping Theory (LMT) on the lexical entries of the verbs of a language, rather than being stated as direct constraints on GFs.

Further consideration of LMT suggests both a way of thinking about the properties of Indonesian emotion predicates which makes them seem less strange, and a good reason for preferring the analysis of NP stimuli as OBJ$_\theta$s to the alternative. On the first point, LMT is based on the decomposition of GFs into the features [+/-o(bject)] and [+/-r(estricted)].The predicates in question can have a second argument which is either an OBL$_\theta$ or an OBJ$_\theta$. These form a natural class in LMT, both having the feature [+r]. So the proposed analysis reduces to claiming that this class of predicates lexically specifies that their second argument is [+r]; then some predicates have a second lexical entry with the additional information that they license a second direct argument. The operations of LMT will do the rest of the work, assigning the GF OBL$_\theta$ in the first case and OBJ$_\theta$ in the second case. LMT treats all four GFs as equal in essence, and from this point of view the relative unimportance of the GF OBJ$_\theta$ in the grammars of languages is surprising. The present analysis might be viewed then as adding empirical support to the view of GFs implicit in the LMT.

On the second point, it might be suggested that the evidence presented here justifies proposing a more fine-grained analysis of non-subject arguments in Indonesian than is allowed by LFG. The syntactic properties of NP stimuli and OBJ$_\theta$s are not identical, and the considerable overlap might be due only to the fact that both are types of direct argument. There might be more than three types of non-subject argument in the language. However, the LMT offers a strong theory-internal argument against adopting such an analysis. Two binary-valued features allow exactly the four GFs assumed by the theory. and introducing a new GF would disrupt this aspect of the theory. To do so must mean that the two features used thus far do not exhaust the relevant information, and another feature would be required. This in turn would mean that rather than adding one GF, at least two would have to be added, on the assumption that the new feature would be dependent on one of those already assumed. If the new feature was independent of the existing ones, then four new GFs would be added to the system. To my knowledge, there is no empirical support for reducing the constraints on the theory in this way. In the absence of such evidence, I conclude that it is preferable to retain the current inventory of GFs, and to analyse the NP stimulus associated with an emotion predicate in Indonesian as an OBJ$_\theta$.

A slight change of viewpoint suggests an alternative viewpoint which may be worth exploring. The picture of GFs which most of us are familiar with is very definitely based on the transitive clause - there are SUBJs, OBJs and OBLs and anything else is rather awkward to deal with. The data presented here certainly do not exhaust the complications of GFs in Indonesian (some additional problems are discussed in Arka and Manning (to appear)), and the best picture of Indonesian syntax may in fact be one which sees the major

oppositions as being between SUBJ, other direct arguments and OBLs with OBJ of a transitive clause being the awkward element to deal with. While the arguments presented here are valid for this limited data, a different treatment may be appropriate for more complete data and Musgrave (to appear) aims to provide such a treatment.

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Clefts vs. pseudo-clefts in Austronesian[*]

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1 Introduction

The goal of this paper is two-fold. First, I argue that the cleft in many Austronesian languages is best analyzed as a (kind of) pseudo-cleft.[1] More precisely, clefts are copular constructions with a headless relative in subject position. Second, I show that the special focus interpretation associated with these clefts derives quite simply from the semantics of the headless relative (a definite description). (1) illustrates a typical example from Malagasy, a Western Austronesian language with VOS word order.[2]

(1) [I Sahondra] [no nanapaka   ity hazo ity].
      Sahondra   NO PST.AT.cut   this tree this
    'It was Sahondra who cut this tree.'
    (lit.) 'The one who cut this tree was Sahondra.'

The focussed element, *i Sahondra*, is the matrix (copular) predicate. The clause-final subject is the headless relative *no nanapaka ity hazo ity* 'the one who cut this tree'.[3]

The connection between clefts and pseudo-clefts has a long history in generative linguistics, beginning with observations by Jespersen (1928). Much research in the 60's and 70's explored this connection (e.g. Akmajian (1970); Pinkham and Hankamer (1975)). More recently, Percus (1996) has proposed that cleft sentences in English are derived from a structure with a headless relative in subject position. Whether or not this analysis is correct for English, I will show that their arguments apply very elegantly to the Austronesian data. That clefts are in fact pseudo-clefts in Austronesian is not a new claim. Other researchers have come to the same conclusion about Chamorro (Chung (1998)), Madurese (Davies (2000)), Malay (Cole, Hermon and Aman (to appear) (henceforth CHA)), Maori (Bauer (1991)), Palauan (Georgopoulos (1991)) and

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[1] I am using the term "pseudo-cleft" somewhat liberally here. Since Higgins (1973), pseudo-clefts in English are defined as having a free relative in subject position:

    (i)   What Sahondra did was cut the tree.

In the languages discussed in this paper, the subject is either a headless relative or a free relative. I do not take this difference to be important for present purposes.

[2] Proper names in Malagasy are preceded with a determiner, either *i* or *Ra*. Abbreviations used in this paper:

1-first person	2-second person	3-third person	ACC-accusative
AGR-agreement	AT-Actor Topic	AV-Actor Voice	CT-Circumstantial Topic
DET-determiner	DO-direct object	EQ-equative	EXCL-exclamative particle
FOC-focus	FUT-future	GEN-genitive	L-locative
LNK-linker	NEG-negation	NOM-nominative	NPI-negative polarity item
P-preposition	PASS-passive	PERF-perfective	PL-plural
PST-past	Q-question marker	R-referential	REL-relative marker
SG-singular	T/A-tense/aspect	TOP-topic particle	TT- Theme Topic

Malagasy grapheme to phoneme correspondence is fairly transparent, with one notable (and in this paper, important) exception: *o* is pronounced [u].

[3] Although I argue that the correct analysis of Austronesian "clefts" involves a pseudo-cleft, I will generally translate with cleft sentences. I choose clefts as in English, they are more natural and they bring out the properties I wish to discuss more clearly.

Tagalog (Kroeger (1993); Richards (1998)).[4] What has not been previously noted is the connection between the syntactic structure and interpretation.

This paper does not make any claims about the universality of this analysis of clefts. In fact, both a movement analysis and a pseudo-cleft analysis may be possible (as is argued for English by Pinkham and Hankamer (1975) and for Chamorro by Chung (1998)). This paper, however, only motivates the pseudo-cleft analysis, based on structural and interpretive arguments. In other words, I leave open the possibility that some clefts may indeed be generated via movement.

2 Structure

Since the bulk of the data in the paper are from Malagasy, I give a brief introduction to Malagasy syntax. Malagasy is a Western Austronesian language spoken in Madagascar. The unmarked word order, which is fairly rigid, is VOS, illustrated in (2), where the subject is marked with a dotted underline.

(2) a. Nanapaka ity hazo ity tamin'ny antsy i Sahondra.
   PST.AT.cut this tree this PST.P.GEN.DET knife Sahondra
   'Sahondra cut this tree with the knife.'

   b. Notapahin'i Sahondra tamin'ny antsy ity hazo ity.
   PST.TT.cut.GEN.Sahondra PST.P.GEN.DET knife this tree this
   'This tree was cut by Sahondra with the knife.'

   c. Nanapahan'i Sahondra ity hazo ity ny antsy.
   PST.CT.cut.GEN.Sahondra this tree this DET knife
   'The knife was used by Sahondra to cut the tree.'

(2) also illustrates the basic voice alternations: Actor Topic (AT), Theme Topic (TT) and Circumstantial Topic (CT). Simplifying somewhat, the different voices promote different elements to subject: agents, themes and obliques, respectively. Similar voice paradigms may be found in other Austronesian languages, with varying degrees of complexity.

The core data I will consider in this paper are clefts, as in (1), repeated in (3).

(3) I Sahondra no nanapaka ity hazo ity.
   Sahondra NO PST.AT.cut this tree this
   'It was Sahondra who cut this tree.'

On the surface, (3) involves the "fronting" of the subject, which is followed by a particle *no*. In Malagasy, as in most western Austronesian languages, only subjects and (certain) obliques may be focussed (Keenan (1972)). In order to focus an internal argument, passive is used. This restriction is shown by the contrast between the ungrammatical (4a) and the grammatical (4b).

(4) a. * Ity hazo ity no nanapaka i Sahondra.
   this tree this NO PST.AT.cut Sahondra
   'It was this tree that Sahondra cut.'

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[4] The pseudo-cleft analysis of Malagasy is suggested by Pearson (1996: fn17).

b.   Ity hazo ity   no notapahin'i Sahondra.
          this tree this   NO PST.TT.cut.GEN.Sahondra
          'It was this tree that was cut by Sahondra.'

Adjuncts, however, freely extract, whatever the voice on the verb, AT, TT, or CT.

(5)   a.   Tamin'ny antsy   no nanapaka   ity hazo ity i Sahondra.
               PST.P.GEN.DET knife   NO PST.AT.cut this tree this Sahondra
               'It was with the knife that Sahondra cut this tree.'

      b.   Tamin'ny antsy   no notapahin'i Sahondra   ity hazo ity.
               PST.P.GEN.DET knife   NO PST.TT.cut.GEN.Sahondra   this tree this
               'It was with the knife that this tree was cut by Sahondra.'

      c.   Tamin'ny antsy   no nanapahan'i Sahondra   ity hazo ity.
               PST.P.GEN.DET knife   NO PST.CT.cut.GEN.Sahondra   this tree this
               'It was with the knife that Sahondra cut this tree.'

Note that in (5c), the adjunct is first promoted to subject and then clefted. I will not provide an explicit analysis of the extraction restriction (which applies to all instances of A-bar movement) in this paper (but see section 2.3 for some discussion). Instead, I focus on the structure and interpretation of clefts.
     As already seen above, typical examples of clefts involve NPs and PPs. In certain cases, apparent VP clefts occur.

(6)   Mihinana   akoho   no mitsangana Rasoa.
      AT.eat   chicken   NO AT.stand   Rasoa
      'It's while eating chicken that Rasoa stands.'

In (6), the VP *mihinana akoho* 'eating chicken' acts like a adverbial modifier. The exact categorial status is therefore unclear.
     Similar examples can be found in Chamorro, Madurese, Malay, Maori, Palauan and Tagalog:

(7)   a.   Pära si Jessie pära u-fina'gasi   i kareta   [Chamorro]
               FUT   Jessie FUT AGR-PASS.wash   the car
               'It will be Jessie by whom the car will be washed.'   (Chung 1998)

      b.   Siti se   entar   daq Jakarta.   [Madurese]
               Siti REL   go   to   Jakarta
               'It was Siti who went to Jakarta.'   (Davies 2000)

      c.   Apa yang Ali beli?   [Malay]
               what that Ali buy
               'What did Ali buy?'   (CHA)

      d.   Ko Hone   i kite   i   te taahae.   [Maori]
               EQ John   see   DO the thief
               'It was John who saw the thief.'   (Bauer 1991)

e. Ng-Basilia   a mengaus er tia   el tet.   [Palauan]
    AGR-Basilia   R-weave   P DEM L bag
    'It's Basilia who's weaving this bag.'   (Georgopoulos 1991)

f. Si   Bing ang gumawa   ng sapatos na iyon   [Tagalog]
    NOM   Bing NOM AV.PERF.make GEN shoe   LNK that
    'It was Bing who made those shoes.'   (Kroeger 1993)

In all cases, the focussed element appears clause-initially.

It would be tempting to analyze these data as involving movement to the specifier position of a focus projection.

(8)
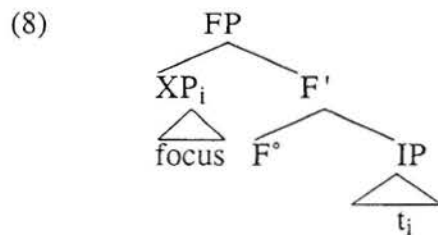
Such approaches have been proposed for focus movement in Hungarian (É. Kiss (1998)) and Italian (Rizzi (1997)). I argue, however, that in all the above languages the "cleft" in is in fact a pseudo-cleft. The basic structure is given in (9). The focussed element is an XP predicate and the presuppositional clause is a headless relative in subject position.[5]

(9) a. I Sahondra no nanapaka   ity hazo ity.
         Sahondra   NO PST.AT.cut   this tree this
         (lit.) 'The one who cut this tree was Sahondra.'

     b.
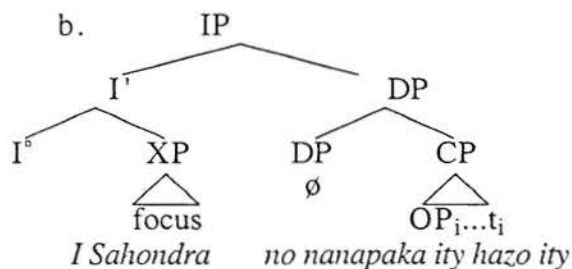
I first show that the focussed element patterns with predicates. I then turn to the presuppositional clause and provide arguments for a headless relative clause in subject position.

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[5] For the purposes of this paper, I assume the simple clause structure in (9), which is based on the analysis of V-initial word order in Guilfoyle, Hung and Travis (1992). Other analyses involve some kind of predicate fronting (e.g. V° or VP movement to a specifier position), but the differences are not crucial to the story presented here. Of the languages discussed, Madurese and Malay are not predicate-initial. Therefore, clefting does involve movement of the predicate to some clause-initial position. I discuss the difference between predicate-initial languages and the SVO languages in section 2.1.

2.1 Focus=predicate

In the above cited languages, the focussed XP does have predicate-like properties. As a first observation, most of these languages are verb-initial. The null hypothesis is therefore that the clause-initial focus is a predicate. There are also language-specific arguments that support this analysis. For example, in Chamorro, the focus can be immediately preceded by a tense/aspect/mood particle (see (7a)). The Palauan example in (7e) shows that the focus takes the subject agreement marker *ng*. Thus in these languages, verbal markers such as agreement and tense associate with the focussed element.

In Malay the interrogative focus particle *kah* provides evidence for the predicate status of focus (Kader (1976)). Simplifying somewhat, *kah* can appear on elements in the predicate, but not on the subject (boldface indicates focus).

(10) a.   Fatimah kata Siti membeli **buku itukah** semalam?
            Fatimah say Siti bought   book   that-Q yesterday
            'Did Fatimah say that Siti bought **that book** yesterday?'   (CHA (40))

      b. * Fatimah kata **Sitikah**   membeli buku itu semalam?
            Fatimah say   Siti-Q   bought   book that yesterday (CHA (41))

If the clefted element is indeed a predicate, we expect *kah* to be able to appear, as the data in (11) show to be the case. Crucially, (11b) is grammatical even though the *wh* word corresponds to the subject of the clause.

(11) a.   **Apakah** yang Ali beli?
            what-Q   that   Ali buy
            'What did Ali buy?'   (CHA (46))

      b.   **Siapakah** yang datang?
            who-Q   that   came
            'Who came?'   (CHA (47))

The grammaticality of *kah* on the clefted word is evidence that the focussed element originates in predicate position, rather than subject position.

Similar data can be found in Madurese (Davies (2000)). The emphatic particle *jhoh* can appear in the predicate, as shown by the examples below.

(12) a.   Ali a-barriq   **jhoh** buku jhuwa   daq Siti!
            Ali AV-give   EMPH book that   to   Siti
            'Ali gave the book to Siti!'

      b.   Ali a-barriq   buku jhuwa   daq Siti **jhoh**!
            Ali AV-give   book that   to   Siti EMPH
            'Ali gave the book to Siti!'

If the emphatic particle appears on the subject, however, the subject must be in the clefted position.

(13) Ali **jhoh** *(se)   a-barriq   buku jhuwa   daq Siti!
       Ali EMPH REL   AV-give   book that   to   Siti
       'Ali is the one who gave the book to Siti!'

Just as in Malay, the clefted element patterns with predicates.

Turning now to Malagasy, most pivots are DPs or PPs, which are also possible as matrix predicates.

(14) a. Any Antananarivo   no mipetraka i Ketaka.
      there Antananarivo   NO AT.live   Ketaka
      'It's in Antananarivo that Ketaka lives.'

    b. Any Antananarivo i Ketaka.
      there Antananarivo Ketaka
      'Ketaka is in Antananarivo.'

(14a) shows a clefted PP and (14b) a PP as a matrix predicate. Consider the parallel DP examples below.[6]

(15) a. Mpianatra no mamaky teny.
      student   NO AT.read word
      'It's students who are reading.'

    b. Mpianatra i Ketaka.
      student   Ketaka
      'Ketaka is a student.'

The data in (14) and (15) show that the elements that occur in the clefted position can function independently as predicates. Moreover, a clefted DP can be negated, unlike argument DPs and like predicates (verbal or other). Thus the pivot in (16a), *Rasoa*, can take negation (marked by *tsy*) and patterns with the nominal predicate in (16d), *mpianatra* 'student'. (16b,c) show that as arguments, DPs cannot be negated.

(16) a. Tsy Rasoa no nanoroka   an-dRakoto.
      NEG Rasoa NO PST.AT.kiss   ACC-Rakoto
      'It's not Rasoa who kissed Rakoto.'

    b. * Nanoroka   tsy   an-dRakoto   Rasoa.
        PST.AT.kiss   NEG   ACC-Rakoto   Rasoa

    c. * Nanoroka   an-dRakoto   tsy   Rasoa.
        PST.AT.kiss   ACC-Rakoto   NEG   Rasoa

---

[6] With DPs, there arises a difference between simple predicates and clefts. Standard DP predicates cannot be definite, while definite DPs can clearly cleft. Hence the examples in (i) below contrast with (15).

  (i) a. Ny mpianatra no mamaky teny.
      det student NO AT.read word
      'It is the students who are reading.'
    b. * Ny mpianatra i Ketaka.
      DET student Ketaka
      'Ketaka is the student.'

This difference clearly requires some explanation. To do so, however, would involve a complete discussion of nominal predication in Malagasy, something I will not undertake in this paper.

d. Tsy mpianatra Rasoa.
   NEG student Rasoa
   'Rasoa is not a student.'

Similarly, the pivot may be preceded by the verbal particle *toa* 'seems'. As shown in (17a), *toa* normally precedes the predicate.[7]

(17) a. Toa nanoroka an-dRakoto Rasoa.
    seem PST.AT.kiss ACC-Rakoto Rasoa
    'Rasoa seems to have kissed Rakoto.'

   b. Toa Rasoa no nanoroka an-dRakoto.
    seem Rasoa NO PST.AT.kiss ACC-Rakoto
    'It seems to be Rasoa who kissed Rakoto.'

The above examples indicate that the pivot has a similar distribution to predicates.[8]

Summing up, a range of data show that the focussed element in a cleft patterns with predicates. I take this as evidence in favour of the structure in (9), where the focus appears in the matrix predicate position. Recall that treating the focus as a predicate is consistent with the predicate-initial word order of these languages. The only exceptions are the Javanic languages, such as Madurese and Malay, which are SVO. In order to account for the SVO languages, I must stipulate that in these cases, focus movement obtains. In other words, the focus element is generated in a predicate position and then moves to the specifier of a functional projection that dominates the subject position. An analysis along these lines is proposed in CHA.

(18)
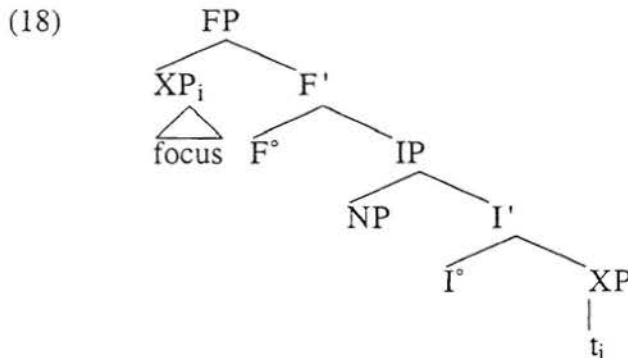
Note that this movement may be due to theme-rheme considerations and is clearly not required in the verb-initial languages.

---

[7] Other adverbs that patterns with *toa* are *tena* 'really' and *tokony* 'should'.

[8] Note that in clefts, there are two potential positions for both *tsy* and *toa*: preceding the focussed element or preceding the embedded verb (with a clear difference in interpretation). Compare (ia) with (16a) and (ib) with (17b).

 (i) a. Rasoa no tsy nanoroka an-dRakoto.
    Rasoa NO NEG PST.AT.kiss ACC-Rakoto
    'It was Rasoa who didn't kiss Rakoto.'
   b. Rasoa no toa nanoroka an-dRakoto.
    Rasoa NO seem PST.AT.kiss ACC-Rakoto
    'It was Rasoa who seemed to kiss Rakoto.'

Hence it is not simply the case that *tsy* and *toa* are clause-initial particles.

2.2 Presuppositional clause=headless relative

Let us now examine the presuppositional clause in more detail. In (9), the presuppositional clause has the structure of a headless relative. The following subsections show that in a wide range of Austronesian languages, the cleft marker is a relative clause marker or another nominal marker.

2.2.1 Malay

The data below illustrate the identity between the relative marker and the cleft marker in Malay.

(19) a.   Siapa **yang** kau nampak?
        who   that   you see
        'Who do you see?'   (CHA (36))

       b.   **Yang** kau nampak Siti (-lah).
           that you see   Siti (foc)
           'The one you see is Siti.'   (CHA (23))

       c.   [DP buku [CP **yang** John beli]]
               book   that   John bought
           'the book that John bought'   (CHA (33))

(19a) is a clefted question, marked by *yang* (glossed as 'that'). (19b) illustrates *yang* as a headless relative marker. That *yang* can be used for regular (headed) relative clauses is shown in (19c). Thus the *yang* in clefts marks the presence of a headless relative in subject position. Davies (2000) cites parallel data from Madurese, which uses the relative/focus marker *se* (see (7b)).

2.2.2 Palauan

In Palauan, the morpheme *a* is an all-purpose DP marker and precedes the presuppositional clause in a cleft. The data in (20) are from Georgopoulos (1991). (20a) illustrates the standard predicate-initial word order while (20b,c) are clefts. Note the presence of *a* in all examples.

(20) a.   [predicate Ng-mekelekolt] [subject **a** ralm].
                AGR-cold   R-water
          'The water is cold.'

       b.   [predicate Ng-Basilia] [subject **a** mengaus er tia el tet].
                AGR-Basilia   R-weave P dem L bag
          'It's Basilia who's weaving this bag.'

       c.   [predicate Ng-te'a] [subject **a** kileld-ii a   sub]?
                AGR-who   R-pf-heat-3s soup
          'Who heated up the soup?'

As described by Georgopoulos, *a* always occurs before a DP (but not before names, pronouns or demonstratives). She concludes that since the presuppositional clause in (20b,c) is marked with *a*, it is a nominal in the subject position.

2.2.3 Tagalog

Richards (1998) cites the following data in favour of a pseudo-cleft structure for Tagalog clefts. He points out that *ang* usually marks nominals in topic position, as in (21a), where *lalaki* 'man' has been topicalized. (Richards calls "topic" what I refer to as the subject position.) Clefts, on the other hand, obligatorily involve *ang* placed immediately before the verb, as illustrated in (21b).

(21) a.   Bumili   ang lalaki ng   tela.
              AT.buy   T   man GEN cloth
              'The man bought cloth.'

      b.   Sino ang bumili   ng   tela.
              who T   AT.buy GEN cloth
              'Who bought cloth?'

The distribution of *ang* is explained if the string of words following the clefted element (*sino* 'who' in (21b)) is a headless relative in topic (subject) position.

2.2.4 Malagasy

The Malagasy "focus marker" *no* is somewhat mysterious by comparison with the above languages as it is not used elsewhere in the language.[9] Hence this type of headless relative does not surface except in clefts. Free relatives in argument positions use *izay*, as illustrated in (22a). Headed relative clauses such as in (22b) are also marked with *izay* (although it is often optional).

(22) a.   Hahazo   karama be   izay   miasa   mafy.
              FUT.AT.get salary big   REL   AT.work hard
              'Whoever works hard will make lots of money.'

      b.   ny vehivavy (izay) miasa   mafy
              DET woman   (REL) AT.work hard
              'the woman who works hard'

Other headless relatives are marked with the determiner *ny*.

(23) ny miasa   mafy
      DET AT.work hard
      'the ones who are working hard' or 'the event of working hard'

I simply stipulate that the headless relative marked by *no* is restricted to certain copular

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[9] Clearly unrelated is the past tense marker *no*. Another use of *no*, likely related to the focus construction is in the first clause of an *if...then* statement, when the second clause expresses a cause.

  (i)   Izaho   no tsy tonga, nisy   raharaha nalehako.
             1SG.NOM NO NEG arrive PST.AT.exist business PST.a.gone.1SG.GEN
             'If I didn't come, it's because business called me elsewhere.'

Finally, *no* appears in certain SVO contexts, where the subject is an indefinite pronoun.

  (ii) Na iza na iza   (no) tsy   mamafa   lalana   dia voasazy.
        or who or who (NO) NEG   AT.sweep   road   TOP voa.punish
        'Whoever doesn't sweep the road will be punished.'

In (ii), *no* is optional and in fact some speakers prefer to omit it. In regular clefts, *no* is obligatorily present.

clauses.[10] Note that the headless relatives in other languages do not seem to have this restriction and may appear in any argument position.

Coordination in Malagasy points toward a DP structure for the presuppositional clause. More precisely, it is evidence against treating the cleft construction as fronting to a specifier position of a functional category in the CP structure (à la Rizzi (1997)). Under such an analysis, the focus constituent moves to the specifier position of [FocusP] and *no* is the head of FocusP or some other projection. The remainder of the clause is simply material in IP. This structure is shown in (24).

(24)   [FocusP Rasoa$_i$ [no [IP nijinja   vary t$_i$]].
         Rasoa   NO   PST.AT.harvest   rice
       'It was Rasoa who was harvesting rice.'

Consider now coordination. Malagasy has two main types of coordinating conjunction: *ary* and *sy*. The former conjoins clauses (IP or CP), while the latter is for smaller constituents, for example VP or DP (or heads).

(25)   a.   Miteny   ny mpampianatra ary mihaino   ny mpianatra.
            AT.speak DET teacher   and AT.listen DET student
            'The teacher speaks and the students listen.'

       b.   Misotro   sy miloka   izy.
            AT.drink   and AT.play 3.NOM
            'He drinks and plays.'

Crucially, *sy* (and not *ary*) is used to coordinate presuppositional clauses.

(26)   Rasoa [no nijinja   vary] sy/*ary [no nanapaka   bozaka].
       Rasoa NO PST.AT.harvest   rice   and   NO PST.AT.cut grass
       'It was Rasoa who harvested rice and cut grass.'

First, the datum in (26) indicates that the string of *no* and whatever follows (i.e. the presuppositional clause) is a constituent. Second, (26) shows that the presuppositional clause is not IP or CP since *ary* is ungrammatical. Thus we have evidence against the analysis briefly sketched in (24).

Due to the similarities between clefts and relative constructions, I will assume that *no* is a nominal marker. The two trees in (27) illustrate two possible structures for the headless relative in question. Under this analysis, *no* is either a determiner, as in (27a), or a complementizer, as in (27b).

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[10] Many other Austronesian languages have a relative marker similar in form to the Malagasy *no* (either *nu* or *anu*). For example, in Sundanese, an Indonesian language, the relative clause marker is *nu* (Hardjadibrata (1985)). It is therefore likely that the Malagasy *no* is a historical remnant. Malzac (1960) mentions that certain Malagasy grammarians believe *no* to be diachronically related to the determiner *ny*. He does not provide any references, however.

(27)   a.

```
              DP
           /      \
          D        NP
          |      /    \
          no   NP      CP
               |      /‾‾‾‾\
               ø      OP...vbl
```

       b.

```
              DP
           /      \
          D        NP
          |      /    \
          ø    NP      CP
               |      /    \
               ø     OP      \
                        C     /‾\
                        |    vbl
                        no
```

Since the precise position of *no* is not crucial to my analysis, I will not attempt to distinguish between these two possibilities (see footnote 10 for some speculation on the category of *no*).

2.3 Headless relatives

In this section, I address certain aspects of the interpretation of the headless relative clause in the proposed structure of the cleft. In a cleft where the pivot corresponds to the subject, the headless relative means something like 'the one/thing who/that...'.

(28)   a.   I Bakoly no manapaka   bozaka.
                Bakoly NO AT.cut   grass
                (lit.) 'The one who is cutting grass is Bakoly.'

       b.   Bozaka   no tapahin'i Bakoly.
                grass   NO TT.cut.GEN.Bakoly
                (lit.) 'The thing that Bakoly is cutting is grass.'

       c.   Ny   antsy no anapahin'i Bakoly   bozaka.
                DET   knife NO CT.cut.GEN.Bakoly grass
                (lit.) 'The thing that Bakoly is cutting grass with is the knife.'

The voice on the verb will determine which argument is interpreted as the external argument. An agent with AT, as in (28a), a theme with TT, as in (28b), or some oblique with CT, as in (28c).

Recall the restrictions on clefting mentioned in section 2. The absence of object clefts is a direct consequence of the headless relative structure proposed. It is not possible to relativize an object, hence the corresponding object cleft is impossible. In other words, the ungrammaticality of the cleft (29a) is related to the ungrammaticality of the relative clause in (29b).

(29)   a.   *   Bozaka no manapaka i Bakoly.
                  grass   NO AT.cut   Bakoly
                  'It's grass that Bakoly is cutting.'

165

b. * ny zavatra izay manapaka i Bakoly
   DET thing REL AT.cut Bakoly
   'the thing that Bakoly is cutting'

c. ny zavatra izay tapahin'i Bakoly
   DET thing REL TT.cut GEN.Bakoly
   'the thing that Bakoly is cutting'

For an object to be relativized, the verb must have TT morphology, as shown in (29c). The same is true for object clefts, as can be seen by the contrast between (28b) and (29a). Thus the restriction on clefting reduces to the restriction on relativization.

Recall, however, that adjuncts can be clefted without being promoted to subject. This is illustrated in (30a), which has a PP pivot and an AT verb. (30b), on the other hand, shows that adjuncts cannot be relativized with AT morphology.

(30) a. Amin'ny antsy no manapaka bozaka i Bakoly.
        P.GEN.DET knife NO AT.cut grass Bakoly
        'It is with a knife that Bakoly is cutting grass.'

     b. * ny antony izay manapaka bozaka i Bakoly
          DET reason REL AT.cut grass Bakoly
          'the reason why Bakoly is cutting grass'

Clearly we cannot simply relate the availabilty of clefts to the grammaticality of relatives. Moreover, in (30a) the headless relative cannot mean 'the one who is cutting grass' for two reasons. First, the agent of cutting (*Bakoly*) is expressed within the relative. Second, if clefts have an equative structure, it is somewhat odd to equate a PP with a nominal referring to an individual.

Before providing an analysis of (30a), I note that these types of adjunct clefts are not common in the Austronesian languages discussed in this paper. CHA explicitly discuss this point with reference to Malay. They point out that the lack of adjunct clefts correlates with certain gaps in the interpretation of headless relatives.

(31) a. ?? Ke mana yang kau pergi?
        to where that you go
        'Where are you going?'

     b. ?? Yang aku pergi (ialah) ke Kuala Lumpur.
        that I go is to Kuala Lumpur
        'Where I am going is to Kuala Lumpur.'

The impossibility of the adjunct cleft in (31a) is related to the impossible meaning for the headless relative in (31b). On the other hand, in the closely related language Madurese, adjunct clefts are grammatical and headless relatives may have the interpretation disallowed in Malay.

To account for the grammaticality of adjunct clefts, I suggest that the headless relative is interpreted as an event nominal (like a gerund). In other words, (30a) means 'The event of Bakoly cutting grass was with a knife'. Invoking the event reading allows a range of obliques to appear in an AT cleft, as is in fact the case. I therefore conclude that these constructions are not strictly equative, but rather copular in a looser sense.

This account may at first appear stipulative. In fact, however, zero nominals in Malagasy freely have either an event or an individual interpretation. Both readings are illustrated in (32).

(32) a.   Faly   ny   manapaka bozaka.
              happy DET   AT.cut   grass
              'The ones who are cutting grass are happy.'

      b.   Sarotra   ny manapaka bozaka.
              difficult   DET AT.cut   grass
              'Cutting grass is difficult.'

      c.   Mihira   ny   tiana.
              AT.sing   DET   TT.love
              'The loved ones are singing.'

      d.   Mahafinaritra ny   tiana.
              AT.happy   DET   TT.love
              'Being loved is pleasant.'

In (32a), the zero nominal clearly receives an individual reading. (32b), on the other hand, is a gerund-like zero nominal. (32c,d) shows that the individual and the gerund readings are possible for passive nominals as well as active ones. It is therefore not unreasonable to suggest the event and the individual readings are also available for the headless relatives in cleft constructions.

    Another possible analysis of adjunct clefts involves movement. For examples such as (30a), the adjunct moves to a clausal focus position, rather than being generated as a predicate. The structure is shown in (33).

(33)   [[Amin'ny antsy]$_i$ no [manapaka bozaka t$_i$ i Bakoly].
           P.GEN.DET knife NO AT.cut   grass   Bakoly
           'It is with a knife that Bakoly is cutting grass.'

A similar dual analysis of clefts is suggested by Pinkham and Hankamer (1975) for English and by Chung (1998) for Chamorro. By invoking movement for adjunct clefts, we can maintain a strictly equative analysis for subject clefts. In other words, by complicating the syntax (two alternate derivations), we simplify the semantics. This solution, however, does not provide any explanation for why clefting of adjuncts is ruled out in certain languages (such as Malay) and not in others (like Madurese). More importantly, a purely syntactic explanation does not capture the correlation between the interpretation of headless relatives and the possibility of adjunct clefts.

2.4 Summary

In this section, I have provided syntactic arguments for analyzing the cleft in a range of Austronesian languages as a copular construction. The focus is in fact the matrix predicate and the presuppositional clause is a headless relative clause in the subject position. The final two sections of this paper investigate the interpretation of clefts and how this interpretation relates to the proposed structure.

3 Interpretation

Turning to the semantics of cleft constructions, it has long been noted that they are associated

with a certain interpretation: existential presupposition and exhaustivity (Halvorsen (1978)).[11] This interpretation is also apparent in Malagasy.

3.1 Existence

First, a cleft (it is x that P) presupposes that there is some individual x that has the property P ($\exists$x s.t. Px is true). Hence the presupposition of the cleft in (34b) is that someone painted houses. This clearly contradicts (34a), which asserts that no one painted houses.

(34) a.   Tsy misy olona   nandoko   trano...
             NEG exist person PST.AT.paint house
             'No one painted houses...'

        b. # ... noho   izany   dia   tsy i Koto no nandoko   trano.
                 because   that   TOP   NEG Koto NO PST.AT.paint house
            '... therefore it wasn't Koto who painted houses.'

A similar conflict arises in (35), which presupposes that someone is painting houses while simultaneously asserting that no one is.

(35) * Tsy na iza na iza   no mandoko trano.
       NEG or who or who NO AT.paint house
   * 'It's no one who is painting houses.'

Just as in English, Malagasy clefts carry existential presuppositions.

3.2 Exhaustivity

Second, a cleft expresses exhaustive identification. É. Kiss (1998) provides tests for the exhaustive reading. Consider first question-answer pairs. The answers in (36b,c) to the question in (36a) have different meanings.

(36) a.   Nandeha   taiza   ianao?
             PST.AT.go PST.where 2SG.NOM
             'Where did you go?'

        b.   Nandeha   tany   Ambositra aho.
             PST.AT.go PST.there Ambositra 1SG.NOM
             'I went to Ambositra.'

        c.   Tany   Ambositra no nandeha   aho.
             PST.there Ambositra NO PST.AT.go 1SG.NOM
             'It was to Ambositra that I went.'

(36b) does not exclude the possibility that I went to other places as well as Ambositra. The cleft construction in (36c), however, is an exhaustive answer; Ambositra is the only destination.

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[11] For this section, I rely mainly on data from Malagasy. Data from Madurese cited in example (40) at the end of this section suggest that the interpretive effects that I identify are common to clefts in other languages.

Similarly, consider the following pairs.[12]

(37) a. Novidin'i Bakoly   ny satroka sy   ny kiraro.
          PST.TT.buy.GEN.Bakoly   DET hat   and DET shoe
          'Bakoly bought a hat and shoes.'

      b. Novidin'i Bakoly   ny satroka.
          PST.TT.buy.GEN.Bakoly   DET hat
          'Bakoly bought a hat.'

(38) a. Ny satroka sy ny kiraro   no novidin'i Bakoly.
          DET hat   and DET shoe   NO PST.TT.buy.GEN.Bakoly
          'It's a hat and shoes that Bakoly bought.'

      b. Ny satroka no novidin'i Bakoly.
          DET hat   NO PST.AT.buy.GEN.Bakoly
          'It's a hat that Bakoly bought.'

As in the English equivalents, the sentence in (37b) is a logical consequence of the one in (37a). On the other hand, (38b) is not a logical consequence of (38a). In fact, (38b) contradicts (38a). Hence, the cleft construction in (38) passes the test of exhaustivity.

Exhaustivity is further illustrated with the following test. Due to the assertion of exhaustivity, there are certain distributional restrictions on the elements that can appear in the focus position.

(39) a. * Bakoly koa no   nandeha   tany   Ambositra.
             Bakoly also NO   PST.AT.go PST.there Ambositra
          * 'It was also Bakoly who went to Ambositra.'

      b. * Na ny   mpianatra votsavotsa aza   no nahazo   isa   tsara.
             or DET   student   weak   even   NO PST.AT.get number good
          * 'It was even the weak students who got good grades.'

      c. * Na iza na iza   no mahavita izany.
             or who or who NO AT.done that
          * 'It's anyone who can do that.'

These elements appear to have some semantic clash with exhaustive identification. For example, the import of *koa* 'also' in (39a) is to assert that going to Ambositra is true of some other individual as well as Bakoly. Hence the meaning of this adverb conflicts with the assertion of exhaustivity, which leads to the ungrammaticality of (39a). Since DPs with these semantic features are not permitted in a cleft, we see that the cleft position is associated with a particular interpretation, in this case exhaustivity.

Although most of the information I have on other Austronesian clefts does not discuss these interpretational facts, Davies (2000) provides similar data from Madurese. He shows that the clefted position is incompatible with the adverb *ghia* 'too, also'.

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[12] É. Kiss attributes this test to Szabolcsi (1981). The judgements in (37) do not change if the verb is in AT. I use TT in (37) to provide minimal pairs with (38), where TT is necessary to allow clefting of the logical object.

(40)　a.　　Marlena nge-cet　roma-na　ghia.
　　　　　　Marlena AV-paint　house-DEF too
　　　　　　'Marlena painted the house too.'

　　b.　　Marlena ghia　nge-cet　　roma-na.
　　　　　　Marlena too　AV-paint　house-DEF
　　　　　　'Marlena also painted the house.'

　　c. *　Marlena ghia　se　　nge-cet　roma-na.
　　　　　　Marlena too　REL　　AV-paint　house-DEF
　　　　　　'Marlena also is the one who painted the house.'

The data in the section have shown that Malagasy clefts are associated with a certain interpretation, parallel to English clefts. Clefts carry two presuppositions: existence and exhaustivity. I now explain why these two presuppositions are present, drawing on the structure of clefts proposed in section 2. In other words, I link the interpretation to the underlying presence of a definite description.

4 Solution

I account for the particular focus interpretation of clefts by invoking the headless relative structure. Recall the structure proposed for clefts in Austronesian.

(41)　a.　　I Sahondra no nanapaka　　ity hazo ity.
　　　　　　Sahondra　NO PST.AT.cut　　this tree this
　　　　　　(lit.) 'The one who cut this tree was Sahondra.'

　　b.
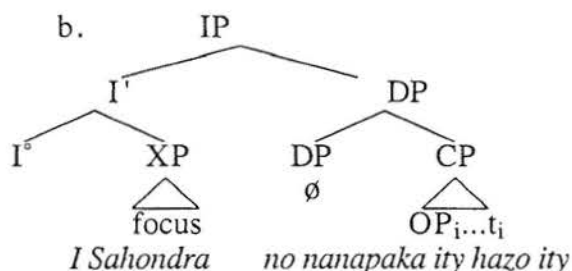
Crucially, the subject DP is a headless relative ('the one who...'). Headless relatives are definite descriptions and therefore have the same presuppositions as definite descriptions. These are precisely the same presuppositions as those exhibited by clefts.

It is well known that definite descriptions presuppose the existence of the individual described. Moreover, definite descriptions presuppose (or entail) that there is exactly one referent as described (Strawson (1950)). In other words, the pattern identified in the previous section is paralleled by (42)-(43) below, which contain overt definite descriptions. Compare the ungrammaticality of (35) (repeated as (42a)) with (42b). In (42b), the definite description 'the one who is painting houses' presupposes the existence of someone painting houses. If this description is predicated of 'no one', ungrammaticality results.

(42)　a. *　Tsy na iza na iza　　no mandoko trano.
　　　　　　NEG or who or who NO AT.paint　house
　　　 *　'It's no one who is painting houses.'

b. * Tsy na iza na iza   ny (olona)   mandoko   trano.
    NEG or who or who   DET (person)   AT.paint   house
  * 'The one who is painting houses is no one.'

Similarly, compare (43a) with (43b). The adverb *koa* 'also' is incompatible with the uniqueness reading that arises in a definite description in (43b) and with the exhaustivity of the cleft in (43a).

(43)   a. * Rasoa koa no   mandoko   trano
        Rasoa also NO AT.paint   house
     * 'It's also Rasoa who is painting houses.'

    b. * Rasoa koa ny   (olona)   mandoko   trano.
        Rasoa also DET (person)   AT.paint   house
     * 'The one who is painting houses is also Rasoa.'

If we analyze clefts as containing a definite description, these parallels in interpretation are accounted for in a simple manner.

5   Conclusion

In this paper, I have proposed a structure for clefts where the focussed element is the matrix predicate and the presuppositional clause corresponds to a headless relative in subject position. I have argued that this analysis of Austronesian clefts accounts both for their structural properties and their interpretation. The focussed element patterns with predicates and the presuppositional clause patterns with complex DP subjects. It is the headless relative, a definite description, that induces the focus interpretation associated with clefts. Note that the headless relative structure proposed is quite common in the languages discussed. In other words, the Austronesian languages under consideration allow productive zero nominal formation, consisting of the simple addition of a determiner or other nominal marker to a predicate. Thus the present analysis of clefts meshes with the syntactic structure of Austronesian languages and is not dependent on special focus features in the syntax or movement to particular focus projections. Instead, the focus reading arises independently and with minimal additional assumptions.

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A Non-Linear Analysis of Vowel Harmony and Vowel Harmony Blocking in Pendau

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1. INTRODUCTION

Vowel harmony is without a doubt the most interesting phonological feature in Pendau (and is found in many if not all of the languages in the Western Austronesian Tomini-Totoli language group, northern Central Sulawesi, Indonesia).[1] Vowel harmony in Pendau is a type of prosodic alignment where certain features of one vowel in the stem spreads to certain prefixes (it can spread in up to three prefixes from right to left) and one infix. The /o/ vowel of a prefix may front to either /a/ or /e/ depending on the features of the first vowel of the root or stem.[2]

Kenstowicz (1994:347) provides a definition for vowel harmony (carefully distinguishing it from umlaut and other similar processes):

> Vowel harmony is a phonological state in which the vowels in a given domain share or harmonize for a particular feature. It differs from other processes affecting adjacent vowels (e.g., umlaut) in that typically all of the vowels of the language participate in the harmonic constraint. In addition, the harmony applies in an essentially unbounded fashion, affecting all the relevant vowels within the domain (typically the word). Virtually any of the common features used to distinguish among vowels have been discovered to seat a harmonic system, including vowel height, backness, rounding, nasality, and pharyngeal opening or [ATR]. Vowel harmony exhibits many of the "action-at-a-distance" properties displayed by tone.

This paper begins by introducing the Pendau data which will give representative examples of vowel harmony for each of the harmonic prefixes. After this the analysis will begin with a brief classical generative analysis of the vowel harmony phenomena showing that the features back and rounding can be collapsed into one rule, but that this rule and this approach to the data is unsatisfactory (especially with the harmony blocking environments). The major part of the presentation utilizes autosegmental, feature geometry, and lexical phonology theories to describe both the vowel harmony process and the environment in which vowel harmony is blocked. Although initially it appears that vowel harmony is blocked by the sequence of two consonants there is data that also shows vowel harmony spreading past two consonants (such as *sa-n-tanga* 'half'). This analysis resolves this by showing that nasal assimilation and nasal deletion block vowel harmony from spreading at the cavity tier. Since the Well Formedness Condition (WFC) asserts that lines cannot be crossed, then by replacing the BR feature with the oral node this vowel harmony problem is resolved elegantly. Finally this paper will briefly put Pendau into a context with other Austronesian languages which have vowel harmony, concluding with the suggestion that vowel harmony can help understand some historical problems in Sulawesi languages.

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[1] This analysis has directly or indirectly benfitted from discussions over the years with: Avery Andrews, René van den Berg, John Bowden, Donald Burquest, Mike Cahill, Timothy Friberg, Chaz Mortensen, Steve Parker, Rebecca Quick. Part of this paper was originally presented in the RSPAS linguistics seminar series in 1996 with a similar title, and I also want to thank that seminar's participants for comments and feedback. Abbreviations: AV active voice, DIR directional, CAUS causative, DISTR distributive aspect, HPS harmonic prefix set, IR irrealis, IV inverse voice, NV non-volitional, ONE numeral one prefix, POSS possessive, RE realis, RSLTV resultative ST stative, STEM stem former, TZ transitivizer.

[2] See Topping 1968 and Latta 1972 for discussion of vowel fronting harmony in Chamorro which is the reverse of this, that is the first vowel of the root or stem fronts to the vowel of the preceding prefix.

2. VOWEL HARMONY DATA

A list of the harmonic prefixes (with the underlying formatives) is provided in (1).

(1) **Harmonic Prefix Set (HPS)**

mong-	AV/IR	ro-	IV/IR
nong-	AV/RE	mo$_1$-	ST/IR
pong-	STEM	no$_1$-	ST/RE
song-	ONE (verb)	so-	ONE (non-verbs)
'o-	RSLTV or POSS	po-	ST/CAUS
-ong-	DISTR		

Most of the harmonic prefixes are verbal prefixes (note that there are other verbal prefixes which are not harmonic, e.g. *me-/pe-* dynamic verb class, *mo-/no-* denominal verb class, etc.). The *so-* prefix is a numeral prefix used on classifiers and measure nouns. The *'o-* prefix is used to possess a noun or in combination with other verbal prefixes (see Quick in prep. for more details). In addition to the harmonic prefixes, there is also one harmonic infix *–ong-* which marks distributive plurality (since most of the harmonic affixes are prefixes, I will include the infix under the label *Harmonic Prefix Set*).

Example (2) shows vowel harmony prefixes with numerals, classifiers, measure nouns, nominalized classifiers, stative verbs, stative intensification (in some cases the vowel harmony prefix is in combination with other affixes).

(2) **Numerals:**

soung	'one'	sa-gatus	'one hundred'
so-mpulu	'one ten'	se-ribu	'one thousand'

Stative Verbs (*mo-* stative irrealis prefix):

ma-pangkat	'tall'	me-empeng	'short'
me-ide	'small'	mo-onda'	'hot'
mo-oge	'large'	me-menyong	'cold'
me-itong	'black'	ma-paris	'difficult'
me-meas	'white'	ma-lamor	'easy'
mo-doda	'red'	mo-mbosi'	good
mo-bulung	'green, blue'	mo-boat	'heavy'
me-riri	'yellow'	ma-nggaang	'light'
ma-dantang	'long'		

Stative Intensification ('o- σ$_c$-):

'a-sa-sanang	'to be exuberent'	sanang	'happy'
'a-pa-pangkat	'to be the most high'	pangkat	'tall'
'o-to-tou'	'the end of it all'	tou'	'finish'
'a-ga-garang	'the most loved'	garang	'love'
'e-de-dea	'uncountable'	dea	'many'
'a-ga-gau'-ong	'have the most deeds'	gau'	'event, activity'

Classifiers:

sa-lai	'one thread-like, hair-like object'
sa-mata	'one eye, one sharp-pointed object'
se-mpe'a	'one flat hard object'
sa-ngkayu	'one snake-like item, tubular'
so-ngkolo	'one cut or shaped heavy object'
so-bua	'one fruit-like object (larger)'
se-ilas	'one ring-like object'
sa-dampe	'one seed-like object'
sa-nta'u	'one fruit (durian, coconuts, etc.), or 4-legged animals'

Nominalized (Quantified) Classifiers:

pe-sa-mata-ong	'one each of a sharp-pointed type object'
pe-so-bua-ong	'one each of a fruit-like object'
pe-se-ilas-ong	'one each of a ring-like object'

Measure Nouns:

se-insang	'one time'	sa-pariama	'one year'
so-ndoung	'one evening'	so-m-bulang	'one month'
se-mbengi	'one night'	se-liter	'one liter'
se-eleo	'one sun, one day'	sa-paak	'one pack'
se-minggu	'one week'	sa-rabo'	'one handful'
so-bungkus	'one package'	se-kilo	'one kilogram/kilometer'

Infixes are given in example (3) below and the infix is shown within brackets. The distributive -ong- infix occurs immediately after the first consonant of the word (this is in contrast with the telic aspectual infix -um- which is inserted after the first consonant of the root).

(3) **Distributive Infix –ong-**

Infixation	**Root**	**Gloss**
n[ong]o-po-duling=omo	duling	'lie down'
n[eng]e-teule=mo	teule	'return home'
m[ong]ong-komung	'omung	'bring, carry'
m[eng]eng-inum	inum	'drink'
m[eng]e-lolo	lolo	'search
n[eng]e-lampa	lampa	'walk, travel'

What is most revealing is a comparison of the Inverse Voice Irrealis prefix (IV/IR) with the Active Voice prefixes (AV/IR or AV/RE). For our purposes here I will only provide the Irrealis form of the Active Voice since the Realis prefix performs exactly the same way as the Irrealis form. Compare the three sets in (4).[3] In (4a) the roots have vowel initial roots, and in (4b) the roots have voiceless consonant initial roots, and in (4c) the roots have (mostly) voiced consonant initial roots. The prefix ro- (IV/IR) is subject to vowel harmony in all instances, whereas the prefix mong- (AV/IR) only undergoes vowel harmony when it occurs with a vowel initial root.

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[3] Also see Rubino in prep. for using these three sets as a phonological exercise.

	IV/IR	AV/IR	Root	Gloss	
(4a)	raabut	mangabut	abut	'weed'	**vowel**
	raangka	mangangka	angka	'steal'	**initial roots**
	reinung	menginung	inung	'drink'	
	reibi'	mengibi'	ibi'	'choose'	
	rouras	monguras	uras	'sow'	
	rooyot	mongoyot	oyot	'haul, pack'	
	roulisi	mongulisi	ulisi	'peel fruit'	
(4b)	ratabola	monabola	tabola	'throw away'	**vl. consonant**
	rasambale	monyambale	sambale	'butcher'	**initial roots**
	raparesa	momaresa	paresa	'check	
	retimbang	monimbang	timbang	'weigh'	
	reketik	mongetik	ketik	'type'	
	rapake	momake	pake	'use, wear'	
	rotuda	monuda	tuda	'plant'	
	rotulis	monulis	tulis	'write'	
	rototo'	monoto'	toto'	'cut, slash'	
(4c)	rasabang	monsabang	sabang	'help'	**vd. consonant**
	ragane	monggane	gane	'pray'	**initial roots**
	rajaong	monjaong	jaong	'sew'	
	regegeri	monggegeri	geger	'file s.t., rub'	
	rabalia'	mombalia'	bali	'move '	
	rabasa	mombasa	basa	'read'	
	rosole	monsole	sole	'fry'	
	rodudul	mondudul	dudul	'light fire'	

Two possible ways of analyzing this blocking are apparent: that it is blocked by underlying consonant sequences, or that it is blocked by the assimilatory processes that also occur in (4b)-(4c) In §6 I will argue for an assimilation blocking account.

3. THE CLASSICAL GENERATIVE APPROACH

This section begins the description of vowel harmony in Pendau by using the classical generative model. This approach is instructive in demonstrating precisely what the harmonic prosody is and also shows the inherent weakness of a linear treatment of vowel harmony.

If the first vowel in a stem is /a/ then the /o/ is fronted to the same features as /a/, that is [-rd]. The features [-hi, +bk] are redundant and implied in the remainder of the rule. The following rule (5) could be formulated (ignoring the more complicated environments for the time being).

(5)

$$V \rightarrow V \quad / \# C \underline{\quad} (C) + V$$
$$\begin{bmatrix} +rd \\ -hi \end{bmatrix} \quad [-rd] \qquad\qquad\qquad [-rd]$$

The generative rule can be translated like this: A mid back vowel becomes unrounded when it is in a(n) (open or closed prefix) syllable preceding a contiguous morpheme whose (first) vowel is unrounded.

When the first vowel in a stem is /e/ or /i/ then the /o/ is fronted to the same features as /e,i/ that is [-bk]. Here the important redundant features are [-hi,-rd], as shown in (6).

(6)

$$V \rightarrow V \ / \# C \underline{\quad} (C) + V$$
$$\begin{bmatrix} +rd \\ -hi \end{bmatrix} \quad [-bk] \quad\quad\quad\quad\quad [-bk]$$

The two rules above shows that in Pendau the vowel harmony agrees in unrounding[4] and backing of [-hi] vowels. When a word has the high back vowel [u] in the initial position no rules are needed since [o] and [u] agree in backness. To capture this natural process we can collapse the two rules above into the rule in (7). In addition we will add the important condition that consonant sequences block the vowel harmony, as there does not seem a convenient way to notate that only one consonant is allowable at a time for vowel harmony to occur. Further it should be noted that the vowel in the stem closest to the prefix is the vowel to which the prefix vowel harmonizes. The specific prefixes are abbreviated as the Harmonic Prefix Set (HPS) as there are other prefixes which do not allow vowel harmony. The word initial boundary is not identified as there are cases where vowel harmony may spread iteratively up to three prefixes.

(7)

$$V \rightarrow V \ / \ C \underline{\quad} (C) \quad\quad + \quad (C) \quad V$$
$$\begin{bmatrix} +rd \\ -hi \end{bmatrix} \begin{bmatrix} -rd \\ \alpha bk \end{bmatrix} \quad\quad\quad\quad\quad\quad \begin{bmatrix} -rd \\ \alpha bk \end{bmatrix}$$
$$\text{[+HPS]} \quad\quad\quad \text{Word Stem}$$

Harmonic Prefix Set (HPS); Condition: A consonant sequence will block the rule.

4. FEATURE GEOMETRY AND VOWEL UNDERSPECIFICATION

The feature geometry in this analysis will follow the general consensus as presented in Kenstowicz (1994). The description of Pendau phonology is enhanced by understanding the theoretical model of feature geometry. Feature geometry models a close relationship between phonology and phonetics. The basic model of feature geometry is given in figure 1 below.

The vowels in Pendau can be underspecified as displayed in figure 2. Since a vowel chart can be displayed in several possible ways, the fact that the /o/ is the underlying vowel in vowel harmony and is used in epenthesis was a determing factor in developing this particular underspecification configuration (originally suggested to me by Steve Parker personal communication).

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[4] I am indebted to Tim Friberg for pointing out to me the unrounding process in an early analysis.

[round] ——————— Labial
[anterior]
[distribute] ————→ Coronal ——→ Oral   [lateral]
[back]   [strident]
[high] ——————→ Dorsal   [continuant]
[low]
[nasal] ——————— Soft Palate ----- Nasal ——————— [consonant]
[ATR]   [sonorant]
[RTR] ——————→ Radical
                                    Pharyngeal
[spread glottis]
[constr glottis] ————→ Laryngeal
[voiced]

terminal features   articulator   cavity   stricture   root
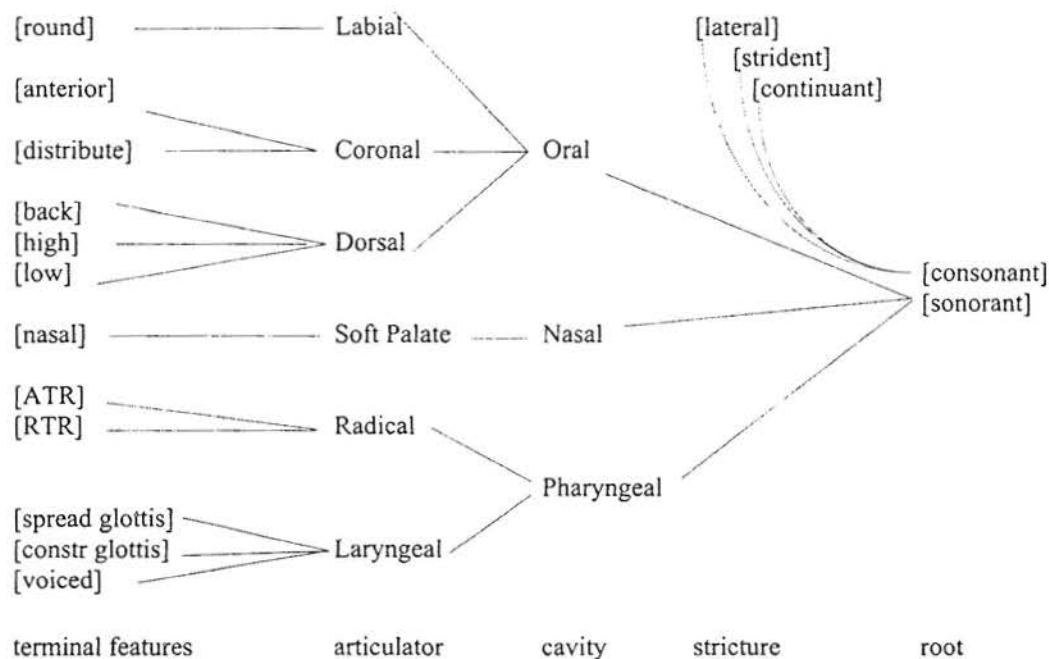
Figure 1. Feature Geometry
(Adapted from Kenstowicz 1994:146; but compare to 1994:452)

	i	e	a	o	u
high	+				+
low			+		
back	-	-			

Figure 2. Vowel Underspecification in Pendau

Listed below are the redundancy rules for Pendau vowels. The post-lexical complement rules derive the /o/ in epenthesis. These also apply to the underlying /o/ when vowel harmony is blocked (see §6).

(8)   Lexical Rules   Post-Lexical Complement Rules

            [-back] ——→ [-rd]   ∅ ——→ [-high]
            [+low] ——→ [-rd]   ∅ ——→ [+back]
                                       ∅ ——→ [-low]

5. AN AUTOSEGMENTAL ANALYSIS OF VOWEL HARMONY IN PENDAU

Vowel harmony in Pendau is a type of prosodic alignment where certain features of one vowel in the stem spreads to vowels in some prefixes. Vowel harmony has been found to operate in much the same manner as tone cross-linguistically. The Autosegmental Theory can be applied in the analysis of Vowel Harmony and is more revealing and elegant than the Classical Generative approach. Autosegmental theory assumes that there is more than one tier and that each tier may operate independently of the other. The theory assumes a set of universal Well Formedness Conditions and each specific language may have its own specific conditions in addition.

5.1 Pendau Vowel Harmony Data and Analysis (Lexical [Level 2])

In Pendau the harmonizing feature is back-round harmony. There are several competing views about the location of the consonant node and the vocalic node. Quoting Kenstowicz (1994:473):

> In the Clements model, the Vocalic node branches into V-Pl and Aperture. This groups vocalic rounding and backness together and isolates height -- a natural acoustic parsing since height is primarily reflected in the first formant and backness and rounding in the second formant. On the other hand, the articulator-based Halle-Sagey model groups backness and height as Dorsal dependents and isolates rounding as a Labial dependent. Odden (1991) discusses a number of cases that appear to support the former partitioning.

Vowel harmony in Pendau may contribute to an understanding of this current issue, as we will see shortly. Clements and Hume (1995:227) further states that back and rounding features can be eliminated in their model:

> A further innovation of this model is that the features [labial], [coronal], and [dorsal], occuring under the V-place node in vocoids, are sufficient, by themselves, to distinguish place of articulation in vowels, and replace the traditional features [back] and [round]. In order to fulfill this new and expanded role in the theory, they must be redefined in terms of constrictions rather than articulator movements as such.

For this analysis I will begin by using BR as a useful heuristic to initially demonstrate that each word stem or word base carries the preassociated feature of the back-round node (BR).[5] Accordingly the following steps would be followed to harmonize the vowel, see example (9) below. First in (9a) the correct preassociation with the Vowel Harmony Tier is drawn. Secondly, since vowel harmony spreads from the root or stem to the prefix the association spreads from right to left (see 9b).

(9)   a.
         [BR]   b.
         | [BR]
         | |

    r o + a l a p   r o + a l a p ⟶ ra-alap
                                                   IV/IR-take
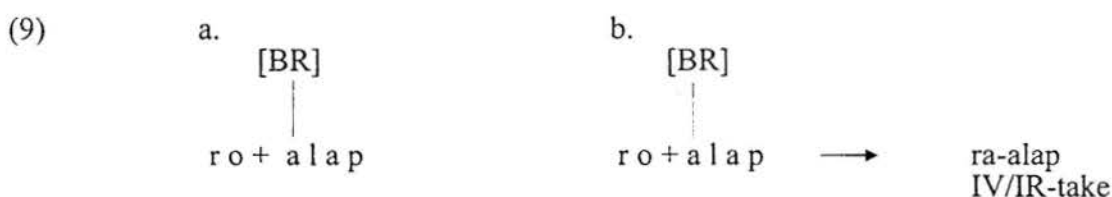
The rules for associating the vowel harmony spreading in Pendau can be stated in these three steps:

Step one   Every root/stem has [BR] as a preassociated feature which is associated to the first vowel of the stem/root.

Step two   If nasal assimilation or glottal assimilation takes place, then vowel harmony is blocked (vowel harmony is blocked in assimilation processes due to the Well Formedness Condition that association lines do not cross, see discussion in §6).

Step three   Prosodic vowel alignment spreads from right to left, so an association line is attached to the vowel(s) of the prefixes. This occurs in level two of the lexical module, and since level two is cyclic, the vowel alignment spreads consecutively to harmonic prefixes to its left.

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[5] Odden 1991 describes back-round as a formal part of vowel geometry.

When the preassociated vowel harmony tier already has the same BR value, as in (10), there is no change (notice that the BR restricts the vowel from harmonizing with [+high]).

(10)

$$[BR]$$

m o ng + u n d u r $\longrightarrow$ mong-undur
AV/IR-sing
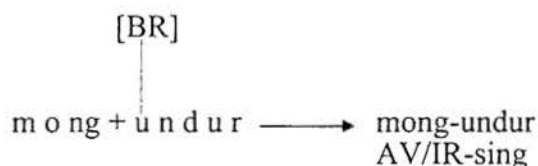
Example (11) shows the BR unrounding the *o* to become a low *a*, in effect fronting it.

(11)

$$[BR]$$

m o ng +a b u t $\longrightarrow$ mang-abut
AV/IR-weed
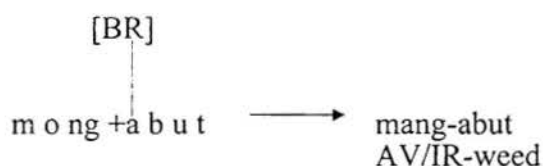
Example (12) further illustrate the process where the back rounded vowel becomes a front vowel.

(12)

$$[BR]$$

r o + r e k e n $\longrightarrow$ re-reken
IV/IR-count

Example (13) illustrates that despite mixed vowels in the root the primacy must be on the first vowel of the stem or root base in deciding which vowel has the preassociation, or last prefix to undergo vowel harmony where there are multiple harmonic prefixes.

(13)

$$[BR]$$

r o + p i y o r $\longrightarrow$ re-piyor
IV/IR-twist
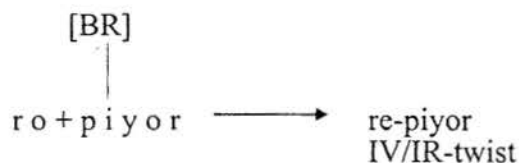
Pendau has several types of derivational prefixes which attach and become the stem of the word as far as vowel harmony is concerned. The vowel in this prefix becomes the vowel to preassociate the features for the vowel harmony/alignment tier.

(14)

$$[BR]$$

r o + p e + g u r u + i $\longrightarrow$ re-pe-guru-i
IV/IR-STEM-learn-DIR
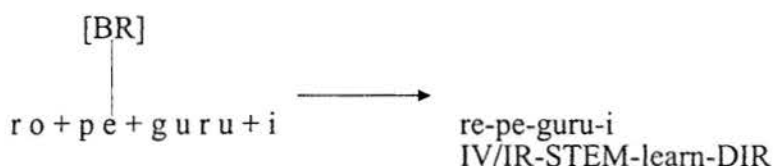
Examples (15)-(16) demonstrates that vowel harmony predictably spreads to more than one possible prefix. Example (15) shows harmony of two prefixes, and example (16) shows harmony spreading into three prefixes. The language specific spreading from right to left still holds true for a more complicated affix situation. Examples (15)-(16) demonstrates how vowel harmony applies iteratively as each affix applies vowel harmony in its turn.

(15)

a.   [BR]

    r o + ' o + t e + l u a r + a '

b.   [BR]

    r o + ' e + t e + l u a r + a '

c.   [BR]

    r e + ' e + t e + l u a r + a ' ⟶ re-'e-te-luar-a'
                                         IV/IR-RSLTV-NV-happy-TZ

(16)

a.   [BR]

    no + po + 'o + t a r o b'

b.   [BR]

    no+po+'a +t a r o b

c.   [BR]

    no+pa+'a +   t a r o b

d.   [BR]

    na +pa+ 'a+t a r o b ⟶ na-pa-'a-tarob
                                         ST/RE-CAUS-RSLTV-rip
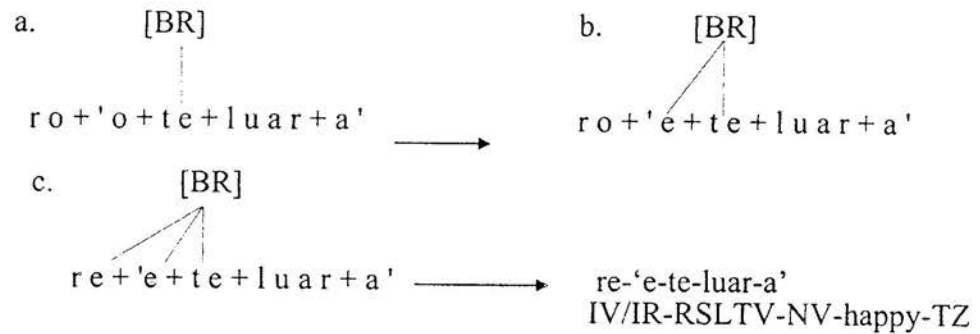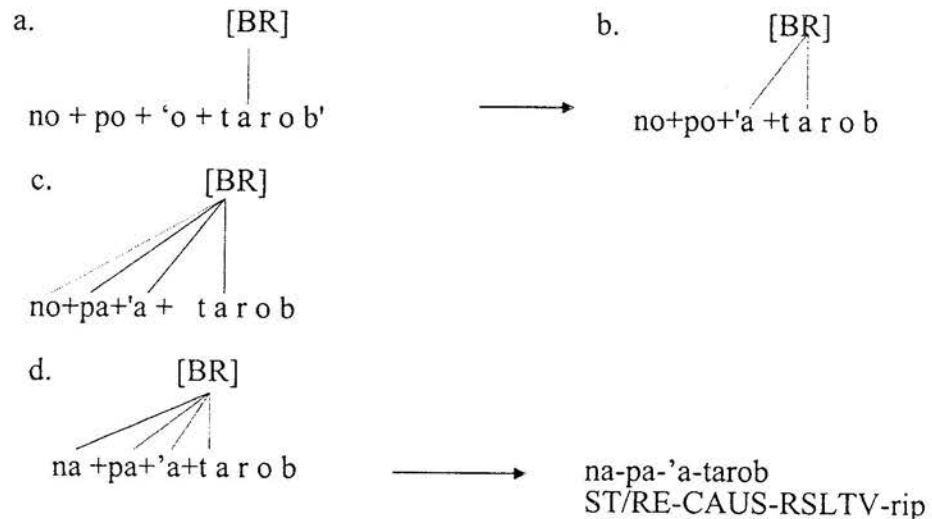
6. ASSIMILATORY PROCESSES THAT BLOCK VOWEL HARMONY

6.1 Nasal Assimilation (Lexical [Level 1 and 2]) and Voiceless Consonant Deletion (p, t, k, s) (Lexical [Level 2])

In Pendau, as in many other Austronesian languages the final nasal assimilates to a point of articulation homorganic with the initial consonant of the stem/root to which it is attached. Example (17) illustrates nasal assimilation to the following voiced obstruent (the affricate [dʒ] assimilates the nasal to the same point of articulation as the voiced coronal obstruent [d] below, e.g. *ponjaong* 'the sewing place').

(17) *nasal assimilation before voiced stops*

Labial   Coronal   Dorsal
|
Oral   Oral   Oral
|
ŋ + b   ŋ + d   ŋ + g
|
SP   SP   SP
|
[+nas]   [+nas]   [+nas]

[m] [b]   [n] [d]   [ŋ] [g]
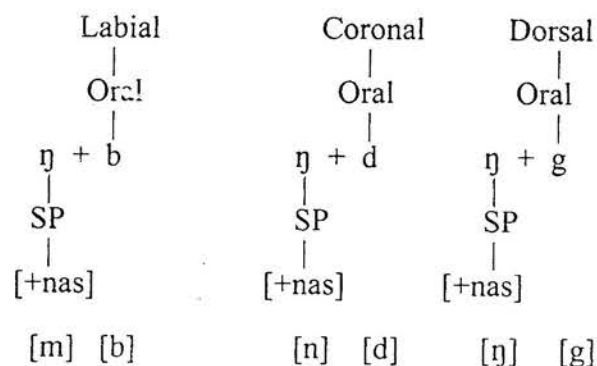
In example (18) it is assumed that voiceless obstruents are deleted because of

underspecification of voicing (or possibly due to some other spreading motivation which isn't specifically germane to the vowel harmony topic).

(18) *nasal assimilation before voiceless obstruents*[6]

labial	coronal	dorsal	coronal
|	|	|	|
oral	oral	oral	oral
|	|	|	|
ŋ + p	ŋ + t	ŋ + k	ŋ + s
|	|	|	|
SP	SP	SP	SP
|	|	|	|
[+nas]	[+nas]	[+nas]	[+nas]

vl. obstr. deletion   Ø   Ø   Ø   Ø
                     [m]   [n]   [ŋ]   [ɲ]
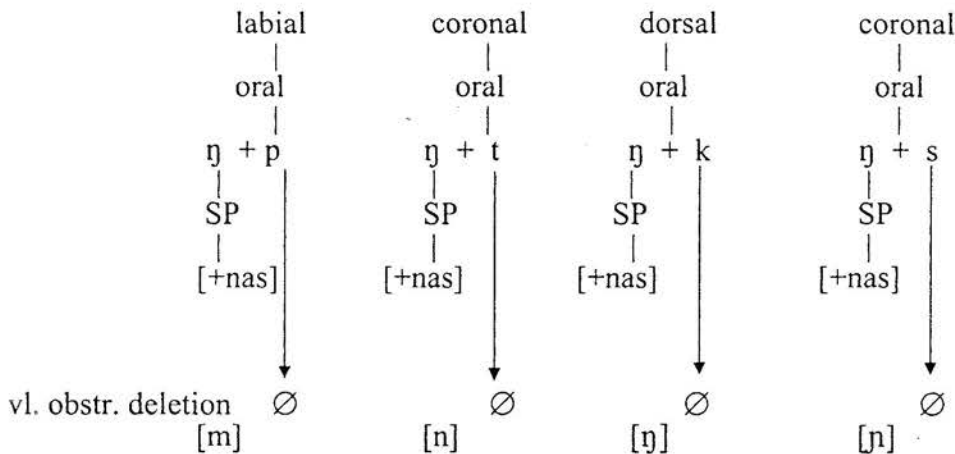
Classifiers and some measure nouns are other word classes prefixed by the harmonic prefix *so-* 'one'. Many classifiers and measure nouns have a problematic nasal that occurs before an obstruent on some words (see (18) for some examples). There are two possibilities for the source of this nasal. One is that the nasal is diachronically a genitive linker no longer productive (or marginally productive), and the second alternative is that they are part of the word stem inherently (it appears that there are instances of both). Some words clearly have environments without the nasal when used as a noun.

(19) se-m-pea   one flat hard object   so-ndoung   one night
      sa-n-ta'u   one four-legged animal   so-m-bulang   one month
      sa-ng-kayu   one snake-like object   se-m-biti   one time
      sa-n-jangang   one handspan   sa-m-paa   one cluster of s.t.
      se-n-si'u   one cubit   so-m-buli   one branch of s.t.
      sa-n-tanga   one-half   so-m-bo'a   one plate of s.t.
      so-ng-kolo   one cut/shaped heavy object

The vowel in *so-* 'one' always follows vowel harmony regardless of the consonant sequence, which is contradictory to previous examples which shows that *mong-* does not take vowel harmony when the root or stem begins with a consonant. However, if we assume that *ŋ-* is a productive prefix, then by assigning it to level 1 and nasal assimilation to level 1 (L1), then it becomes a new stem or "lexical item" which can then allow vowel harmony to occur in level 2 (L2) without the vowel harmony blocking that occurs from nasal assimilation (see (20).

(20)   [[so][ŋ][pea]]]   Underlying representation
            [[so][mpea]]   L1 nasal assimilation, bracket erasure
            [sempea]   L2 vowel harmony, bracket erasure, resyllabification
            sempea   surface representation

---

[6] The phoneme /s/ does not delete in all lexical words, and in some words it appears to be optionally deleted. When the /s/ is not deleted the preceding nasal becomes the alveolar /n/. Nasals preceding /s/ behave irregularly in many other Western Austronesian languages (e.g. Indonesian, etc.).

6.2 Vowel Harmony Blocked by Nasal Assimilation (Lexical [Level 2])

We have seen that the nasal assimilation is a kind of spreading. Similarly we have seen that vowel harmony spreads. In this section I demonstrate how nasal assimilation blocks the vowel harmony from spreading, since the WFC states that association lines cannot cross (see McCarthy 1988, Kenstowicz 1994, Goldsmith 1990, etc.). Current work on feature geometry appears to be moving towards a consensus that the vowels and consonants have a node on the same tier. We will now dispense with the heuristic useage of [BR] and replace it with the oral node. For example Kenstowicz (1994:469) says:

> Attaching the V-Pl node as a subtree under C-Pl predicts that rules spreading a V-Pl feature from one vowel to another across an intervening consonant will block when the consonant is specified for the relevant feature as a secondary but not as a primary articulation. Although this prediction remains to be systematically investigated, there are cases on record that point in the right direction.

This provides theoretical motivation for the vowel harmony blocking in the case of active voice consonant sequences (contrast to example (18) in §6.1 above where vowel harmony crosses consonant sequences--the lexical phonology module is needed to explain this apparent inconsistency of the phonology, see this discussion in §6.1 and §7). In (21)-(22) the dotted lines show assimilation of features taking place. After nasal assimilation has taken place, vowel harmony cannot apply now because in the current cycle the association lines cannot be crossed. So vowel harmony is blocked by assimilation of a consonant in the same cycle where vowel harmony would normally apply.

(21)
$$\text{oral} \quad \text{oral}$$
$$\text{m o ŋ + b a l i + a'} \longrightarrow$$
$$[+\text{nas}]$$

mom-bali-a'
AV/IR-move-BEN

(22)
$$\text{oral oral}$$
$$\text{m o ŋ + p a r e s a} \longrightarrow$$
$$[\text{nas}] \quad [\text{Coronal] (p,t,k,s)}$$

mom-[p]aresa
AV/IR-check

6.3 Nasal deletion before Sonorants (Lexical [Level 2])

Nasal deletion occurs according to the Obligatory Contour Principle (OCP). The OCP states that "adjacent identical elements are prohibited (see McCarthy 1988:88)" Any word root or stem with an initial sonorant consonant will invoke this rule when preceded by a nasal prefix. When the nasal assimilation occurs, the OCP is met and the initial consonant is deleted. Vowel harmony is still blocked, as occurs when nasals precede obstruents, as shown in (23)-(25).

(23)	a.	oral oral
             | |

m o ŋ + ŋ   o ŋ o   nasal assimilation
    | vowel harmony blocked
 [nas] [nas]

b.	oral oral
             /| |
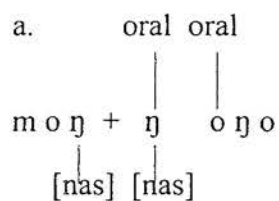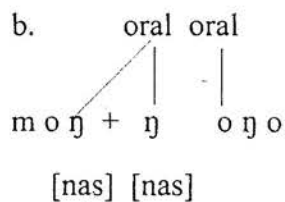
m o ŋ + ŋ   o ŋ o   ⟶   mo(ŋ)-ŋoŋo
                                  AV/IR-cook
 [nas] [nas]
    |
    ↓
    ∅   OCP causes nasal deletion

(24)	a.
              oral oral
               | |

m o ŋ   l   a ŋ g i r   nasal assimilation
     | | vowel harmony blocked
    = |
 [nas] [lat]

b. oral oral
         /| |
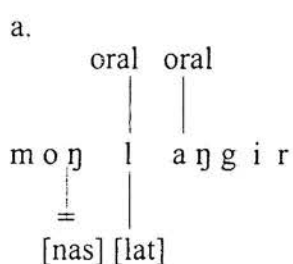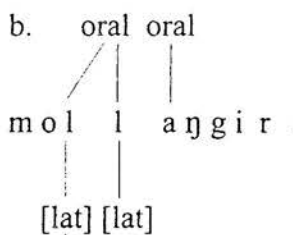
m o l   l   a ŋ g i r   ⟶   mo(ŋ)-laŋgir
     | | AV/IR-ceremonial washing
 [lat] [lat]
    |
    ↓
    ∅   OCP causes lateral deletion

(25)	a.
              oral oral
               | |

m o ŋ   r   a m p u ŋ   nasal assimilation
     | | vowel harmony blocked
    = |
 [nas] [son]

b.　oral　oral

mo r　r a m p u ŋ ⟶　　　　　　mo(ŋ)-rampung
　　　　　　　　　　　　　　　　　　AV/IR-burn

[son] [son]

∅　　　　　　　　　　　　　　　OCP causes r-deletion
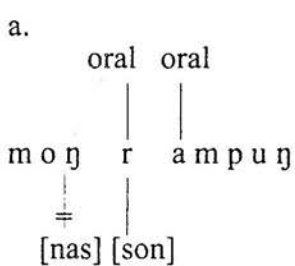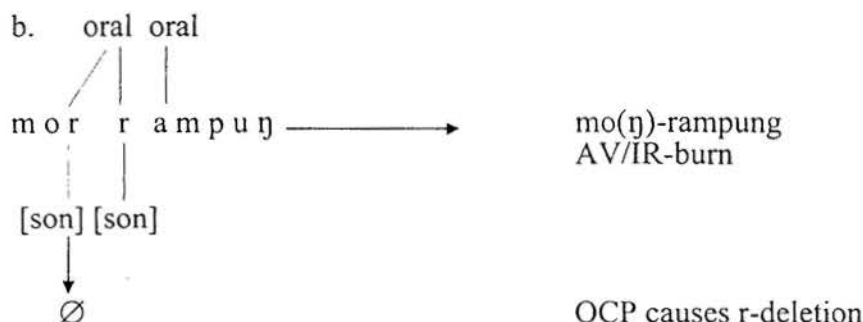
6.4 Glottal Assimilation (Lexical [Level 2])

Autosegmental phonology once again provides motivation for selecting the glottal stop over the voiceless velar stop [k] as underlying where they alternate. Diachronically it is clear that the glottal stop in Pendau, in many words (if not all), is a reflex of *k (see for example Kaili-Pamona languages, Martens in prep.). Positing an underlying *k for glottal stops does not work since there are minimal pairs which show contrast and there are clear instances of [k] in many other analagous environments. Following an autosegmental approach I will show that the simplest approach is to posit the glottal stop as underlying in the cases where it alternates with [k], and that when [k] appears after the velar nasal it is due to a spreading of a point of articulation to the adjacent glottal stop. The rule presented in (26) demonstrates how the point of articulation assimilates to the nasal voicing, and then delinks the constricted glottis point of articulation resulting in the back velar stop [k].

(26)　　　　　ŋ　　　　　ʔ　　　　skelatal

　　　　　[+son]　　　[-son]　　　root

　　　　　Oral　　　Pharyngeal　　cavity

　　　　　Glottal　　　Glottal　　articulator

　　　　　[ŋ]　　　　[k]

The paradigm in (27) illustrates that all of the data can be accounted for under this viewpoint. Underlying k can be contrasted with underlying $ʔ$ in the environment of active voice prefixes. Underlying ks will delete like the other obstruents in its natural class (p, t, k, s) when preceded by the nasal segment (voiceless obstruent deletion rule).[7] Whenever a [k] is found in the surface following a nasal segment (in this particular boundary) it has to be from an underlying glottal stop. This can also be verified by other affixes which end in a vowel. The glottal stop remains a glottal stop intervocalically.[8]

---

[7] This phonological process is not isolated to Pendau. The same process that assimilates the glottal stop to the voicing in Pendau occurs in the neighboring Kaili-Pamona group. In Da'a and Ledo (Kaili languages) voiceless obstruents assimilate the voicing of an affixed nasal. It is also clear that the two sets of data reflect two different historical stages of Pendau. Those with *k* probably reflect borrowing at a later stage, as Bill Foley pointed out during the AFLA7 conference.

[8] Glottal stops appear to have a different range in the Kaili languages. Many cognates words between Da'a and Pendau for example contrast *k*s and glottal stops, as in *kayu* and *'ayu* 'wood, tree' respectively. The Da'a data is from Barr's lexicon database, personal communication, and Barr 1990; also compare Ledo data in Ghani Hali 1990.

(27)

gloss	root	AV/IR	IV/IR	IV/RE
bring	'omung	mongkomung	ro'omung	ni'omung
call	'ai	mongkai	ra'aia'	ni'aia'
shave	'our	mongkour	ro'our	ni'our
cut, break	'olog	mongkolog	ro'olog	ni'olog
scratch	'a'ar	mongka'ar	ra'a'ar	ni'a'ar
type	ketik	mongetik	reketik	niketik
file	kikir	mongikir	rekikir	nikikir
carry	kova	N/A	rokova	nikova

7. LEXICAL PHONOLOGY LEVELS (STRATA) IN PENDAU

Lexical phonology splits the phonology into two modules: the lexical and the post-lexical modules. Phonological processes within the lexical module apply in a cyclic manner. In figure 3 I have proposed three levels for the Pendau lexical phonology.
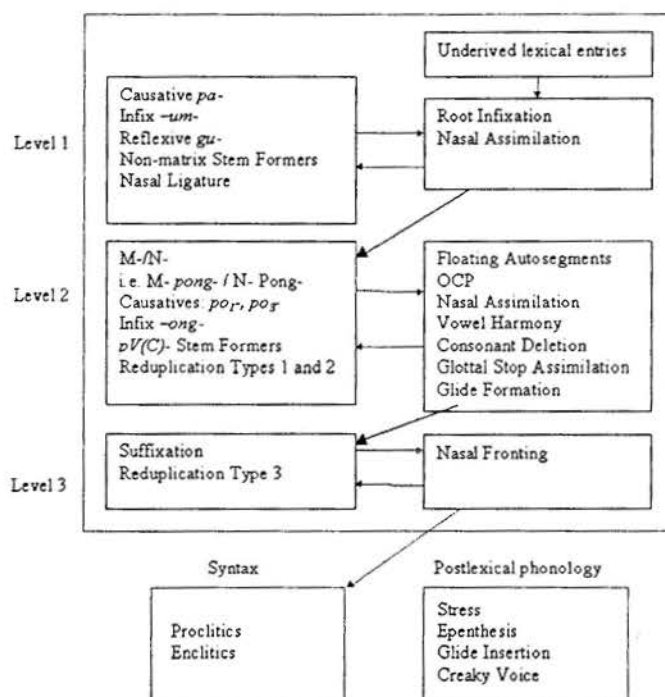
Figure 3. Levels in Pendau Lexical Phonology

The Strict Cycle Condition and the Elsewhere Condition both apply at all levels within the lexical module. The Elsewhere Condition allows disjunctive phonological rules to apply the more specific or idiosyncratic rules when there is a choice between two rules that would apply. The Strict Cycle Condition allows phonological processes to be recycled such as vowel harmony and resyllabification as additional affixes are combined into a word. The Strict Cycle Condition is a complex formulation that has solved complex problems in phonology and solves an apparent conflict in Pendau phonological rules as well. Goldsmith provides a simplified statement of the formulation (1990:223; see Kenstowicz 1994:208 for a more formal statement):

> ...a rule must apply to phonological material at the first chance – the first cycle – or else for ever hold its peace, and must never return to that earlier cycle to have an effect.

Each morphological non-root formative (i.e. affixes) is associated with a particular level and is added at the appropriate level for the word formation process, and not at the beginning of the entire lexical module. All lexical derivations go through each level (see Kenstowicz 1994:214). Each level has phonological rules that interact cyclically with each applicable process for that particular string sequence (the Strict Cyclicity Rule and Elsewhere Condition constraining the overall procedures). After all phonological processes have applied for one level than the bracket erasure convention is applied on those formatives which have been affected. The bracket erasure invokes resyllabification where that is applicable. The output of each level is a "lexical item" (as defined by Kenstowicz 1994:214). Later levels must interact with the new string output as a whole unit.

Earlier levels in the word formation process are assigned affixes closer to the root. Level 1 in Pendau has the more idiosnycratic processes such as nasal ligature assimilation as well as the *pa-* causative, the *gu-* reflexive, the infixation of the –*um-* aspectual infix, etc. These are all affixes close to the root. Nasal assimilation is the only feature changing phonological process in level 1 (notice that it also applies in level 2; phonological processes may apply in adjacent levels, see Katamba 1993:140).

Level 2 has the greatest number of affixes assigned to it and also has the greatest number of phonological processes which can apply. The affixes assigned to level two are *pV(C)*- stem formers, causatives *po$_1$-, po$_3$-,* the infix –*ong-* and the reduplication types 1 and 2. Feature changing phonological processes which apply here are vowel harmony, nasal assimilation, glottal stop assimilation, voiceless consonant deletion, the application of the obligatory contour principle (OCP), and template copying for reduplication types 1 and 2. Some processes such as vowel harmony are iterative as they may apply to more than one affix.

Examples of word formation processes at level 2 are illustrated in example (28). The first cycle deals with the root (see Kenstowicz 1994:208-209), but none of these phonological processes are applicable to the root (or stem). Cycle 2 applies vowel harmony and nasal assimilation processes on the words that will be output as *momaresa* 'check' and *mangabut* 'weed, clear'. Blanks (indicated by dashes) are rules inapplicable at that cycle for those formatives. Vowel harmony and nasal assimilation have to be on the same level. If nasal assimilation applied at a previous level to vowel harmony then vowel harmony would be blocked in all words (not just those with underlying consonant sequences) since the bracket erasure convention would erase the affix boundary from the word base, and vowel harmony could never apply. Sample derivations of nasal assimilation, vowel harmony (and blocking), and voiceless consonant deletion are provided in (28).

(28)

[moŋ] [paresa]	'check'	[moŋ] [abut]	'clear, weed'	Cycle 1 (Level 2)
----------------		----------------		Nasal Assimilation
----------------		----------------		Vowel Harmony
----------------		----------------		Vl. Cons. Deletion
----------------		----------------		Glottal Stop Assim.
----------------		----------------		Glide Formation

		Cycle 2 (Level 2)
[mom] [paresa]	---------------	Nasal Assimilation
(blocked)	[maŋ] [abut]	Vowel Harmony
[mom] [aresa]	---------------	Vl. Cons. Deletion
---------------	---------------	Glottal Stop Assim.
---------------	---------------	Glide Formation
[momaresa]	[maŋabut]	Bracket Erasure,
		Resyllabification

In Pendau not all voiceless consonants are deleted in apparently the same environment, however the application of the Strict Cycle Condition (SCC) easily resolves this issue. The sample derivation in (29) demonstrates that the harmonic stative causative prefix *po₁*- remains unaffected by the voiceless consonant deletion rule. The roots *lalo'* 'deep' and *ide* 'small' are causativized and mean 'deepen' and 'decrease' respectively. Cycle 2 can only refer to information between the [po] [ide] boundaries, and so only vowel harmony applies. Cycle 3 can only refer to information between the [moŋ] [pe] and the nasal assimilation applies, but then nasal assimilation blocks the vowel harmony from applying (see §6). Voiceless consonant deletion cannot apply because the segments in [pe] were already affected in an earlier cycle (cycle 2).

(29)

[moŋ] [po] [lalo'] 'deep'	[moŋ] [po] [ide] 'small'	Cycle 1 (Level 2)
---------------	---------------	Nasal Assimilation
---------------	---------------	Vowel Harmony
---------------	---------------	Vl. Cons. Deletion
---------------	---------------	Glottal Stop Assim.
---------------	---------------	Glide Formation
		Cycle 2 (Level 2)
		Nasal Assimilation
[moŋ] [pa] [lalo']	[mom] [pe] [ide]	Vowel Harmony
---------------	---------------	Vl. Cons. Deletion
---------------	---------------	Glottal Stop Assim.
---------------	---------------	Glide Formation
		Cycle 3 (Level 2)
[mom] [pa] [lalo']	[mom] [pe] [ide]	Nasal Assimilation
(blocked)	(blocked)	Vowel Harmony
---------------	---------------	Vl. Cons. Deletion
---------------	---------------	Glottal Stop Assim.
---------------	---------------	Glide Formation
[mompalalo']	[mompeide]	Bracket Erasure

The derivation in (30) shows the interaction between level one and level two and demonstrates the need for assigning the causative prefix *pa*- to a different level than the other causative prefixes. Since the voiceless consonant in *pa*- deletes it cannot be in the same level as the *po₁*- causative prefix, since the SCC would prohibit the deletion of this consonant. This supports the lexical phonology model where bracket erasure at the end of a level, level 1 in this case outputs in essence a "lexical item" and enters the next level as a

unit. This will then allow the initial voiceless consonant to delete as it does in words like *paresa* 'check' (see the derivation in (30)). The causative prefix *pa-* changes the lexical meaning of *guru* 'learn' to *paguru* 'teach' and *inang* 'eat' to *painang* 'feed'.

(30)

[moŋ] [pa] [guru]	'learn'	[moŋ] [pa] [inaŋ]	'eat'	Cycle 1 (Level 1)
-----------------		----------------		Nasal Assimilation
[moŋ] [paguru]		[moŋ] [painaŋ]		Bracket Erasure
				Cycle 1 (Level 2)
-----------------		----------------		Nasal Assimilation
-----------------		----------------		Vowel Harmony
-----------------		----------------		Vl. Cons. Deletion
-----------------		----------------		Glottal Stop Assim.
-----------------		----------------		Glide Formation
				Cycle 2 (Level 2)
[mom] [paguru]		[mom] [painaŋ]		Nasal Assimilation
(blocked)		(blocked)		Vowel Harmony
[mom] [aguru]		[mom] [ainaŋ]		Vl. Cons. Deletion
-----------------		----------------		Glottal Stop Assim.
-----------------		----------------		Glide Formation
[momaguru]		[momainaŋ]		Bracket Erasure

Going back to level one will provide the motivation for explaining why vowel harmony is blocked by nasal assimilation when there are consonant sequences for the active voice prefixes *mong-/nong-* but vowel harmony is allowable for certain cases such as for classifiers (see §6.1). So a combination of theoretical insights from lexical phonology and autosegmental phonology provide a powerful, motivating and elegant solution to the vowel harmony blocking problem.

8. VOWEL HARMONY IN WESTERN AUSTRONESIAN LANGUAGES

Vowel harmony exists in several Western Austronesian languages, however there has never been a diachronic overview of the historical relationship of this interesting phonological phenomenon or a systematic study or survey. It appears that vowel harmony may have been an innovation that occurred at some point in the history of these languages. Languages in Sabah, Malaysia are noted to have vowel harmony. Hurlburt (1988) mentions briefly vowel harmony in Eastern Kadazan where the root vowels are affected by affixes (i.e. the root vowel(s) harmonize to a specific vowel in a prefix or a suffix). Boutin (1988, 1994) mentions vowel harmony in Bonggi (also called Banggi) which has some similarities to Pendau and Balantak. Kroeger (1994) mentions vowel harmony in Kimaragang, and it is clear from the pronoun and verbal systems in Sabah that there are a lot of similarities between some Sabah languages and of languages in Central Sulawesi. Balantak, a Saluan language in eastern Central Sulawesi has vowel harmony in prefixes and suffixes (see Busenitz 1991, 1994). Lauje and Tialo have similar vowel harmony as Pendau (Whatley nd. and 1984; Himmelmann 1991; Yoshimura in prep.). Vowel harmony in the Tomini-Tolitoli group is a striking phonological characteristic of the verbal system of many if not all of these languages. In light of indications that this is a significant group characteristic, the historical and comparative implications demands a close look at the data

and a detailed investigation over these Western Austronesian languages. Historical comparativists should welcome an additional phonological feature that will lend another criterion to reconstruction and increase the accuracy of their methodology.

Van den Berg has proposed a verbal reconstruction for Proto-Celebic (1991, 1995; see figure 4 below; also compare Mead 1997, 1999). Vowel harmony phenomena should provide a more detailed explanation for the Proto-Celebic verbal marking system. Some readjustment of his proposal will be required in light of the major use of vowel harmony in the Tomini-Tolitoli group. Van den Berg (1991:4) states: "Most modern Celebic languages have verb classes marked by *ma-/mo-/me-*, some of which appear to have semantic or grammatical correlates (notably transitivity), but usually with a large degree of randomness. Data from the Tomini languages suggest that these classes may have developed from an earlier partial vowel harmony system." In the Kaili-Pamona languages it is clear that vowel harmony has littered the prefix system in the Da'a and Ledo (Kaili languages) and left it non-productive (see Barr 1988 and Evans personal communication). It is hard to imagine that vowel harmony did not precede the Kaili languages at an earlier proto stage which overarches Kaili and the Tomini-Tolitoli groups (again compare figure 4, since the Proto-Celebic is essentially the same as the Kaili language affixes). Noting that vowel harmony appears in several Western Austronesian languages is more than curious. It suggests that either vowel harmony was an important part of the protolanguage or that there is as yet some unexplained phonological motivation (or both?) similar to tonogenesis that creates this phenomenon. The rapid growth of phonological theory has already made an impact in our understanding of the processes of vowel harmony.

	Proto-Celebic	Pendau
Active Voice	mo-/no-	mong-/nong-
	ma-/na-	(mang-/nang-,
	me-/ne-	meng-/neng-)
Dynamic	Ø-/Ø-	me-/ne-
	me-/ne-	
	mo-/no-	
Stative	Ø-/Ø-	mo-/no-
	ma-/na-	(ma-/na-, me-
	mo-/no-	/ne-)

Figure 4. Some Proto-Celebic Verbal Prefixes Compared with the Cognate Pendau Prefixes
(parentheses indicate Pendau Vowel Harmony; Proto-Celebic Affixes based on van den Berg 1995)

This discussion has provided extensive data of vowel harmony in Pendau. The large number of prefixes that are harmonic provides an interesting showcase for vowel harmony. Theoretical implications of vowel harmony as described for Pendau should provide further fodder for phonological theoreticians as well as for historical and comparative researchers.

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Malagasy, Binary Branching and Null Subjects
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Introduction

In this paper, it will be shown that the interaction between Kayne's Binary Branching [as in Kayne (1981) and implemented for Malagasy in Randriamasimanana (1999c)] and the (nominal vs non-nominal) nature of the element that can show up under Infl(ections for tense/aspect) [as outlined in Randriamasimanana (1997)] will determine whether a **null element** is **allowable** —iff Infl does not comprise a nominal element-- or **not allowable** —iff Infl comprises a nominal element-- in the external subject position.

The above account of the distribution of null subjects in Malagasy has several consequences and puts to the fore the crucial importance of the Specifier-Head relationship in the grammar of this language. The major purpose of this paper is four-fold:

(i)   to outline the specific subsystem in which the tense and aspect system of Malagasy interacts with both Binary Branching and the minimalist type of phrase structure proposed in Koizumi (1995) and shown to be relevant for Malagasy in Randriamasimanana (1999a) to yield the basic/building block structures found in this Malayo-Polynesian language;

(ii)   to show specifically how more complex constructions involving for instance, motion verbs can be said to derive from 'mergers' of pre-existing, actual, surface binary structures of Malagasy, taking into account the crucial distinction between arguments and adjuncts established in Randriamasimanana (1999b) and

(iii) where the process of incorporation, which is triggered by the positive value for the verbal atomic feature [+/- CONTROL] associated with the higher verb plays a crucial role in the formation of such complex structures in Malagasy, as outlined in Randriamasimanana (1998) and discussed in some depth in Randriamasimanana (1986: 29-74).

(iv)   As many of the issues raised above are illustrated in many of the examples found in Keenan (1999), some of this author's Malagasy sentences will be used to show precisely how Binary Branching applies to this language, forcing a Small Clause analysis of some of the complex Malagasy illustrations.

This paper is organised as follows: In Part I, some justification for a Binary Branching analysis of Malagasy sentences will be proposed, based on a Small Clause analysis of predicates involving lexical causative verbs like 'kill' (section A), motion verbs (section B) as well as di-

193

transitive verbs (section C). Part II will initially distinguish between discourse-based null subject phenomena and linguistic utterance-based null subject phenomena before looking into the nature and function of Malagasy AGR(eement). Part III will subsequently propose an account of the distribution of linguistic utterance-based null subject phenomena in terms of the nominal or nominal nature of the Inflections for tense and aspect outlining the crucial importance of the Spec-Head relationship.

As a starting point, we will assume the following type of tree diagram reproduced from Randriamasimanana (1998: 304), where a distinction is made on Figure 1 between a lexical item projection like V as opposed to a functional head projection like Infl(ections) for tense/aspect. In addition, Figure 2 gives a summary of the distribution of Empty Categories of type 2 (see sections D, F, J and K below for relevant details) in Malagasy.
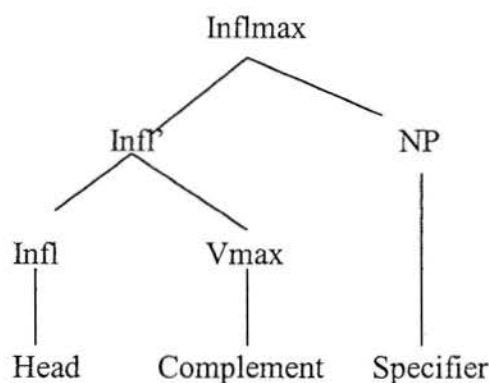
Where head = lexical = { V, P, N, A}; head = functional =
{ tense, aspect, agreement}; NP = DP or bare noun
Figure 1: X-Bar Theory and Tree Geometry

Summary of the Distribution of Empty Categories
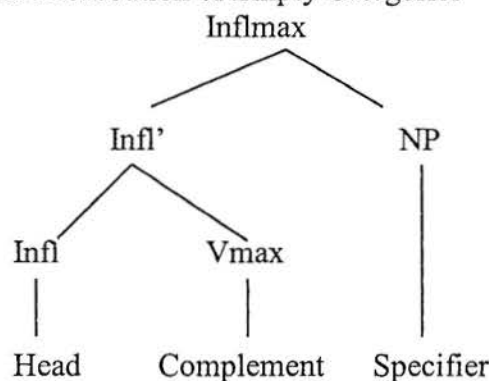
(i)   AGR/Nom.Tense............Overt NP
(ii)   ⁻[- Finite].....................empty
Randriamasimanana (1998: 304)

Nom(inal) = AGR, tense-markers like *no* (past) and *ho* (future).
Not nominal = tense-markers like *n-* (past) and *h-* (future).

Part I: Malagasy and Binary Branching

Section A: Lexical causative verbs.

In order to understand the necessity for a Binary Branching type of analysis a la Kayne (1981) for Malagasy, we need to look at lexical causative verbs like 'kill' in utterances of the following kind:

(1) N-amono   tsy n-aha-faty   i Paoly.
      Past-kill   not past-cause-dead   art. Paul
      Lit:'Paul killed but did not cause (someone) to die.'
      i.e. English: 'Paul tried to kill (someone), but did not manage to.'

<div align="right">Randriamasimanana (1999.a: 513)</div>

The continuation 'but did not cause (someone) to die' is perfectly grammatical and acceptable in Malagasy since there is absolutely no contradiction involved in the entire sequence shown in (1). The reason for this is that the first verb *n-amono* 'kill' is derived from a combination of two different predicates, i.e. a higher verb *anao* 'do' compressed into *an* and a lower predicate *vono* 'kill'. This lower predicate can be part of a Small Clause made up of a root *vono* and an empty subject; whereas the higher verb *an* will take a tense-marker, in this case the past tense-marker *n*. That the lower predicate can often be part of a Small Clause with an empty subject can be illustrated with the following utterance originating from a recent Malagasy newspaper:

(2) Tsy mbola   teraka   hono   ⁻ !
      Not yet   born   be-said Empty subject Nonverbal
      predicate
      "X is said to be not yet born!"

<div align="right">Randriamasimanana (1998)</div>

Where *teraka* 'be born' is a root serving as a predicate in a so-called nonverbal construction, hence the label Small Clause. Such a distinction between so-called nonverbal constructions and verbal constructions was established as far back as Rajaona (1972) for Malagasy. Essentially the distinction hinges on the fact that Malagasy verbal predicates take a tense-marker, whereas nonverbal predicates can only accommodate aspectual markers to the exclusion of tense-markers.

As far as the second part of the utterance shown in (1) is concerned, the second predicate is a combination of the higher causative verb *aha* 'cause' and the root predicate *faty* 'dead'. This causative predicate carries an entailment of whatever is asserted in the lower Small Clause, which can be represented thus:

(3) Faty   ⁻ .
      'dead'   Empty subject
      Nonverbal predicate

Thus the higher verbs used in (1) describe two different situations in Malagasy: While the higher *anao* for the first verb compressed into *an* refers to the inception of some activity described by the verb, the higher verb *aha* for the second verb refers to the completion of the activity being described. In both instances, the lower predicate is a root word which can be part of a Small Clause, as defined above with reference to Rajaona (1972).

Section B: Motion verbs.

An analysis of motion verbs in Malagasy will also require utilisation of the notion Small Clause along with consideration of verbal atomic features such as CONTROL inherent in the relevant higher verb. This essentially means that all motion verbs in this language will have to be analysed in terms of a higher and a lower verb along lines sketched above for lexical causatives like 'kill'. Thus

(4) **N**-an-deha   **t**-any Antsirabe   i Paoly
     past-prf-go   **perf**-to Antsirabe   art Paul
     [+ CONTROL]   **Argument**
     'Paul went to Antsirabe.'

(5) **N**-an-deha   i   Paoly
     past-prf-go   art Paul
     'Paul went'

(6) **T**-any Antsirabe   i Paoly
     perf-to Antsirabe   art Paul
     'Paul went to/was in Antsirabe.'
                                        Randriamasimanana (1999b.)

The (complex) motion verb shown in (4) can be decomposed into a higher verb, as in (5), and a lower verb, as in (6). Note that the higher verb *n-and*eha 'went' takes a past tense-marker, whereas the lower verb takes an aspect-marker *t*-. The main reason why this morpheme t- is analysed as an aspect-marker and not as a tense-marker is due to the fact that the higher verb contains the atomic feature [+ CONTROL], which will trigger incorporation of the embedded Small Clause into the higher verb, thus turning the constituent *t-any Antsirabe* into an argument of the higher verb and not into a mere adjunct. This distinction between an argument of the verb and an adjunct was already noted although not accounted for in Rabenilaina (1985).

It was shown in Randriamasimanana (1999b) that when the higher verbal predicate does not take a positive value for this atomic feature, i.e. [- CONTROL], then the embedded Small Clause will simply remain an adjunct and will not become an argument of the higher verb:

(7) **N**-i-petraka   **t-any** Antsirabe   i Paoly.
     past-prf-stay   **perf-at** Antsirabe   art Paul
     [+/- CONTROL]   **Argument/Adjunct**
     'Paul stayed at Antsirabe.'

(8)   **T-any** Antsirabe no   n-i-petraka   i Paoly.
        Past-at Antsirabe part past-**prf**-stay   art Paul
        Adjunct   **[- CONTROL]**
        'It was at Antsirabe that Paul was living.'

(9)   **T-any** Antsirabe no   n-ipetrah-an'   i Paoly.
        Perf-at Antsirabe part pst-i-root-**circ**-by   art Paul
        Argument   **[+ CONTROL]**
        'It was at Antsirabe that Paul made his home.'
                                            Randriamasimanana (1999b.)

Thus in (7) the verb 'n-ipetraka' 'stayed' in Malagasy is ambiguous between a + or a -
CONTROL interpretation in that it could mean either that 'Paul took an active part in selecting
his place of residence' or simply that 'Paul just happens to be living at this particular location'. In
its [- CONTROL] interpretation, the constituent made up by *t-any Antsirabe* will remain a mere
adjunct of the higher verb. The independent evidence that shows that indeed it remains an adjunct
is provided in (8): When the constituent is moved to the front, nothing happens to the higher verb,
it remains in the active voice. On the other hand, when the higher verb has a positive value for the
same feature, as shown in (9), then when the constituent is moved to the front, the higher verb
must be passivised otherwise an ungrammatical sequence will ensue.

Section C: Di-transitive verbs.
          It is not only lexical causative verbs like 'kill' and motion verbs which require a Small
Clause analysis. Di-transitive verbs also do. Consider the following:

(10)   N-anome *an'i Jeanne ilay boky*   *i Paoly*
        'past-give DO art. J.   the(previous mention) book art. Paul'
        'Paul gave Jeanne the (previously mentioned) book.'

(11)   *An'*   *i   Jeanne ilay boky.*   = Small Clause S.
        Nonverbal
        Predicate article J.   article book
        'The (previously mentioned) book belongs to Jeanne.'

Where the nonverbal construction *an'i Jeanne ilay boky* shown in (11) does have an independent
existence as a clause of its own: In this utterance *an* is a nonverbal predicate in that it certainly
cannot accommodate a tense-marker –just like other Small Clauses of Malagasy. In (10) the same
word is tentatively analysed as a case-marker. However such an analysis will not do since if we
replaced the constituent *an'i Jea*nne with another constituent like *ilay olona* 'the (previous
mention) person', the putative case-marker will not have to appear at all. In fact, it will now be
purely optional:

(12)   N-anome *(an) ilay olona   ilay boky*   *i Paoly*
        'past-give (DO) art. person   the(previous mention) book   art. Paul'
        'Paul gave the person the (previously mentioned) book.'

If on the other hand, we analyse *an* as a nonverbal predicate, an explanation for the optionality of the nonverbal predicate *an* is readily available in Malagasy. When the word is present within the utterance, there is no particular problem since it will mean something like 'belong'. If it is absent from the utterance, then we obtain a slightly different kind of Small Clause, a subtype described in some depth in Rajaona (1972):

(13)   *Tsena   ny olona.*
        Market   the people
        'People hold market.'
                            Rajaona (1972)

Where the word *tsena* 'market' serves as a nonverbal predicate and where the constituent *ny olona* 'the people' will be the grammatical subject so that the thematic relationship obtaining between the two elements is one involving possession.

While up to this point the difference between a case-marker analysis and a Small Clause analysis may still not be decisive with respect to the utterances shown in (10) and (12), here is a case where it does make a crucial difference. The following case of di-transitive verbs comes from Keenan (1999: 34).

(14)   *Nanolotra vary **ho** an'ny vahiny   t-amin'ny lovia vaovao aho*
        Past-hand rice   to the guest   past-with the dish new   I

The intended meaning for (14) is: 'I presented rice to the guest on the new dishes.' However, the Malagasy sentence means something entirely different, i.e. 'I presented rice (which was destined) for the guest on the new dishes' with a relative clause kind of meaning.

One major assumption inherent in (14) analysed as meaning 'I presented rice to the guest on the new dishes' is that the particle *ho* (just like the particle *an* in sentence (10) is a case-marker. Unfortunately to the native speaker this word *ho* is not a case-marker, it means something like 'which was destined for' in that it invariably forms the beginning of a relative clause making more precise the meaning of the headnoun *vary* 'rice' to which it is attached.

By contrast, with a Small Clause analysis of (14), we will simply leave the particle *ho* out altogether, obtaining the following two possibilities, both involving Small Clauses:

(15)   *N-anolotra [vary ny vahiny] [t-amin'ny lovia vaovao ⌐] aho.*
        Past-hand   riceI the guest   past-prep the dish new   ⌐I I

(16)   *N-anolotra [ny vahiny vary] [t-amin'ny lovia vaovao ⌐] aho*
        Past-hand   the guest ricei   past-prep the dish   ⌐I I

Both (15) and (16) mean: 'I presented rice to the guest on the new dishes.' In (15), we have two Small Clauses, the first with a nonverbal predicate *ny vahiny* 'the guest'; the second with a

prepositional predicate comprising a past tense-marker *t-* indicating that this constituent is a mere adjunct to the higher verb. In (16), we also have the inverse word order within the first Small Clause.

Part II: Malagasy and Null Subjects

As a preliminary, it is essential to distinguish between discourse context-based null subject phenomena, on the one hand and linguistic utterance-based null subject phenomena, on the other hand, in Malagasy. We will refer to the first category as type 1 null subjects and to the second category as type 2 null subjects. In what follows, we will concentrate exclusively on the nature and function of the latter category.

Section D: Discourse context-based null subjects.

The relevant cases allow access to the identity of the referent from the immediate context of the given utterance. Reference could be either to the speaker/writer as in (17) or to the interlocutor as in (19). Note by contrast that foreigners tend to have an overt grammatical subject even when none is required, as in (18).

(17)   Date: Fri, 05 Mar 1999 12:19:59 -0500
        From: JR<r@magmacom.com>
        To: R<uzsmav@uni-bonn.de>
        CC: fbra2@bigfoot.com

        M-amerina ny arahaba ho an'i Mia sy ny rehetra ⁻ [1st S]
        pres-renew the greeting for art Mia and the all   **Empty**
        '(I) renew my greetings to Mia and to everybody...'

(18)   Subject: Valin'dresaka hoan'i Rina Ralison
        Date: 1997/10/09
        Author: DD d.@math.u-strasbg.fr

        Faly   m-iarahaba   anareo rehetra   aho.
        Happy **pres**-greet   you-plural all   I
        'I am happy to greet you all!'

(19)   Date: Thu, 24 Dec 1998 06:52:17-0500
        From: CRab114103.442@compuserve.com
        Sender: CRab114103.442@compuserve.com
        To: Charles Randriamasimanana

        M-anao   ahoana indray   ⁻?   [1st S in message]
        Pres-do   how   once-more **Empty**?
        'How are (you)?'

Section E: Linguistic utterance-based null subjects.

As will be seen in Part III, there is a direct correlation between the distribution of Malagasy AGR(eement) and the obligatory presence of the grammatical subject ; whereas its absence coincides with the possibility of an empty subject. In other words, with type 2 null subjects, there is a link between the structure of the linguistic utterance and the distribution of empty subjects, specifically there is a crucial relationship obtaining between the inflections for tense/aspect and the like and the grammatical subject within the utterance.

What will first be illustrated below is the crucial relationship between the specifier and its head, and in particular, Malagasy AGR(eement) and the specifier, as this phenomenon has not been extensively explored and discussed in the literature. As noted in Randriamasimanana (1997), AGR imposes a singular vs plural meaning on the grammatical subject of the clause, thus highlighting the crucial importance of the spec-head relationship in this language. Relevant illustrations go as far back as the nineteenth century and include examples from Abinal & Malzac (henceforth A & M) (1888) as well as from contemporary sources:

(20) **Ireo** *m-iady* **ireo**   *ny zanakao.*
      AGR   pres- fight AGR   the **children**-of-yours
      Plural verb **plural**
      'Voil‡ vos enfants qui se battent.'   A & M 1888: 282)
      From French to English: 'Your **children** are there, fighting.'
      Literally:'Your children are fighting --as we can see for ourselves.'

(21) **Io**   *tamy* **io**   *ny zanako.*
      AGR   coming AGR   the **child**-of-mine
      Singular verb **singular**
      'Voici mon enfant qui vient.' (A & M 1888: 281)
      Eng.: 'Here is my **child** coming.'
      Literally;'My child is coming --as you can see for yourself.'

(22) To: fbra2@bigfoot.com
      Date: Mon, 18 Jan 1999 00:38:14 -0500
      From: crazafi@juno.com (Carol M Razaf…)

      Ireto manaraka **ireto ny valin'ireo** ohabolana 11-20…
      AGR verb   AGR the answers
      These pres-follow these the answer-of-those proverbs 11-20
      'The **answers** to proverbs 11 to 20 are following…'

In (20) from (A & M. 1888: 282) and (22) from an e-mail dated January 1999, we have an illustration of a plural AGR(eement), i.e. one of a number of Malagasy deictics such as *io* 'this-singular-near the hearer', *ireo* 'these-plural-near the hearer'and *ito* 'this-singular-near the speaker' and *ireto* 'these-plural-near the speaker' which morphologically encodes the singular vs the plural, which shows up under inflections along with tense and aspect. The grammatical number which appears on AGR will affect the semantic interpretation of the grammatical subject:

Thus, in (20) and (22), because AGR is plural, the subject has to be interpreted as plural; whereas in (21), where AGR is singular, the subject must be interpreted as singular. By contrast if AGR was to be left out in, for instance, (20) or (22), the relevant subject could then receive either a singular or a plural interpretation, depending on the extralinguistic context of situation.

Section F: Nature and Function of Malagasy AGR.

In Malagasy, the absence of morphology corresponding to AGR, tense/aspect indicates a context-dependance of temporal location along the time axis whereas the presence of AGR, tense/aspect morphologically signals overt linguistic encoding of location along the time axis. In the first type of situation, location within the speaker here and now is usually assumed, in other words, 'de re' is assumed to coincide precisely with 'de dicto' and as a direct consequence, no overt indication of time location within the utterance is required since the relevant bit of information is recoverable from the immediate context; whereas in the second, a fundamental and basic distinction between 'de dicto' and 'de re' is assumed and as a result, an overt indication of time location within the utterance is absolutely indispensable since in such a case, there is no possibility of recoverability of the missing pieces of information.

In light of the system described above, the following revised meaning is proposed for the already published sentence below from Keenan (1976: 257):

(23) *ÿ-sasan-dRasoa*   *ny lamba.*
      ÿpass-be-washed-by Rasoa   the clothes
      'The clothes are washed by Rasoa.'

This sentence, which contains a zero tense-marker should mean 'The clothes are being washed by Rasoa' and not as originally claimed by the author. Some evidence pointing in that direction comes from the following electronic message:

(24) To: fbra2@bigfoot.com
      Date: Mon, 1 Feb 1999 01:10:24 -0500
      Subject: Ohabolana 21-30(V), 31-40(L), 1-10(F)
      From: Carol M Razafi... <crazafi@juno.com>

      ÿ-araba**ina**   daholo indray ianareo   rehetra,
      Pass-saluted   all   once   you-plural all
      Literally: 'You **are** all **being** saluted (by me)!'

Where it is quite clear that there is a correlation between the zero-tense morpheme and location within the speaker/writer here and now. This contrasts with the presence of an overt tense-marker, as in the following sentence adapted from E. Keenan (1976: 255]:

(25) *M-anasa*   lamba   amin'ity savony ity Rasoa.
      Pres-wash clothes with this soap this Rasoa
      Translated as 'Rasoa is washing clothes with this soap.'

Which actually means 'As a rule, Rasoa washes clothes with this soap' and not as originally translated. In fact, in order to convey the meaning 'Rasoa is washing clothes with the soap', one has to say:

(26) *Ity   m-anasa   lamba amin'ny savony ity*   *Rasoa.*
       AGR   pres-wash clothes with the soap **AGR**   Rasoa
       'Rasoa **is** washing clothes with the soap.'

Where the singular deictic *ity* 'this' functions as an AGR inside the inflections for tense/aspect and not accompanying the noun *savony* 'soap', as in

(27) *M-anasa   lamba amin'ity savony ity Rasoa.*
       Pres-wash clothes with **this** soap **this** Rasoa

Sentence (27) is a perfect sequence except that its meaning has nothing to do with the original translation provided under (25) but rather with something like: 'Hey, Rasoa, go and wash clothes with this soap!.' Note that this new interpretation is in line with the kind of analysis proposed for lexical causatives in section A above, where the higher verb *an* derived from the compression of *anao* 'do' in (27) will refer to the inception of the activity described by the verb; furthermore, the overt tense-marker *m-* indicating the present tense does not strictly locate the event within the speaker here and now. See Randriamasimanana (1985) for an analysis of this phenomenon.

Part III: An Account of the Distribution of Null Subjects

At this stage, we will look into the distribution of type 2 null subjects. This is linked to the distribution of AGR. In fact, the distribution of AGR coincides with the obligatory presence of the grammatical subject; whereas its absence coincides with the possibility of an empty subject. However, as far as tense projections are concerned, the nominal or non-nominal nature of the head is crucial.

Section J: AGR and Control Structures.

As outlined in Randriamasimanana (1998), **AGR only shows up in a matrix clause** and usually cannot show up in a structure embedded under a Control predicate:

(28)a. N-itady   [... h-anjaka   ⁻] Ravoniarisoa ...
       Past-seek [... fut-dominate EC] Ravoniarisoa
       "Ravoniarisoa sought to dominate."
                From Rajaona 1969, *TN*, page 50, lines 156-157.

  b.   *N-itady [**ity** h-anjaka **ity**   ⁻] Ravoniarisoa.
              AGR   **AGR**

(29)a. M-angataka anao aho   [h-itondra ity any amin-dRama ⁻]
       Pres-ask   you I   [.. fut-take this to pre-Rama EC]

"I ask you to take this to Rama."
From Rajaona 1969, *TN*, p 65, lines 57-60.

b.*M-angataka anao aho [**ity** h-itondra ity **ity** any amin-dR.-]
                AGR   **AGR**

In (28), we have a subject control verb, whereas in (29) we have an object control verb –which poses a problem for our Binary Branching analysis for Malagasy. Research into this question is ongoing and we will postpone presentation of relevant data which will argue for this specific aspect of our analysis. The only point being made is that there is absolutely no possibility whatsoever of having AGR and an empty subject in a structure embedded under a Control predicate, as suggested by the ungrammaticality of both (28)b and (29)b.

Section K: Nominal vs Non-nominal Nature ot Malagasy Tense-markers.
    Malagasy has two distinct series of tense-markers for the future and the past tenses: Thus, the morpheme *h-* indicates the future in a structure with an active voice verb, but another morpheme, *ho* will have to be used to indicate the future in a sequence with the passive voice; likewise for the past-tense, the morpheme *n-* indicates the past in an active voice sequence, but the relevant morpheme is *no-* for the passive voice.
    One first contrast in behavior between the two series of tense-markers is apparent in the following pair ot utterances:

(30)   N-ikasa   ny   **h**-andeha   —   i   Paoly.
        past-intend   comp   **fut**-go   **Empty** deic Paul
        "Paul intended to leave."
                                    Randriamasimanana (1997: 488)

(31)   Tia-ko   **ho** entina   <u>**ilay fiara**</u>.
        be-liked-by-me   **fut** be-driven **the car**
        "I would like to drive the (previous mention) car."

In (30), the embedded predicate is in the active voice and as a result, the relevant future tense-marker is the bound morpheme *h-*; as a further consequence, there is an empty subject in the embedded structure. By contrast, in (31) the embedded structure is in the passive voice and the relevant future tense-marker is the independent morpheme *ho*; as a consequence of this, an overt subject shows up in the subordinate clause. Indeed in (31), the constituent 'ho entina ilay fiara' is a sentential subject of the passive matrix verb.
    Another contrast in behavior between the two parallel series of tense-markers arises from the lexical vs functional nature of the projection. Thus, with a projection involving a purely lexical item, there is a case feature to assign, whereas with a purely functional one, there seems to be no presence of a case feature at all.

(32)   **No-kasa-in'**   <u>**i Paoly**</u>   **ho** entina <u>**ilay fiara**</u>.
        past-intend-by deic Paul   **future** be-taken **the car**
        "Paul intended to take the (previous mention) car."

From Randriamasimanana (1997: 490).

(33)　N-ikasa　　　(ny)　　**h**-itondra ilay fiara ⁻　i Paoly.
　　　Past-intend　(comp)　**fut**-drive the car　**EC**　art. Paul
　　　'Paul intended to drive the (previous mention) car.'

(34)　N-andefa entana　　**ho** azy　　i　Paoly.
　　　past-send parcel　　**part**. him-DO deic Paul
　　　"Paul sent a parcel　which　is for him/her."

(35)　N-andrama-n' i　Paoly　　**no**-loko-ina **ny trano.**
　　　past-try-by　deic Paul　　**past**-paint-by **the house.**
　　　"Paul tried to paint the house."

From Randriamasimanana (1997: 491).

In (34), we have the purely lexical item *ho* as head of construction with the meaning of something like 'which is destined for' and its complement, the pronoun accompanying it, must be in the accusative form of the third person pronoun *azy*. This contrasts with the situation in (33), where the head of construction is the tense-marker *h-* in the embedded clause, a form which is not purely lexical. On the other hand, in (32) the head of the embedded clause is the future tense-marker *ho*, which is exactly the same as the purely lexical item in (34). It looks therefore as though the independent morpheme *ho* in (32) behaves more like a purely lexical item like the one in (34); as a consequence of this, it is legitimate to assume that it carries a case feature with it . Finally, in (35) we have an illustration of the behavior of the independent morpheme for past tense *no*, which is exactly the same as for its future tense counterpart *ho*: Indeed *no* like *ho* requires an overt subject in the embedded structure *no-loko-ina ny trano* even though this form appears to be well on its way to becoming a clitic to the verb and acquiring the status of a verbal prefix.

Section L: Non-nominal Nature of Complementizer.

In essence in (34), we had a purely lexical item projection of the particle *ho*. That contrasts with the behavior of the (apparently) same item serving as a complementizer introducing an embedded equative type of clause, as argued for and illustrated in Randriamasimanana (1986: 562-563) and explained in Randriamasimanana (1997: 491):

(36)　M-ihevitra azy　　**ho**　**m**-ahay　　⁻　i　Paoly.
　　　pres-think　him　　**comp** **pres**-intelligent **Empty** deic Paul
　　　"Paul considers himself intelligent."

(37)　M-itady　　**ho**　babena　　⁻　i　Paoly.
　　　pres-seek　**comp** lift-pass. **Empty** deic Paul
　　　"Paul wants to be picked up."

From Randriamasimanana (1997: 491).

In (36), the embedded clause comprises an equative type of structure (as opposed to a nonequative type or specifically one which involves Control as defined in Randriama-simanana (1986: 29-74)). The relevant complementizer which accompanies such a clause is the function

word *ho* precisely. Note that this function word does not seem to be accompanied by any apparent case feature as an empty subject is permissible in the subordinate clause in both (36) and (37).

Section M: Other Consequences of Spec-Head Relationship.

As the inflections domain within a clause covers projections corresponding to AGR, tense and aspect respectively and since there is a privileged relationship obtaining between inflections as head of the entire sentence and its specifier, it is no big surprise that the semantic interpretation of the subject is influenced by what appears under inflections.

In this section, the co-variation in semantic interpretation of the grammatical subject with the voice, tense and aspect showing up under inflections will be succinctly described. Subsequently it will be shown that Malagasy has recourse to movement to the front as a strategy to avoid an anomalous interpretation of the subject.

The relevant constructions involve a passive voice verb with different inflections for tense and aspect on them. There exist four basic cases to consider:

A. No..in(a) passive typically indicates a **PUNCTUAL** aspect. As a result of this, the subject is usually interpreted as an entity affected as an unanalyzed whole.

(38) No-didi-ndRabe   **ny mofo.**   **Punctual** meaning
       pst-root-pass-byRabe the bread
       'The (whole) bread was cut by Rabe.'

B. ⁻...in(a) passive typically describes an **ONGOING ACTIVITY,** as in (24) above. Typically no overt reference to the referent of the subject is required, which is retrievable from the extralinguistic context of situation.

C. With **an...in(a)** circumstantial voice, we usually have a **DURATIVE** aspect, hence **partitive** interpretation of the subject since its referent is only partially affected.

(39) N-**an**-didi-**an**dRabe   **ny mofo.**   **Partitive** meaning
       pst-active-root-**circ**-byRabe   the bread
       '(Some of the) bread was cut by Rabe.'

D. With **a...in(a)** passive, there is the notion of **INCEPTIVE/BALLISTIC** aspect. Only referents that contain this particular feature, i.e. which only requires an initial impulse will be able to appear in the grammatical subject position.

(40) N-**a**-tsipin-dRabe   **ny rano.**   **Ballistic** meaning
       Past-pass-throw-by-Rabe   the water
       'The water was thrown away by Rabe.'

What appears under subsection C is particularly relevant for a newly published Malagasy sentence reproduced immediately below:

(41)   *N-i-vidi-an-dRabe*   *ilay satroka   Rasoa.*
pst-active-root-**circ**-Rabe   that hat   Rasoa
'Rasoa was bought+for by Rabe that hat.'

From I. Paul, V. Phillips and L.Travis (1999: 27-48).

According to the system outlined in C, the subject *Rasoa* in (41) should receive a partitive reading since the circumstantial form of passive shows up under inflections along the same lines as in example (39), which also contains a circumstantial voice verb. However, it is not clear what it would mean to claim that 'part of Rasoa was bought the hat by Rabe!'

Presumably sentence (41) derives from something like:

(42)   N-i-vidy (an) ilay satroka   ho an-dRasoa   Rabe.
Pst-prf-root (DO) the hat   for DO-Rasoa   Rabe
'Rabe bought the (previously mentioned) hat for Rasoa.'

Instead of (41), a native speaker would say either the a or the b sequence below:

(43)a **No-vidi-n-dRabe**   ho an-dRasoa **ilay satroka.**
PUNCTUAL   **SPECIFIC**
'Was bought by Rabe for Rasoa the hat.'

   b. **ÿ-vidi-ndRabe** ho andRasoa **ilay satroka.**
ONGOING-buy-byR for   Rasoa   the hat
'Is being bought by Rabe for Rasoa the hat.'

The first problem which arises with regard to sentence (41) relates to the incorporation of the constituent *ho an-dRasoa* since it is not obvious that the verb *nividy* 'bought' unequivocally has a [+ Control] meaning. This is important since as shown in   section B, the presence of a positive value for this atomic feature is a sine qua non condition for triggering incorporation of this constituent into the higher verb. And if incorporation does not take place, then the circumstantial voice passive as used in (41) is simply illegal in Malagasy since only an argument of the verb can be promoted to subject, but not an adjunct. But even assuming that such an interpretation of the verb as used in (41) was possible, we are still faced with the thorny issue posed by the partitive interpretation of the subject.

Section N: Obligatory Movement.
At this stage, the question that arises is the following: What happens if the inflections comprise anyone of the tense/aspect elements described above and if the resulting semantic interpretation of the subject is anomalous? Besides the strategy yielding the alternative sentences shown in (43)a and (43)b above, there is another strategy, which consists in moving the affected subject into the front position in the sequence.

(44)   **N**-i-petraka   <u>t-any Antsirabe</u> i Paoly.
          Past-verb   **Perf**-prep
          [+ CONTROL]   **Argument**
          Past-stay past-Antsirabe art. Paul
          'Paul stayed, i.e. chose to stay at Antsirabe.'

(45)   <u>T-any Antsirabe</u> no   n-**i**-petraha-**n**'   i   Paoly.
          Perf-at Antsirabe part. **Past-circ**-live-by   art. Paul
          Argument
          'It was at Antsirabe that Paul was living, i.e.' chose to live.'

(46)   *N-**i**-petraha-**n**'i Paoly   **t-any Antsirabe.**
          Past-circ-live-by art Paul   **Perf**-at Antsirabe
          [+ CONTROL]   **PARTITIVE?**

Thus, in (44) the higher verb *n-i-petraka* can receive a [+ CONTROL] interpretation so that the constituent *t-any Antsirabe* can be assumed to have been incorporated into the higher verb. The evidence for this comes from the circumstantial form of the passive on the higher verb, as in (45). However, it is not possible to keep the newly derived subject *t-any Antsirabe* in the external subject position, as demonstrated by the ungrammaticality of (46): The newly derived subject will have to be compatible with a partitive reading, as is usually the case for subjects accompanying a circumstantial passive form, as illustrated in sentence (39) above. To avoid such an anomalous interpretation, the newly derived subject will have to move out of the range of the projection of inflections, ie. Away from Spec and towards the front.

Conclusion

The main purpose of this paper was to use Kayne 1981 's principle of Binary Branching in conjunction with the concept of Small Clause –in addition to basic principles proposed in Chomsky (1981, 1982 and 1986b)-- to account for the distribution of null subjects in Malagasy. As a starting point, we assumed a kind of tree diagram such as in Randriamasimanana (1998: 304), where there is a distinction between the projection of a lexical item and that of a function word.

Sections A, B and C show that there are advantages to a Binary Branching analysis of even lexical verbs, motion verbs and di-transitive verbs in Malagasy: In section A relative to lexical causatives, it was shown that such an analysis sheds some light on the semantic interpretation of sentences like (1), where the Malagasy verb 'kill' simply does not entail that the patient is dead and that to account for such a reading, we need an analysis of the lexical causative into a higher and a lower verb –this will presumably necessitate a revision of the nature of the projection of lexical verbs as represented on Figure 1 along lines sketched in Koizumi (1995); section B involving motion verbs highlights the crucial importance of the positive value for the atomic feature CONTROL associated with the higher verb in the process of incorporation of the lower structure into the higher verb, as in (4), whereas section C illustrates the superiority of an analysis based on the twin notions of Binary Branching and Small Clause as opposed to a

treatment of certain Malagasy particles as representing case-markings from the main verb, as proposed in (10).

Sections D and E distinguish between discourse context-based null subject phenomena, i.e. type 1 null subjects from linguistic utterance-based nulí subject phenomena, i.e. type 2 null subjects as tentatively summarized on Figure 2. This then paves the way for some understanding of the nature and function of Malagasy AGR in section F in terms of the singular or plural interpretation of the grammatical subject depending on what shows up under the inflections for voice, tense and aspect. The partial description of the distribution of type 2 null subjects described in sections J and K enables us to account for the distribution of empty subjects in terms of the nominal or non-nominal nature of the inflections for tense: This language has a series of parallel tense-markers for at least the future and for the past tense. The selection of the relevant series is dependent upon the verbal voice on the embedded structure as well as the selectional requirements of the higher verb since the latter will often dictate the voice to be utilized in the embedded position, as illustrated in sentence (31), for instance. This is of crucial importance in a language like Malagasy since as outlined in Randriamasi-manana (1999a: 37), it has a very high frequency for passive in texts. One reason why this is so has to with the notion of barriers as proposed in Chomsky (1986b) and illustrated for Malagasy in Randriamasimanana (2000: 274-276). Finally, one of the major consequences of the special relationship between the inflections head of the clause and its specifier is that if there is a clash between inherent features of the subject and those contained in the head inflections, then the subject will have to move out of the the domain range of the head, i.e. to the front within the sequence, as illustrated in (45).This kind of move fits in well within a minimalist framework such as the one proposed in Radford (1997).

The overall picture that emerges from the above is that all Malagasy verbs have to be analyzed as comprising a higher as well as a lower predicate, that the higher verb is compatible with a tense-marker, but that the lower predicate is only compatible with an aspectual marker. This suggests that the inflections projection in Malagasy should be exploded into separate projections of tense as well as aspect along lines sketched in Pollock (1989): Aspect as defined in Comrie (1976) will be the closest to the root or radical of the verb, followed by tense --also as defined in Comrie (1985)—which will have a projection of its own; sitting on top of the previous two projections, we will have an AGR(eement) projection, whose presence requires an explicit grammatical subject in Malagasy. This contrasts with the behavior of tense-markers some of which may be nominal in nature whereas others are not nominal in nature, with direct consequences on the possibility of a null subject.

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Word Order Variation and Topic Continuity in Atayal
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1. Introduction

Previous studies on word order variation have indicated that a correlation exists between the frequency of each word order type in a given language and the factors predicting the choice of one order or another on a particular occasion in that language. This correlation can be established by quantitative approaches to discourse analysis. However, the majority of the text counts have not considered possible skewing of the data, failed to distinguish the truly important factors from the minor ones, and did not consider the possibility of interactions among factors. In this study, a multivariate analysis is used to address these problems.

This study attempts to investigate how discourse functions account for the VS/SV word order variation in Atayal, an Austronesian language spoken in Taiwan, based on a variation approach to discourse analysis (Myhill 1992, Schiffrin 1994). GoldVarb 2.0 (Rand & Sankoff 1990) is used to analyze all the factors accounting for the word order alternation.

A pilot study (Rau 1997b) of word order variation in Atayal indicated topicworthiness was the only factor that could account for word order variation. However that analysis was based only on one narrative text with 204 tokens. Although one cannot put too much weight on the results of the pilot study due to the idiosyncratic nature of a single text, the methodology points to a promising direction for future study on word order variation. Thus the current study utilizes four times as much data collected from the Mstbon[1] community, where Squliq Atayal is spoken. The results are parallel to those obtained for Ute (Givón 1983) and Chamorro (Coorman 1983) using a different method.

The organization of the paper is as follows. The brief introduction is followed by a literature review of previous discourse studies on word order variation and studies on the grammar and discourse of the Atayalic languages. After the methodology of the study is laid out and the analytical categories are defined and illustrated with examples from the texts, the results and a discussion of the factors accounting for word order alternation between VS and SV are presented.

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[1] For detailed information on the social stratification of the community, phonological variation, and sound change, please refer to Rau (2000).

2. Literature review

2.1. Word order variation

Previous discourse studies on referring terms have shown sequential dependencies across clauses (Ariel 1990, Fox 1987, Givón 1989, Tomlin 1987). The first mentions of a referent tend to be indefinite and explicit, while the second mentions tend to be definite and less explicit. The main functional factor underlying this distribution is information status and accessibility (Ariel 1990, Chafe 1987, Prince 1981).

Textual evidence from Chamorro (Cooreman 1983, 1992), Tagalog (Fox 1985), and Ute (Givón 1983), among others, suggest that word order variation can be explained in terms of referential continuity and thematic continuity. The unmarked VS order correlates highly with referential continuity and is more common in paragraph medial and final position, whereas the marked SV order is used to mark topic discontinuity and is more commonly found when the thematic unity of the paragraph is disrupted.

Myhill (1992:164-215) reviews the results of a number of studies of word order variation in individual languages, focusing on the order of subject, object and verb, and proposes the following two generalizations on sequencing. First, "temporal sequencing", or an equivalent for Hopper's (1979) "foregrounding", correlates strongly with VS order in strongly VS languages. This finding echoes Hopper's (1987:471) statement, "Verb-initial clauses narrate, noun-initial clauses describe." Second, a general discourse principle in languages with a high proportion of VS order can be summarized with the following statement: "Putting the most important new information at the beginning of the clause." His findings are consistent with Herring's (1990) universal pragmatic word order pattern, which claims that marked or contrastive topics (or shifted topics) tend to go in initial position in all languages. Other studies of basically verb-initial languages (Payne 1995, Longacre 1995) also suggest that preverbal position is associated with arguments which are more or less "unexpected".

Cumming (1997) offers an explanation for the association between the discourse functions of predicate-initial order and patient-prominent syntax in Western Austronesian languages. Specifically, parameters related to the semantics of events (including perfective aspect and telicity) and parameters related to the semantics and pragmatics of noun phrases (including definiteness and referentiality of the patient) are shown to correlate in several languages, corresponding to Hopper & Thompson's (1980) construct of "high discourse transitivity". In order to ensure the comparability of future studies, Cumming proposes two checklists listing factors of discourse functions and morpho-syntactic features relevant to the analysis of constituent order alternations.

Quakenbush (1992) draws attention to the variation of word order by discourse type. He claims that the incontrovertible verb-initial status of Austronesian languages is

established by narrative-based discourse analysis. However, different text types were found to present differing "basic orders", defined as "textual frequency" according to Hawkins' criteria (1983:13). The basic verb-initial word order in Agutaynen narrative texts presents a mirror image of that in expository texts. In other words, the "subject-like nominal" (the *ang* NPs) precede the verb more often in expository texts. Longacre (1982:484) attributes this alternation to the topic-comment structure of expository discourse. In reaction to the narrative bias tradition of discourse analysis, Cumming (1997) also calls for future research to take up questions of constituency and argument structure in conversational discourse.

In summary, in strongly VS languages, the unmarked VS order is associated with topic continuity, whereas the marked SV order is associated with topic discontinuity. Two types of quantitative methodology have been proposed by Givón (1983) and Myhill (1992). The former measures degrees of topicality by counting the referential distance, persistence (decay), and potential interference/ambiguity of the third person referents in narratives. The latter, on the other hand, applies statistical tests to distinguish the truly important factors from the minor ones and considers the possibility of interactions among factors in word order variation.

2.2. Word order in the Atayalic languages

Previous studies on the grammatical structure of the Atayalic languages agree on the primarily verb-initial status of the language group but differ in terms of the definitions of S and O and "basic" word order. In the following review of these studies, the discussion begins by summarizing the generalizations on word order of different dialects and ends with a comparison of the two major views.

2.2.1. Squliq Atayal

According to Egerod's (1966) description, nouns usually follow verbs. However, if the sentence contains a preverb (including nonconjugatable quasi-verbs, verb particles, modal adverbs, and auxiliaries) with or without a main verb, the pronouns immediately follow the preverb. He did not take an explicit position on the issue of basic word order.

Chen & Lin (1985) propose that the general word order in Atayal is subject follows verb and object follows subject. Here the S and O refer to semantic subject and object.

Rau (1992) describes the word order in terms of the order of subject and predicate, an equivalent of Halliday's (1985) theme and rheme, or the topic-comment structure. The predicate normally comes before the subject in the unmarked cases. However when the subject precedes the predicate, special attention is drawn to the subject. The subject may be followed by the particle *ga* or a pause to form a topic separate from the rest of the

sentence. In other words, the often-used commentary construction in Atayal, as suggested by Egerod (1988), exhibits the form of 'as for A, (there is) B', where A is the theme, B the rheme. In a discourse analysis of Atayal narrative, Rau & Grimes (1994) claim that the basic order in Atayal is VSO, where S and O represent the typical semantic agent and patient of a transitive verb respectively. We suggest word order variation in Atayal may correlate with the referentiality and definiteness of the Os. In other words, non-referential indefinite Os generally co-occur with VOS order while referential definite Os co-occur with VSO order. Our findings support Hopper and Thompson's "high discourse transitivity" as mentioned previously.

Huang (1993) claimed VOS is the basic order of Wulai Atayal. The S refers to a semantic agent rather than a grammatical subject. She noticed a correlation between Atayal word order and its voice system. VOS order was found to generally co-occur with verbs marked by *m-/-m-* affixes whereas VSO order with verbs affixed with *–un, -an,* or *s-.* However, in a later frequency count of *m*-clauses and non-*m* clauses, Huang (1994) observed that non-*m* clauses had a higher frequency in texts than *m*-clauses and claimed that non-*m* clauses are canonical transitive clauses both syntactically and semantically. This seems to indicate she has changed her view of the canonical word order from VOS to VSO since the latter is associated with the more frequent non-*m* clauses.

2.2.2. C'uli' Atayal

Li's (1995, 1996) studies of Mayrinax and Skikun syntax claim that verbs (or predicates) generally occur in sentence initial position and are followed by the subject and the object. His S and O refer to semantic subject and object.

In their accounts of Mayrinax syntax, Mei (1994), Chang (1995), and Huang (1995) all point to the same canonical word order in Mayrinax Atayal, i.e., VOS. The S and O are no longer semantic agent and patient respectively, but rather the grammatical subject and object.

2.2.3. Seediq

Both S. Huang and Su investigated the Nakahara dialect of Seediq (i.e., Tkdaya). Huang's (1997) findings can be summarized into the following five points. First, the basic word order in Seediq is VOA. The definition of the valency roles follows Dixon (1979). A and O refer to the typical agent and patient of a transitive verb and S the single argument of an intransitive verb. Second, the preferred argument structure (PAS) in Seediq discourse appears to display what Du Bois (1987) termed one Lexical Argument Constraint and the Non-Lexical A Constraint. Third, Seediq displays ergative patterning in both grammatical and pragmatic dimensions of PAS. However, S=A links outnumber

S=O links in terms of topic continuity. Fourth, word order and focus in Seediq are interdependent and mutually predictive. The unmarked word order for Agent Focus (AF) is VOA, while that for Non-Agent Focus (NAF) is VAO. Finally, Seediq was not found to be what Cooreman, Fox and Givón (1984) termed "discourse ergative" since the measure of topic continuity did not exhibit any difference between AF and NAF.

Su (1997a) observes the word order in Seediq is VOS, or VSO when bound pronouns occur. The participant in focus is generally found in sentence-final position and the semantic roles of the participants are mostly determined by word order. Here the S refers to a grammatical subject. She (1997b) further argues that the pivots in Seediq display a grammaticization process changing the topic nominals into the subject-like ones.

Chang (1997) proposes that Seediq is a verb-initial (or predicate-initial) and subject-final language. But pronominal subjects must attach to the sentence-initial verbal elements. Again, his use of subject refers to a grammatical subject.

2.2.4. VSO, VOS or SVO?

The difference in the two proposed basic word orders, i.e., VOS vs. VSO in the Atayalic languages, on the surface seems to lie in how S and O are defined. However, when examined closely, the two views actually point to the same conclusion. If S and O refer to semantic roles of typical agent and patient in a transitive clause, the basic word order is VOS (or VOA) or VSO (or VAO). The former is the unmarked order for Agent Focus while the latter for Non-Agent Focus. Notwithstanding the word order variation, the focused element occurs in the sentence final position. If, on the other hand, S and O are defined as grammatical subject and object respectively, the canonical word order is VOS, where S is the pivot, the grammatical subject, or the focused element. In other words, the two interpretations do not really differ in predicting where the verb and the focused element occur. They both agree on the verb or predicate initial status of the language group and the sentence final position of the focused element.

Although the basic word order of Atayal has been well established, very little investigation has been conducted on the word order alternation between VS and SV, except for Rau's preliminary study (1997). In fact, the preposed topics/subjects are a common feature in not only the Atayalic languages but in Formosan languages in general (Starosta 1988). Thus the current study aims to fill in the gap by investigating the discourse factors that have a significant effect on word order variation in Atayal. S and V here refer to the grammatical subject NPs (or the focused argument) and predicate respectively.

215

3. Methodology

3.1. Research questions and hypotheses

The hypothesis tested in this paper is that word order variation (pre-verbal vs. post-verbal subject) in Atayal can be accounted for by the following factors: the information status and topic continuity of the subject, the grammatical roles (i.e., agent, patient, beneficiary, etc.) of the subject and voice alternations, nominalization of the subject derived from dependent clauses, and the gender and age of the speakers.

First, the word order variation between pre-verbal and post-verbal subject in Atayal is hypothesized to correlate with the information status and topic continuity of the subject. In terms of the information status of the subject, we would predict post-verbal subject to be expected while the preverbal subject unexpected, based on the findings of Cooreman (1992) and Hopper (1987), as discussed in 2.1. Furthermore, following Givón's hierarchy, as presented as follows in (1), the syntactic devices at the top involve topic continuity and less surprise, while those closer to the bottom involve less topic continuity and higher surprise.

(1) zero anaphora > unstressed /bound pronouns or grammatical agreement > stressed/independent pronouns > right dislocated NP's > simple definite NP's > left dislocated NP's > indefinite NP's > Y-movement > cleft/focus constructions

In other words, VS order is associated with previous mentions, paragraph medial and final, definiteness, referentiality, inexplicitness, more topicworthiness, foregrounding, and topic continuity, while the SV order is associated with first mentions, paragraph initial, indefiniteness, non-referentiality, explicitness, less topicworthiness, backgrounding, and topic discontinuity.

Second, the grammatical roles (i.e., agent, patient, beneficiary, etc.) of the subject and voice alternations (active, ergative, etc.) are correlated with word order variation. Previous studies indicate co-occurrences between VOS order and AF or active and VSO order with NAF or ergative, but no study has investigated the relationship between voice alternations and the pre-verbal S.

Third, nominalization of S derived from dependent clauses is tested for its relationship with word order variation because nominalization is sensitive to the demands of discourse, as pointed out by Hopper and Thompson (1980, 1984). Nominalization might be associated with a background rather than a foreground.

Finally, the sex and age factors are tested for preferences of word order.

3.2. Data

The data consist of 10 narrative texts of the Squliq dialect of Atayal, spoken in

Mstbon (Rui-yan in Chinese) community, in Ren'ai Village, Nantou County, Central Taiwan. The texts were tape-recorded and transcribed by Pastor Batu Temu, a native speaker of Atayal in his 30s, who was trained to do the interviews and transcribe the data. He was raised in the community and has established good relationships with the local residents. The distribution of the demographic background of the speakers is presented as follows in Table 1.

Table 1. Demographic background of the 10 speakers

Name	Sex	Age
Lawa Naway	F	82
Sayung Nawa	F	74
Temu Nakaw	M	73
Temu Syat	M	67
Temu Piling	M	66
Kumu Tusang	F	58
Walis Nabu	M	54
Abey Toci	F	45
Ciwas Nabu	F	39
Terow Sasan	M	35

The texts were divided into 22 paragraphs and 840 clauses. A paragraph boundary is determined by a change of plot, topic, location, or time. Following S. Huang (1997), the clause is defined as consisting of a verb (or predicate nominal or adjective) and its core argument NPs, but excluding oblique nominals.

All the preverbs (tense/aspect/mode markers, negators, adverbs) are coded as V, following Starosta's (1988:555) AMV (auxiliaries as main verbs) analysis and Jeng's (1997:213-281) classficiation of Bunun verbs.

Both the occurrence of S and zero anaphoras were counted. The position of zero anaphoras were coded as following the verb because all the bound pronouns occur after the verb.

Following Young & Bayley's (1996:261) coding procedure for VARBRUL, the dependent variable is coded in factor group 1, then the co-occurring contextual features are coded in factor groups 2-15. Each factor within a factor group is assigned a unique one-character identifier in parentheses. Each factor group should be orthogonal or independent from all others and all the factors in each factor group are exhaustive (Guy 1993).

3.3. Coding
    The following is a list of the analytical categories examined in this study. The

coding sheet is first presented, followed by definitions and examples from the texts to illustrate the coded categories.

3.3.1. Coding sheet

(1) Word order variation: VS (v), SV (s)

(2) First mentions: first-mentions (f), recent second mentions (s), resumptive (r), text-structure boundary (b).

(3) Position within paragraph: initial (i), medial (m), final (f).

(4) Definiteness: definite (d), indefinite (i).

(5) Referentiality: referential (r), non-referential (n).

(6) Explicitness: simple NP (i), modified NP (e), zero (z).

(7) Topicworthiness: first person pronoun (f), second person pronoun (s), third person pronoun (t), proper name (p), human NP (h), non-human animate NP (a), inanimate NP (i).

(8) Temporal sequencing: background (b), foreground (f).

(9) Topic particle in SV clauses: ga (g), none (n), non-applicable (/).

(10) Gender: male (m), female (f).

(11) Age: 30's (a), 40's (b), 50's (c), 60's (d), 70's (e), 80's (f).

(12) Nominalization of S derived from dependent clauses: yes (y), no (n).

(13) Grammatical roles of S: Agent (a), Patient (p), Beneficiary (b), Locative (l), Instrumental (i), Conveyance (c).

(14) Pronouns: free personal pronoun (f), bound personal pronoun (b), demonstrative pronoun (d), interrogative pronoun (i), zero (z), non-applicable (/).

(15) Voice alternations: active (a), antipassive (t), ergative (e).

3.3.2. Analytical categories: definitions and examples[2]

(1) Word order variation

S can occur after the verb, such as "I" and "the fire" in (1a), or before the verb, such as "my father" and "my mother" in (1b).

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[2] Abbreviations:

1PGEX=first person plural genitive exclusive, 1PGIN=first person plural genitive inclusive, 1PG=first person genitive, 1SD=first person singular dative, 1SG=first person singular genitive exclusive, 1PNEX=first person plural nominative exclusive, 1SN=first person singular nominative, 1SNF=first person singular nominative free, 1SD=first person singular dative, 2SG=second person singular genitive, 3SD=third person singular dative, 3SG=third person singular genitive, 3SNF=third person singular nominative free, AF=agent focus, ASP=aspect, BF=benefactive focus, CF=conveyance focus, CON=conjunction, FUT=future, GEN=genitive marker, IF=instrument focus, IRR=irrealis, LF=locative focus, NEG=negation, NOM=nominative, PAR=particle, PERF=perfective, PF=patient focus, PN=personal name, TOP=topicalization.

(1a) m'abi saku ru ini muyan ktay puneq qasa ru,

AF-sleep 1SN CON NEG 1PGEX see-LF fire that CON

"I fell asleep and did not see the fire."

(1b) yaba maku ga wan mhoqin cipoq saku na.

father 1SG TOP PERF AF-die small 1SN yet

"My father died when I was still young."

(2) First mentions

S is coded as "first-mention" if it has not been mentioned previously in the discourse, "recent second mention" when S has been mentioned in the previous clause in the discourse, "resumptive" when S is being reintroduced into the discourse after a lapse, or "text-structure boundary" when S has been mentioned in the previous discourse, but a paragraph boundary intervenes since the prior mention.

In the following example (2a), first person singular pronoun "I" is illustrated in terms of its coding. The free nominative form *kuzing* is coded as "first mention" at the beginning of the narrative in (1). The short bound nominative *ku* is coded as "recent second mention" in (2). After a paragraph boundary, the long bound nominative form *saku* is coded as "text-structure boundary". After a lapse, the long bound nominative form *saku* is coded as "resumptive" in (9) when the S is reintroduced into the discourse. Finally, the short bound nominative *ku* is again coded as "recent second mention". The occurrences of short vs. long forms seem to follow the principle of iconicity. The short form encodes inexplicitness and recent second mention while the long form explicitness, first mentions, and reintroduction into the discourse.

(2a) (1) kuzing hiya ga lalu maku ga Temu Nakaw.

1SNF 3SNF TOP name 1SG TOP PN

"I, my name is Temu Nakaw."

(2) yaba ku na Batu Bokusi.

Father 1SN GEN PN Pastor

"I am Pastor Batu's father."

(3) ru kawas maku hiya ga pitu pgan ciwan.

CON age i3G 3SNF TOP seven ten three

"I am 73 years of age."

[Clauses 4-6, Paragraph boundary]

(7) nwah saku smi rusa nxan,

PERF.AF-go 1SN AF-put trap life

"In the old days, I went to set traps."

(8) ru pitu bingi lga, say ta mlaw,

CON seven day PAR go-LF.IRR 1PG AF-check

"After seven days, we were going to check (it)."

(9) mha saku.

Thus 1SN

"I did that."

(10) mtuleq ku sasan,

AF-rise 1SN morning

"I rose in the morning."

[...]

(3) Position within paragraph

S may occur in the paragraph initially, medially, or finally.

(4) Definiteness

S may be definite or indefinite depending on whether it is identifiable to the hearer. In Atayal, nouns preceded by *qutux* "one" or without any determiners are coded "indefinite".

(5) Referentiality

S may be referential or non-referential depending on whether it is identifiable to the speaker.

(6) Explicitness

S may be coded as a simple NP, as *qulih* "fish", modified NP, as *qulih raran* "fish in the past", *qulih misuw qani hiya* "fish nowadays", or zero.

(7) Topicworthiness

The term "topicworthiness" is equivalent to what typologists used to call "animacy"[3]. Our categories correspond with Silverstein's Animacy Hierarchy (1976), except that the kin term is grouped with the human NP instead of proper names[4]. S may occur as first person pronoun, second person pronoun, third person pronoun, proper name, human NP, non-human animate NP, or inanimate NP.

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[3] Whaley (1997) suggests that "animacy" is a misnomer because it is only one of the parameters that are reflected in the so called "Animacy Hierarchy". The other parameters are sociocentric orientation, empathy, and definiteness.

[4] The result of the pilot study indicated that proper names might be associated with SV order. Therefore, proper names were separated as a factor to be tested in this study.

(8) Temporal sequencing

S may occur in foregrounded or backgrounded clauses. Foregrounding refers to the thread or backbone of the discourse, which is ordered in temporal sequence and frequently associated with non-agent focus, whereas backgrounding refers to the clauses that merely assist, amplify, or comment on the speaker's goal and are not ordered with respect to each other, frequently associated with agent focus.

(9) Topic particle in SV clauses

S is marked with a special particle *ga* for topicalization, reserved for pre-predicate elements, as in (1b) and (2a-1), or none, as *yaya nanak* "only my mother" without the following topicalizer *ga* in (9a).

(9a) trang cipok myan ga[5], uka qa yaba, <u>yaya nanak</u> maki.

when small 1SG PAR   no that father mother only AF-exist

"From my childhood, I had no father.   <u>Only my mother</u> was alive."

In SV order, S may be an L-dislocated NP or a Y-moved NP.   In the L-dislocation construction, S precedes a complete clause, with a pronominal element cross-referencing S in the clause, as in (9b).   In the Y-movement construction, on the other hand, S precedes a predicate, without a pronominal element cross-referencing S in the predicate, as in (9c).

(9b) maki qutux ryax,

AF-exist one day

<u>sami yangu mu</u>,   nwah <u>myan</u>[6] sbayux tmubux pagay.

1PNEX younger brother's wife 1SG PERF.AF-go 1PGEX share AF-plant rice

"One day, <u>my younger brother's wife and I, we</u> went to share the work in rice planting."

(9c) <u>yaqa yaya</u> anay uku mpanga.

that female let-LF.IRR 1SG AF-carry

"<u>That female (pig)</u>, let me carry."

(10) Gender

The 10 speakers were equally divided between males and females.

(11) Age

The 10 speakers were divided into six age groups: 30's, 40's, 50's, 60's, 70's, 80's.

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[5] This is a homophonous particle *ga* meaning "when, after", functioning as a conjunction for adverbial clause.
[6] The S is treated the same way as A and differently as O in discourse.

(12) Nominalization of S derived from dependent clauses

S may occur in nominalized construction derived from dependent clauses, as in (12a).

(12a) cipok alay qu miyuk uzi qa qoqoq qga,

  Small very NOM AF-enter also that spear that-PAR

  "The stabbing of the spear was not deep either."

(13) Grammatical roles of S

The grammatical roles of S may be either Agent (13a), Patient (13b), Beneficiary (13c), Locative (13d), Instrumental (13e), or Conveyance (13f).

(13a) ru ana ga ulung su gmalu utux kayan.

  CON but PAR fortunate 2SG AF-bestow god heaven

  "But fortunately the Heavenly God bestowed grace."

(13b) qlngun ku nya ptehuk qalang.

  support-PF 1SN 3SG FUT-arrive village

  "He supported me to get home."

(13c) hazi ku nya sgalu uzi.

  maybe 1SN 3SG BF-bestow also

  "Maybe He bestowed grace to me."

(13d) biqan ku nya kinlokah.

  give-LF 1SN 3SG strength

  "He gave me strength."

(13e) ciwan sbiq maku hiyan.

  three IF-give 1SG 3SD

  "I gave him three (fish)."

(13f) ana ga cyux ku nya snaga kraya.

  but PAR ASP 1SN 3SG CF-wait above

  "But he was awaiting me above."

(14) Pronouns

Pronouns are coded as free personal pronoun, bound personal pronoun, demonstrative pronoun, interrogative pronoun, or zero. The categorization of pronouns were constructed to test Givón's scale of topic continuity (Givón, 1983a:17).

The system of personal pronouns in Atayal is presented in Table 2 (cf. Rau 1992, and Huang 1993).

222

Table 2. Atayal Pronominal System

Person/Number	Bound		Free	
	Nominative	Genitive	Dative	Nominative
1S	saku~ku	maku~mu~amu ~aku~uku	knan	kuzing~kun
2S	su	su	sunan	isu
3S	hiya	nya	hiyan	hiya
1P (inclusive)	ta	ta	itan	ita
1P (exclusive)	sami	myan~muyan	sminan	sami
2P	simu	mamu	smunan	simu
3P	hga~lhga	nha	hgan	hga~lhga
1SG+2SN=	misu			

The following examples illustrate interrogative pronouns (14a), demonstrative pronouns (14b), and zero (14c).

(14a) son ta nanu la?
    go-PF 1PGIN what PAR
    "What are we going to do?"

(14b) qani ga ciriqan nanu yaba su.
    here TOP catch-LP what father 1SG
    "Here is what your father caught."

(14c) nyux mtakuy ru nyux mu sr'un ra.
    ASP AF-fall CON ASP 1SG hold down-PF PAR
    "After (it) fell, I was holding (it) down."

(15) Voice alternations: active (a), antipassive (t), ergative (e).

    S may occur in active constructions, including one-argument intransitive clause (13a), existential sentence (15a), equational sentence (15b), and adjectival predicates (15c), antipassive constructions (15d), or ergative constructions, including patient focus (13b), benefactive focus (13c), locative focus (13d), instrumental focus (13e), and conveyance focus (13f).

(15a) ru yasa qa   uka yaba mu la.
    CON therefore that no father 1SG PAR
    "Therefore, I have no father."

(15b) lalu maku ga Lawa Naway.
    Name 1SG TOP PN
    "My name is Lawa Naway."

(15c) yaqih balay qnxan myan.
    bad very life 1PGEX
    "Our life was very difficult."

(15d) yaya maku qutux lmanga knan.
    Mother 1SG one AF-raise 1SD
    "My mother raised me as a single parent."

4. Results and discussion

4.1. An initial VARBRUL run

In this section, we simply present the results of the preliminary run. Detailed discussions on the final results are deferred to the next section on recodings and subsequent runs.

Our initial VARBRUL run shows the VS order (750/840, or 89%) is the unmarked word order. Ergative or non-agent focus (36%) occurs more frequently than anti-passive (13%). But the active construction (including one-argument agent focus, existential sentences, equational sentences, and adjectival predicates) is more frequent than either the ergative or the anti-passive construction, constituting 50% of all the voice alternations.

VS order seems to be associated with previous mentions, paragraph medial and final positions, definiteness, referentiality, inexplicitness, more topicworthiness, foregrounding, and topic continuity, if we compare all the percentages of the factors affecting VS order in each factor group. The factors with the highest percentages associated with VS order are recent second mentions (97%), paragraph medial position (90%), definite (91%), referential (91%), simple NPs (94%), no nominalization of S (89%), first person (96%), foregrounding (93%), and bound personal pronoun (100%).

On the other hand, SV order seems to be associated with first mentions, paragraph initial, indefiniteness, non-referentiality, explicitness, less topicworthiness, backgrounding, and topic discontinuity, if we compare all the percentages of the factors affecting SV order in each factor group. The factors with the highest percentages associated with SV order are text-structure boundary (42%), first mentions (35%), paragraph initial position (52%), indefinite (26%), non-referential (27%), modified NP (26%), nominalization of S (14%), inanimate NP (21%), backgrounding (17%), and free personal pronoun (59%).

In terms of social factors, male speakers (91%) seem to have a preference for VS order while female speakers (16%) seem to have a preference for SV order. The oldest group has a preference for SV order, but this number is based only on the speech of one female speaker in her 80's.

However, our quantitative analysis certainly does not stop here because a closer look reveals that only paragraph initial position and independence of personal pronoun indicate

slightly higher percentages of SV order than VS order. Besides, the knockout factors have to be recoded, and the independence of the factor groups and the information on goodness-of-fit have to be determined before the results can be interpreted. Thus the factors were recoded for subsequent VARBRUL runs.

4.2. Recoding

Several recodings and subsequent VARBRUL runs have brought us to recode our factor groups as follows:

(1) Word order variation: VS (v), SV (s).

(2) First mentions: first mentions (f), recent second mentions (s), resumptive (r), text-structure boundary (b).

(3) Explicitness: modified NP (m), simple NP and zero (s).

(4) Pronouns: zero and bound personal pronoun (b), free personal pronoun (f), demonstrative pronoun (d), interrogative pronoun (i), non-applicable (/).

4.3. One-level binomial analysis

The results of the one-level binomial analysis are shown in Tables 3.

Table 3. VARBRUL output: Input probability and group factor weight

Input probability: 0.81, Application of the rule: VS order		
Group	Factor	Weight
(1) First mentions	First mentions	0.43
	Recent second mentions	0.80
	Resumptive	0.73
	Text-structure boundary	0.11
(2) Explicitness	Modified NPs	0.39
	Simple NPs and zero	0.61
(3) Pronouns	Bound personal and zero	0.97
	Free personal	0.06
	Demonstrative	0.26
	Interrogative	0.59

The input probability, that is the likelihood that the post-verbal rule (VS order) will operate irrespective of conditioning factors, is 0.81. First mentions, explicitness and independence of the pronouns are the three factor groups that affect word order variation in Atayal. In terms of first mentions, recent second mentions (0.80) and resumptive (0.73) favor VS order, while first mentions (0.43) and text-structure boundary (0.11) favor SV order. As for explicitness, simple NPs and zero (0.61) favor VS order, whereas modified NPs (0.39) favor SV order. Finally, in terms of the independence of the pronouns, bound

personal pronouns and zero (0.97) and interrogative (0.59) favor VS order, while free personal pronouns (0.06) and demonstrative pronouns (0.26) favor SV order. The results indicate that information status of the S and topic continuity affect word order variation in Atayal.

The three factor groups and all the factors are independent because the error values are mostly below 1.5, the total Chi-square value (5.1041) is within the limit (6.490), and the Chi-square per cell figure (0.2686) is also very low. The result of the Chi-square test indicates goodness-of-fit and the least likelihood that interaction exist among factors.

4.4. Step-up/step-down binomial analysis

A step-up/step-down binomial analysis was conducted to test whether all the three factor groups in the last run contribute to the observed pattern of variation. The probability level is 0.05. The best stepping up and stepping down runs selected all three factor groups. In other words, first mentions, explicitness, and independence of pronouns have significant effect on word order variation in Atayal.

4.5. Discussion

Our hypothesis that word order variation is affected by the information status and topic continuity of the subject is supported. First mentions, explicitness, and independence of pronouns have significant effect on word order variation in Atayal. Recent second mentions, resumptives, simple NPs, bound personal pronouns, zeroes, and interrogative pronouns favor the VS order whereas text-structural boundary, first mentions, modified NPs, free pronouns, and demonstrative pronouns favor the SV order.

The fact that interrogative pronouns occur more frequently in VS order needs explanation. In WH-questions, the interrogative pronouns functioning as subject in action-oriented clauses do not change order, as illustrated in (4-1), (4-2).

(4-1) son ta nanu la?
    go-PF 1PG what PAR
    "We are going to do what ?"
(4-2) kutan inu, mama?
    cut-LF where uncle
    "Cut where, uncle?"

The interrogative pronouns occur pre-verbally in cleft/focus construction or state-oriented clauses, such as (4-3).

(4-3) nanu nyux su niqun, Temu?
    what ASP 2SG eat-PF PN
    "What is it that you are eating, Temu?"

Factors that were not found to have any significant effect on the choice of VS or SV include position within paragraph, definiteness, referentiality, topicworthiness, temporal sequencing, grammatical roles, voice alternations, nominalization of the subject, and social factors of gender and age. However, the division of paragraphs, the assignment of definiteness, and the decision on foregrounding and backgrounding are yet to be worked out in a more objective way.

5. Conclusion

The study confirms that word order variation is associated with the information status and topic continuity of the Subject. VS order is associated with old information and topic continuity while SV order is associated with new information and topic discontinuity. In particular, recent second mentions, resumptives, simple NPs, bound personal pronouns, zeroes, and interrogative pronouns favor the VS order whereas text-structural boundary, first mentions, modified NPs, free pronouns, and demonstrative pronouns favor the SV order.

By using a multivariate analysis, GoldVarb 2.0, to distinguish the truly important factors from the minor ones and remove interactions among factors in the design, this study addressed the problems that previous studies of word order variation based on text counts have generally failed to do.

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228

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AUSTRONESIAN FEATURES IN A LINGUISTIC AREA

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Linguistic areas are, in general, defined by diffused traits shared by languages belonging to more than one, more or less well-defined (genetic) family (see, among many others, Campbell 1998). In the New Guinea area (including adjacent islands) a distinction is made between Austronesian (AN) and Non-Austronesian (NAN) languages. The latter are often referred to as Papuan, without any implication regarding their genetic homogeneity (Foley 1986), but sometimes lists of characteristic featues are given (e.g. Wurm et al. 1975; Foley 1998).

The NAN languages of the Bird's Head peninsula and Halmahera in the Indonesian provinces Papua (Irian Jaya) and Maluku do not show many of the typical Papuan traits (Reesink 1996, 1998). Are they perhaps Austronesian? Framing the question thus would lead us on a search for "platonic essences" which may not be available, when virtually all features are "negotiable and contestable" in an area with centuries-old contacts (Foley 1998:515-16). But, in order "to sort out more clearly the typological vs. genetic affiliations in the large Papuan-Austronesian Sprachbund" (Bradshaw 1998), it would be helpful to determine the origin of the shared features. I will try to determine the essential origin of a few features present in Biak and some other AN languages in the area, which are also found in (some of) what I call West Papuan languages. Notice that for the purpose of this paper I do not focus on the distinction between the AN families CMP and SHWNG, nor do I intend any commitment to the existence of a genetic grouping called West Papuan Phylum. For the time being, it is enough to assume a genetic relationship for what we call Austronesian, based on extensive cognate sets between the languages thus defined, while a possible overall genetic relationship between West Papuan languages remains to be proven. The term Papuan, then, I use rather loosely to refer to the NAN languages of the area.

This paper will discuss the spread of a few basically AN traits, of which two are mainly syntactic: (i) SVO word order; (ii) the N+G order for possessive constructions; (iii) one is morphosyntactic: the Inclusive-Exclusive opposition for first person plural; (iv) one is a morphophonological feature: *Ca(C)*-reduplication to form an Instrument-like noun from a verb (Blust 1998). Conversely, two semantico-syntactic features, which are arguably Non-Austronesian, will be considered: (v) morphological form and syntactic position of the negative, and (vi) the function of two verbal adjuncts, which change the meaning (and sometimes valency) of the main verb.

1. Constituent order

The West Papuan languages have for the most part an SVO order, which is quite unusual for Papuan languages. The only other group with this feature are the Torricelli languages. As Voorhoeve (1994:656) points out, this order is most likely due to the influence of neighboring AN languages. We assume that originally the West Papuan languages all had the 'canonical' Papuan order SOV, because this is still present in the Northeast Halmahera languages. An independent spontaneous switch from SVO to SOV

order is not likely, as also Voorhoeve reasoned. Although there are many cases of AN languages that have adopted an SOV order and a distinction between medial and final verbs, such as Takia (Ross 1993), or even a switch-reference mechanism, as is claimed for Dami (Roberts 1997:192), there are no neighboring languages from which North Halmahera languages could have borrowed this order.

On the Bird's Head, the southern Bird's Head languages (claimed to belong to the Trans New Guinea Phylum) maintain the canonical Papuan SOV order, even though these languages exhibit yet another aberrant feature, subject and object prefixes on the verb. This is shared with Marind languages to the east and North Halmahera to the west.

Neither the SOV order, nor the object prefixes are very stable features in the Halmahera languages. The languages on the small islands west of Halmahera and the west coast of the main island have had the most contact with AN speakers for many centuries. This contact has apparently been instrumental in the erosion of object prefixes in Ternate, Tidore and West-Makian, while these languages, plus Sahu on the west coast have adopted the SVO order. Similarly, in the south Bird's Head languages, the SOV order is leaking to an SVO order, as some examples of Inanwatan suggest (De Vries 1996:120-121).

Thus, we assume that West Papuan languages originally had the canonical Papuan SOV order, and that most of these languages have changed their basic order under influence from contact with AN languages. Whether the other languages of the Bird's Head ever had object prefixes is doubtful, but possible, given the attested erosion in some of the North-Hamahera languages.

2. Possessive construction

The so-called 'reversed genitive' has long been discussed as a possible diagnostic for the nature of the languages in the area (Van der Veen 1915:92; Voorhoeve 1994:658; Discussion on the AN-LANG site, May 1998). I am not advocating that G+N order can be used to make any statement about the nature of a language. I do think, though, that in the linguistic area under discussion, the spread of possessive orders says something about language contact and diffusion in one direction or the other. It seems significant that a language like Biak has only postnominal possessors, both for inalienable and alienable possession. The possessive pronouns in Biak are rather complex (see also Van Hasselt 1905), indicating number and gender (animate-inanimate; only for plural) of the possessed, as in (1). Only body-part terms and some kinship terms seem to have remnants of AN possessive suffixes, as in (2). The *b* in 2SG form is phonetic.

(1) *inokən ai-di-ne*   *fno*   *ai-ja*
    bag   1SG-POS-this   si.ch 1SG-POS
    'my bag'   'my sister's child'

    inokən ai-su-ine   *fno*   *ai-e-su(-ya)*
    bag   1SG-DU-this   si.ch 1SG-POS-DU-TOP
    my two bags   my two nephews/nieces

    inokən ai-na-ne   *fno*   *ai-e-si(-ya)*
    bag   1SG-PL-this   si.ch 1SG-POS-PL-TOP

my bags   my nephews/nieces (my sister's children)

(2) *bru-ri*   *sna-ri*
      head.3SG-ART   mother.3SG-ART
      my/his/her head   my/his/her mother

      bru-m(b)-ri   *sna-m(b)-ri*
      head-2SG-ART   mother-2SG-ART
      your head   your mother

The suffix *ri* on singular body-part and kinship terms (body-parts which always come in pairs do not have *ri*, but *si*, as *mgasi* 'my, his, her eye(s)', *mga-m-si* 'your eye(s)'), which I gloss as article, seems to have some connection with the possessive marker in other AN languages of the area. Waropen distinguishes factual possession and expected possession (Held 1942:46-46; 119-124). The first notion employs *-(r)i*: *ra-i* '1SG-POS', *a-ri* '2SG-POS', *(i)-ri* '3SG-POS', etc., the second is expressed by *-na*: *ra-na* '1SG-POS', *a-na* '2SG-POS', *(i)-na* '3SG-POS', etc., so that a subtle difference can be expressed, as in (3).

(3)a. *Ra-wu*   *ra-na*   *bin-o*
      1SG-take   1SG-POS woman-CLIT.
      I take a wife (the woman still has to become mine)

(3)b *Ra-wu*   *ra-i-bin-gha*
      1SG-take   1SG-POS-woman-ART
      I took a wife (she has already become my wife) (Held 1942:121)

Just as Waropen, other (genetic) relatives Taba (Bowden 1998:271-282) and Wandamen contrast with Biak in that they have prenominal possessors, although in Wandamen (or Windesi) "[...] sometimes we also find the normal Austronesian order, e.g. *anio Marani-pasiat* 'the house of the Maranis'; *rawa-tawai-pai* 'the snake's skin' (*rawa* = 'skin')" (Cowan 1955:47). This alternative AN order is not given in the Wandamen phrase book (Ramar et al. 1983:27):

(4) *Yohan nie*   *anio*   *wai*
    John his   house a
    John's house.

Compare this with postnominal clitics on inalienable nouns, and preposed clitics on alienable nouns in Bandanese (Collins & Kaartinen 1998:535) and other CMP languages.

Now, in the majority of the West Papuan languages the regular order is: possessor prefix on inalienables and pre-nominal possessor + possessive pronoun for alienables. In a language like Maybrat (5) the inalienable pattern is maintained, but the alienable possession is modeled after the post-nominal AN construction (not necessarily implying this comes directly from Biak):

(5) *Tfo*   *ro-Yan*   *y-atia*
    machete POS-Yan 3SG.M-father

Yan's father's knife. (Dol 1999:151)

In Hatam both pre- and post-nominal possessors are possible on alienable nouns, that is, both are attested in unelicited narrative material, (6) and (7). Inalienable possession is always expressed by means of a prefix, as in *di-cig* '1SG-father', *a-cig* '2SG-father', etc.

(6) *Munggwom   ji-de-nya*
    child   2PL-POS-PL
    Your children.

(7) *Nyen-de   andigpoi-nya*
    1PL-POS   old.man-PL
    Our parents.

There are both so-called Papuan, as Hatam, and AN languages, as Mor (Laycock 1978:300), that allow both orders. These facts suggest that G+N is basically a Papuan feature, and that its presence in a language which has an overwhelming AN nature is due to diffusion. Conversely, N+G is basically an AN feature and its presence in a language which is Papuan equally suggests the result of language contact.

3. Inclusive-Exclusive opposition

The inclusive-exclusive opposition for first person plural (and dual) pronouns is a rather stable AN feature. It yields a global cline, showing complete absence in the far west (Europe, Africa) and nearly 100% presence in the far east (Australia). I am not sure which of Nichols' three interpretations (Nichols 1992:278) will turn out to be the correct one: (i) the lack originated in the far west and spread to the east, reached New Guinea but not Australia; (ii) the diversity tree: the Australia-New Guinea discontinuity goes back to second stage: the upper Paleolithic and Mesolithic time of circum-Pacific spread and differentiation; (iii) zero frequency in the far west and 100% frequency in Australia, both result from initial frequencies of 50%. (ii) and (iii) are mutually compatible (p. 279).

The lack of this opposition can be said to be 100% in New Guinea. The only Papuan languages which do employ the distinction are those adjacent to more recently arrived AN languages (about 4.000 BP). Conversely, there are a few AN languages in New Guinea which have discarded the opposition (Ross 1988:131), presumably due to Papuan contact, I think.

It would appear then, that in the area of the Moluccas and New Guinea (specifically the Bird's Head), the I/E opposition is clearly of AN origin and it has dispersed to (West) Papuan languages through contact. All the West Papuan languages have a clear I/E opposition, except the three more centrally located languages in the Bird's Head, Maybrat, Abun and Mpur. Hatam seems to make the distinction in verbal (and inalienable nominal) prefixation: the 3SG prefix is used for exclusive, the 3PL for inclusive, but no opposition is found in the free pronouns. In contrast, adjacent languages Meyah and Sougb, as well as the western languages, such as Moi and Tehit, exhibit the opposition wherever it is feasible, including the very robust dual paradigm.

4. *Ca(C)*- reduplication

In his survey of Ca- reduplication in AN languages, Blust (1998:49) raises the question whether the CaC- template in Taba (Bowden 1998:91-94; 207) and similar facts in South Halmahera language are perhaps products of an independent history, and not related to the proposed Proto-Austronesian pattern of deriving instrumental nouns from verbs. Whatever the outcome of this question, it seems rather safe to claim that Ca(C)- reduplication is a strong diagnostic for Austronesian languages. Blust (1998:50) admits that the semantic function of Ca- reduplication is not always unequivocally instrumental. And Bowden (1998:94) recognizes a 'plurality of action' as a second function in Taba, for forms such as *K-sang-sung um* '1SG-RED-enter house' meaning 'I entered many houses'. Although a thorough analysis of similar forms in Biak is not yet possible, it seems that it behaves somewhat like its relative Taba. A number of CaC-CVC items can be found in Van Hasselt's Numfor dictionary (1947), at least one of which can be interpreted as instrumental, *kankun* 'fireplace' from *kun* 'burn, cook'. Others are not so clear: *bisər* 'to be hungry' and *bas-bisər* 'famine'. Yet others fall more easily in the categpry of 'plurality of action' or agree with the general intensifying function of any reduplication in many languages: *kenəm* 'to live' > *kan-kenəm* 'life', or *i-kan-kun* '3SG-RED-cook' from *kun* 'cook, burn', which my informant translated as 'she is cooking' (*dia sedang masak*). From Lex van der Leeden I have the information that the ubiquitous Bird's Head word for 'clothing' *sansun* (or [səsun], [sasun] etc. depending on the individual language) originate in Ma'ya, the AN language of Salawati, where the verb *sun* means 'to enter' (also present in Biak for *or i-s-i-un* 'sun 3SG-goes in' = 'the sun is going down').

From a Wandamen wordlist (Henning et al. 1991) I have extracted only one possible example, *saso* 'bellows' from *so* 'to blow', which is also found in Waropen (Held's dictionary gives *so* 'blow' and *saso-ri* 'bellows').

A similar pattern is found in other AN languages of the region, like Ambai (Silzer 1983), where not only *a*, but also other vowels, *e* and *i* are used, and Keiese (Geurtjens 1921). The latter does have Ci(C)-, rather than CaC-, for intensification: *sa* 'wrong' > *si-sa* 'very wrong'; *waruk* 'sprinkle' > *wir-waruk* 'squander, waste'. Geurtjens (p. 47) claims that if the stem vowel is *i*, the reduplicated form contains *a* and follows: *wil* 'move' > *wil-wal* 'move all the time'; but this seems rather unlikely.

Biak seems to use another template as well: $C^1C^2 V... > C^1$-a C^2a- $C^2V...$, as in: *frur* 'to make' > *f-ara-rur* 'work' (as verb and as noun); and possibly *f-aya-yer* 'dance' from *fyer* 'dancing of women, similar to the scratching of chickens' (Van Hasselt 1947:84-85; verb used in Luk15:25); *mkak* 'to fear' > *m-aka-kak* 'fear'; *pyar* 'float' > *p-aya-yar* 'anchoring place' (Hasselt 1947:173). Ambai has a variant: *fobera* 'to pull' > *fo-ba-bera* 'to keep pulling'; *mirisin* 'to be happy' > *mi-ra-risin* 'to be very happy' (Silzer 1983:58). These variants are probably due to some interaction with fossilized prefixes.

It seems likely that more focussed research would turn up more instances of Ca(C)-reduplications in the AN languages of the area, some with instrumental meaning, others with general durative intensification of the basic event.

No such reduplication template is present in any of the (West-)Papuan languages, with one possible exception. Tidore (Van Staden 2000) has a similar reduplication in which the vowel is either a copy of the stem vowel or *o* rather than the invariant *a*, noted by Blust. Possibly, Tidore has adopted this feature, as there are many other signs for heavy AN

influence, due to its and Ternate's prolonged exposure to AN speakers, far more than is the case for other North Halmahera languages.

5. Form and position of negative adverb

The canonical place of the negative adverb is pre-predicate, both in SVO AN languages, like Tetun (Van Klinken 1999:228), Leti (Van Engelenhoven 1995:213), and in SOV Papuan languages, where the consequence of negation is often a total or partial reduction of person-number and tense categories of the verbal inflection, as in Sentani (Cowan 1965:22; Hartzler 1994).

The behavior of the negative in the West Papuan languages and the AN languages in this area is quite different. In all these languages the position of the negative adverb is rather strictly clause-final, or at least post-predicate in a language such as Moi, where it may move thrugh the clause, if its scope needs to be narrowed. Even its actual phonemic form is quite wide-spread throughout the area. It is *βa* in Mor (Laycock 1978:300)[1], Wandamen, Biak and *(u)wa* in North Halmahera languages (Van der Veen 1915:98), and *wo(mo)* in one dialect of Waropen, while the Napan dialect has *te* (Held 1942: 80). As just one example, consider the Biak sentence in (8), in which the first word no doubt contains the negative element as well: *βa-pe* 'not-?' = 'but'.

(8) *βape   w-ak-βuk   neknek   mkun   oso   fa*
    but   2SG-with-give   goat   young one   for

   ya-βuk-i   d-ak-marisen   kuker maniβoβ ay-e-si   βa
   1SG-give-3SG   3SG-with-happy with with   friend   1SG-POS-PL   not
   But you have not given me a young goat that I (could) give it and have fun with my friends.

The West Papuan languages Mansim and related Hatam have a regular sound correspondence word-final *–ar* in Mansim and *–ig* in Hatam, attested in the negative adverbs *bar* and *big*, respectively. None of the other West Papuan languages have this form. West-Bird's Head Moi *dau* might be related through metathesis and additional *d-*, but clearly Maybrat *fe*, Abun *nde*, Mpur *jan*, Meyah *guru*, Sougb *ero* are not. Nor is AN Ambai *kaka* 'not' related; this seems more a reduplicated reflex of PAN *ta*.

It is perhaps significant that Abun has a pre-predicate negative element as well, which is *yo*. It is tempting to relate these two items to the negative adverbs, divided over the two languages of Makian: *nde* = *te* in the Austronesian Taba and *yo* = *yo* in Papuan West-Makian (with its endonym Moi). Notice, that just as *βa*, the form *te* is found in both AN and West Papuan languages, the latter presumably a reflex of PAN *ta*.

Which direction the diffusion of the basic form *ba~βa~wa* has taken is not easily determined. My hypothesis is that it is 'originally' West Papuan, and that Biak,

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[1] Laycock p. 289 mentions that /β/ definitely contrasts with /w/, but that these sounds are often difficult to distinguish; while [b] only seems to occur following a bilabial nasal. Similarly, in Biak β, w. and b seem to contrast but in many contexts they fluctuate, as in the orthography of the Biak NT.

Wandamen, Mor have borrowed the form from Mansim, the original language along the coast around Manokwari, and/or Tidore.

In most Papuan languages the negative occurs in pre-predicate position on the last verb of a sentence. Some Papuan languages have a sentence-final negative with different semantic import from the canonical pre-predicate one. For example, Sentani has, in addition to to the verbal negator which is *ə* or homorganic vowel preceding the verb stem plus postclitic *i* on a verb stem devoid of any tense/person-number suffix, the form *ban* to negate non-verbal material. But this can operate on a clause with a fully inflected final verb, as in (9), which Hartzler (1994:59) characterizes as 'psychological negation': 'but there is just this small thing'. I would interpret this sentence as conveying 'it is not the case that I intend for you to do something for me', parallel to the non-verbal negation of (10), meaning 'It is not a true word'.

(9) *Rabuhi-re   mokonsele-re   ban*
   something-to   you:will:do:for:me-purpose   not
   I don't intend for you to do anything for me [but there is just this one small thing...]

(10) *A   hele   ban*
    word   true   not
    It's not true, untrue word.

Perhaps, the clause-final negatives in Dani (and related languages) may suggest that it is an alternative strategy of Papuan languages. In these languages, the negative does not need to be sentence-finally, but it is always post-predicate, as in:

(11) *At-en   wam   waty'*   *lek*
    3s-by   pig   hit.Iterative.participle   not
    He did not kill a/the pig. (Bromley, p.c.)

(12) *i...   nykky'   lek   lakeikhatek*
    water consuming not   they.normally.go
    They travel without drinking. (Bromley 1981:250)

The strict clause-final position is an innovation of the languages of Maluku and the Bird's Head. Strictly clause-final negative adverbs are typologically highly unusual (Horn 1989:447-462).[2] It cannot easily be traced to either AN or Papuan languages outside this area. It seems safe to say that it is linked closer to Papuan than to Austronesian languages, just as the 'reversed genitive' is due to Papuan influence on the later arrived AN languages.

6. Verbal adjuncts

A rather striking feature of eastern Bird's Head languages is the behavior of two adverbial adjuncts, which intensify the action expressed by the verb and/or increase its valence. The semantic function of these adjuncts is not easily captured. They appear to

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[2] Payne (1985:226) notes that a few Chadic languages have solely a final negative marker in a similar configuration of S-V-O-Neg.

follow immediately the main verb but in some cases a nominal object may intervene. What is of interest here is the striking similarity, not only in function, but also in some instances in actual form, of two Biak elements. So far, I am not aware of equivalents in other AN languages, and thus, until such evidence shows up, my hypothesis is that Biak has adopted such constructions from the languages of the eastern Bird's Head. Let me first illustrate the adjunct that means something like 'press' or 'hold onto with force', which may express a durative aspect in Hatam (13) and Sougb (14). The actual forms are[3]:

Meyah	*keingg*
Sougb	*deb(-in)*
Hatam	*kep*
Biak	*epən*

(13) *Noni coi kep dimbou dini*
s/he enter keep.onto door this
S/he always enters this door.

(14) *Dan d-eigtou deb*
I 1SG-sit keep.onto
I'm sitting

The meaning of 'press, with force' is possible in conjunction with other verbs in Hatam and Sougb. It is illustrated by Meyah (15) and Biak (16). My informant gave *yaref epen* in (16) as the involuntary analog of the voluntary *y-ores epen* 'I-stand onto' which he explained as 'saya berdiri dan tindis' = 'I trample on'

(15) *Esin keingg anggur efek*
poke onto grape juice
Smash/squeeze grape.

(16) *Y-aref epən mangkoko kapu*
1SG-step onto chicken shit
I stepped in chicken shit

The other adjunct is even more difficult to translate. It is invariably translated by the Malay term *pele*, which means something like 'block, screen, shield off', and which in conjunction with a position verb like 'stand' means 'guard' or 'protect', as Meyah *Ot joug efesa* 's/he guards his/her child'. The forms of this adjunct in the four languages are:

Meyah:	*joug*
Sougb:	*dougwo*
Hatam:	*ser*
Biak:	*user*

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[3] For further data on Hatam, see Reesink (1999); on Meyah, see Gravelle (1998). Sougb and Meyah are also presented in Reesink (to appear).

The Biak item is given in isolation is given as [usɛr], but in context it gets reduced to [usər] or [us], the latter form being the one given for Numfor dialect in Van Hasselt (1915:20). In the Biak New Testament it occurs as *si-ya-user kuker wa-ya* 'they followed with the boat' (Yoh.21:8), while *si-yaw* by itself means 'they follow, chase', similar to Meyah *osku mem* 's/he trails a bird' and *osku joug mem* 's/he hunts a bird'.

All of these languages have something like 'sit + adjunct' for 'to protect, guard', with extended meaning 'comforting' the bereaved, as illustrated for Hatam (17) and Biak (18).

(17) *Yoni   i-gwam   ser   ni-ngon   ti*
     they   3PL-sit   'keep.out' 3SG-heart   NOM
     They are comforting him.

(18) *S-kain   us   ena   mar-mar*
     3PL-sit   'protect'   3PL   RED-die
     They sit down with the corpse.

The same adjunct with the verb 'to see' conveys some 'scrutiny', as Biak (19), Hatam (20) and Sougb (21) show.

(19) *Ya-mam   us   ro   nannane   resari*
     1SG-see   'protect'   REL   things   first
     I will study these things first.

(20) *Dani   di-ngat   ser   srad*
     I   1SG-see   'block.off'   letter
     I check the letter.

(21) *Dan   d-ed-eiya   dougwo   ind-an   srat*
     I   1SG-go-see   'block.off'   1SG-POS   letter
     I go check my letters

For Abun Berry and Berry (1999:26-28) described a very similar function for the grammaticalized variant of the benefactive marker *wa*. Compare (22) with the Hatam and Biak examples for the action of joining bereaved people in their sorrow, presumably by sitting with them in order to block off evil influences. Meyah lacks this possiblitiy for *joug* (Gravelle, p.c.)

(22) *Noru   ne   ye   ke-wa   Lamber   nombrok*
     night   DET   3INDEF   sit-TRS   Lamber   morning
     That night they guarded Lamber's (body until) the morning.

My preliminary conclusion is that Biak has adopted a basically eastern Bird's Head template for two adverbs which seem to have been grammaticalized to increase the valence and/or affect of a verb. In turn, the north-western Bird's Head language Abun may have calqued this construction from Biak visitors along the north coast.

7. Conclusion

A great number of sources give evidence that there have been extensive interlinguistic contacts in the area of Maluku and Papua for many centuries, at least since the arrival of the Europeans in the 16th century, but most likely these contacts (and migrations) had existed a long time before that date.

It seems likely that some of the speakers of (West) Papuan languages had moved from the Bird's Head westward, to Halmahera (Voorhoeve 1984; Wurm et al. 1975). Some 3500 years BP Austronesians arrived in the area, some of them directly to Maluku and dispersed there (the CMP languages), others to Halmahera and in and around the Cenderawasih Bay (SHWNG group), from which a further group split off to become the ancestors of the Oceanic subgroup of Austronesian languages (Ross 1995:85). It is not clear whether the AN speakers moved from Halmahera to the islands around the Bird's Head or vice versa.

Given the distribution of the AN traits in the West Papuan languages, one might entertain the hypothesis that these languages are relexified AN languages. This possibility is ruled out, I believe, because it cannot explain the clearly abundant AN vocabulary in all the AN languages of the area (pronoun sets, with reflexes of PAN Inclusive and Exclusive pronouns, number systems, basic vocabulary, reflexes of PAN derivational prefixes *pang- and *mang- for actives/causatives and intrasitives/processes) and its absence in the West Papuan languages.

In fact, the wildly divergent vocabularies of the West Papuan languages do not allow a fruitful investigation into their mutual genetic relationship, except for some local groups, like the Western Bird's Head languages Moi, Tehit, Moraid and Seget, and the two groups in the eastern Bird's Head: Mansim and Hatam are clear relatives and so are Meyah, Moskona and Sougb. But to what extent these groups are related to each other and to the 'isolates' Abun, Maybrat and Mpur remains dubious. Indeed, the pronoun sets of the West Papuan languages do suggest an ancient relation but one would like to have some further evidence. More than a few tentative cognates have not as yet been identified.

In the present paper I have tried to identify at least some features which may be related to one or the other group. The main difficulty in this discussion is that the term AN can be used to refer to a genetic group, whereas the term (West) Papuan for the moment lacks such denotation. The SVO order can be ascribed to AN influence on the West Papuan languages, whereas the word orders of the possessive constructions in the various languages point to a mutual influence.

The so-called 'reversed' Genitive-Noun, as present in AN Taba, Wandamen, and the local variants of Malay can be traced to Papuan languages, while the AN order N+G is present as an alternative in some of the NAN languages of the Bird's Head, presumably motivated by other AN languages such as Biak.

The I/E opposition has infiltrated all the West Papuan languages, with the exception of three (or four) languages located in the center of the Bird's Head, from west to east: Abun, Maybrat, Mpur, and (marginally) Hatam.

Quite a different fate befell the AN reduplication strategy of Ca(C)- deriving instrument-like nouns or indicating some durative aspect. It has not really been able to affect the West Papuan languages. Perhaps the very restricted spread of this AN trait (only Tidore, possibly Ternate?) as opposed to the wide-spread diffusion of the I/E opposition and the syntactic orders of SVO and N+G is due to (i) a sociological factor, such as degree and time of contact, and (ii) a psychological factor such as extent to which a certain trait is

part of the *Innere Form* of a language: the more deeply embedded morphological features are less easily borrowed.

The other two features discussed suggest that the AN languages have undergone Papuan influences. The final negative, most likely of Papuan origin, is attested throughout the area, while the typical function of two verbal adjuncts seems to be more local: originating in the eastern Bird's Head languages and spread to Biak (of course, the absence of evidence for this feature in other AN languages is not evidence of absence – it may well turn up in other AN languages as well; as it seems to have found its way into Abun and Maybrat, possibly via Biak).

The mixing of linguistic features can be ascribed to centuries-old intermingling of people. The longstanding supremacy of the Sultanates of Ternate and Tidore, consisting of West Papuan speakers, with their AN speaking vasals of the Raja Empat islands and Biak, was instrumental in the movements of people from around the Bird's Head to other areas. The intruders had all kinds of trading contacts along the coasts of the Bird's Head. Within the Bird's Head many people changed locations, either through intermarriage or because they were traded as slaves. These migrants brought along their own morphosyntactic configurations, which easily spread through the region. At the same time, each linguistic community held a strong sense of identity, expressed in a great diversity of vocabularies.

In this paper I have presented some global indications of some traits, meant as a start for further detailed comparison of many other features, such as the pronominal and spatial deictic systems, the expression of TAM categories, and other bound-like morphological material. Together with an inventory of the possible cognate sets, however small they may turn out for the West Papuan languages, such a comparison might lead us to answers to the remaining questions.

Whether the West Papuan languages indeed form another family of languages, apart from the proposed Trans New Guinea Family, see Campbell (1998:166) for the suggestion to avoid terms other than Family, remains a matter of further research. That is, there are two questions: To what extent form the West Papuan languages a coherent (genetic) group? And secondly, is such a group ultimately related to the TNG Family? And, notwithstanding my earlier dismissal of the hypothesis that (some) West Papuan could be relexified AN languages, it should not be completely ruled out.

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Nominalization in Rukai and Amis*
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1. Introduction

In this paper my primary purpose is to examine the nominalization process in two Formosan languages in Taiwan, Rukai (Budai)[1] and Amis (Changpin, Central Amis)[2]. I will argue that in both languages, special nominalizing elements, similar to –ing in English, are employed to make a verbal element into a nominal one. The nominalized phrase as a whole behaves externally as a noun phrase because it occupies the typical NP position and it can take a nominal case marker, but internally it behaves as a VP because the verb may take a direct object, assigning accusative case to it.

2. A Sketch of Rukai and Amis Grammar

Before discussing the nominalization process in details, I will consider some general properties of Rukai and Amis, with particular reference to those that are relevant to the discussion in this paper. Both Rukai and Amis are predicate-initial languages and the basic word order is VOS or VSO. This is illustrated in (1) and (2).

(1) Nouns as Predicates[3]
Rukai
a. [$_{NP}$ngoDaDekai] [$_{NP}$ka saLabo]
      Rukai   Nom   SaLabo
   "SaLabo is a Rukai."
Amis
b. [$_{NP}$u wawa nira] [$_{NP}$ kaku]
      Neu child his   I
   "I am his child."
(2) Verbs as Predicates (verb-initial)
Rukai
a. ma-dalame   ki   LaiLai   ka   saLabo,

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[1] Rukai, according to Li (1973), includes six major dialects, Tanan, Budai, Labuan, Maga, Tona, and Mantauran.
[2] Amis, according to Tsuchida (1982), includes five major dialects, Sakizaya, Northern Amis, Tavalong-Vataan, Central Amis and Southern Amis.
[3] In this paper I employ the following abbreviations in glosses:

AF	agent focus	Neg	negative marker	1	first person
PF	patient focus	Past	past tense	2	second person
LF	locative focus	Fut	future tense	3	third person
IF	instrument foucs	NonFut	nonfuture tense	Sg	singular
Nom	Nominative	Present	Present tense	Pl	plural
Acc	Accusative	Perf	Perfective	Stat	stative verb marker
Gen	Genitive	Rel	relative marker	Act	active marker
Obl	Oblique	Neu	neutral case marker	Pass	passive marker
Fin	finite marker	NonFin	nonfinite marker		

> Stat.Fin-like   Acc   LaiLai   Nom   SaLabo
> "SaLabo likes LaiLai."

Amis

b. ma-olah   ci   panay   ci   mayaw-an.
    AF-like   Nom   Panay   Acc   Mayaw
    "Panay likes Mayaw."

Sentences in (1) are the so-called equational sentences in *NP-(be)-NP* pattern and the copular verb, *be*, is not overtly lexicalized on the surface.   In Rukai and Amis, nominal case markers precede the case-marked noun phrase and in most cases they are obligatory. As Table 1 shows, in Rukai *ko* or *ka* can be used as nominative, accusative and even locative case markers.   While two arguments in a sentence are both marked by the same case markers, word order would be crucial in distinguishing objects from subjects. That is, the word order would be strictly VOS.

Table 1: Nominal Case System in Rukai

Nominative	Accusative	Locative	Genitive
ko (-visible, +distance ± human)	ko (-visible, +distance -human)	ko (generic)	
ka (+visible, -distance ± human)	ka (+visible, -distance + human)	ka (place name)	
	ki (+specific, +human)		ki (+specific, + human)

Table 2 lists Amis nominal case marking system.   Compared to Rukai, because of Amis' rich case markings, the word order is relatively free in Amis.

Table 2: Case Markers in Amis (Huang 1995:226)

nouns / numbers / cases	Neutral[4]	Nominative	Locative/ Accusative	Genitive
Common	u	ku	tu	nu
Proper Singular	ci	ci	ci..an	ni
Proper Plural	ca	ca	ca..an	na

Like most of the Formosan languages, pronouns in Rukai can be roughly divided into two sets, namely, bound pronouns and free pronouns, as shown in Table 3.   Bound

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[4] In some Formosan languages, the noun predicate in the pseudo-cleft construction need to be preceded with a "neutral case marker" in languages like Amis as argued by Huang (1994, 1995), or preceded with a "noun classifier" in languages like Paiwan and Kavalan as argued by Tang, Chang and Ho (1998) and Chang, Tang and Ho (1998).   Following the line of Chang et al.'s analysis, Liu (1999) re-examines the traditional case marking system in Amis and argues that the so-called "case markers" should be analyzed as morphological complexes, composed of a case marker and a noun classifier.

(i)   Paiwan (Tang, Chang and Ho, 1998: p. 337)
        *(ti) kai   a   aicu
        TI Kai Nom   this.
        "This is Kai."

(ii)   Amis (Huang 1994)
        ci   ufad kura   mi-namun-ay   a   tamdaw.
        Neu Ufad that-Nom AF-drink-water-AY Lin   man
        "That man that is drinking the water is Ufad."

pronouns are further divided into nominative and genitive forms. A bound pronoun, if represents the subject, has to be suffixed to the verb and form one unit, rather than remains sentence-finally.

Table 3: Pronominal System of Rukai (Budai) (adapted from Chen, 1999: p. 10)

Person	Plurality	Visible/Inclusive	Free	Bound	
			Accusative	Nominative	Genitive
1	Singular		nakoane	-(C)ako, -naw	-li
	Plural	+ Inclusive	mitaane	-ta	-(i)ta
		+ Exculsive	nayane	-nay	-nay
2	Singular		mosoane	-so	-so
	Plural		nomiane	-nomi	-nomi
3	Singular	+ Visible	iniane		-ini
		+ Invisible			
	Plural	+ Visible	liniane		-lini
		+ Invisible			

Table 4 summarizes Amis personal pronouns. There are four sets of personal pronouns, indicating nominative, accusative, genitive and possessive. All of them are free forms.

Table 4: Personal Pronouns in Amis (Liu, 1999: p.18)

	Nominative	Accusative/Locative	Genitive	Possessive
1S	kaku	takuwanan	aku	maku
2S	kisu	tisuwanan	isu	misu
3S	ciNra	ciNranan ciNraan	nira niNra	niNra nira
1PI	kita	kitanan titanan kitaanan titaanan	ita	mita
1PE	kami	Tamiyanan	niyam	niyam
2P	kamu	Tamuanan Tamuwanan	namu	namu
3P	caNra	CaNranan CaNraan	naNra	naNra

As was discussed by Li (1973), Kuo (1979), Zeitoun (1997a, b), Zeitoun et al. (1996, 1997) and Chen (1999), Rukai, unlike most Formosan languages which have focus marking system, exhibits an active/passive dichotomy, similar to English. This is illustrated in (3-4). In an active construction such as (3), an agent is marked as the subject, while in a passive construction such as (4), the patient or the theme is marked as the subject. The prefixes *w-* and *ki-* indicate active and passive voices respectively. As argued in Zeitoun et al. (1996, 1997), Rukai exhibits a bipartite tense system in which future is distinguished from nonfuture[5], rather than a tripartite one in which past contrasts with present and future as in English.

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[5] As pointed out by Zeitoun et al. (1996, 1997), the past and present interpretation in Rukai usually depends on the occurrence of aspectual affixes (-*nga*, verbal reduplication) or temporal adjuncts.

(3) Active Construction in Rukai
w-a-Lomai   ki LaiLai   ka/ko   saLabo.
Act-Fin-beat Acc   LaiLai   Nom   SaLabo
"SaLabo beat LaiLai."
(4) Passive Construction[6] in Rukai
ki-a-Lomai   ki saLabo ko LaiLai.
Pass-Fin-beat   Acc SaLabo   Nom LaiLai.
"LaiLai is beaten by SaLabo."

Amis, different from Rukai, employs so-called verbal "focus" markings to indicate the voice, as was discussed in Wu (1994, 1995), Huang (1994), Lin (1995) and Liu (1999) and many others.   The traditional term "focus" here refers to the semantic relationship (agreement) established between a verb (the focus affix) and the subject NP, which is termed as theta-agreement by Mei (1994) and Holmer (1996).   In other words, in Amis the verb has to agree with the theta role of the subject noun phrase, which could be an Agent, a Patient/Theme, a Location, a Beneficiary or an Instrument.   This is illustrated in (5-8):

(5) Agent Focus in Amis
mi-la'op   kura   wawa ci panay-an. (Liu 1999: p. 19)
AF-chase   that.Nom child Acc Panay
'The child is chasing Panay."
(6) Patient Focus in Amis
mi-futiq-**an**   nura   wawa kuni   kafutiqan (Liu 1999: p. 21)
PF-sleep-PF   that.Gen child   this. Nom   bed
"That child has slept on this bed."
(lit. "This bed has been slept by that child.")
(7) Locative Focus in Amis
pi- cirah-**an**   isu   tu   kuwa   ku kureN   (Liu 1999: p. 23)
PI-pickle-LF   2Sg.Gen Acc papaya   Nom   urn
"You pickled the papayas in the urn."
(lit. "The urn is the place where you picked the papayas.")
(8) Instrument Focus in Amis
sapi-tiwas   ni   arik   ku acam   tuya   qedo. (Liu 1999: p. 25)
IF-hook   Gen   Arik Nom bamboo that.Acc. mouse
"Arik hooked that mouse by a bamboo stick."
(lit. "The bamboo stick is the tool that Arik used to hook that mouse."

3. Nominalization
3.1 Rukai

I shall now turn to discuss the process of nominalization.   I will first examine Rukai.

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[6] Comparing the passive of Rukai (i) to that of English in (ii), the agent phrase in the passive is not "suppressed" as an adjunct as it is in English argued by Bresnan (1982), Shibatani (1988), Baker et al (1989) and many others.
   (i)   ki-a-Lomai   ki   saLabo   ko   LaiLai.
        Pass-Fin-beat   Acc SaLabo Nom LaiLai.
        "LaiLai is beaten by SaLabo."
   (ii) Mary was beaten by John.

3.1.1. Pseudo-cleft Construction
3.1.1.1. the nominalizer -ø

In Rukai, only some pseudo-clefts and complement clauses optionally undergo nominalization. Here I will first discuss the pseudo-clefts. The so-called pseudo-cleft sentences[7] as shown in (9) employ the equational construction discussed earlier.

(9) Pseudo Cleft Construction in Rukai
a. [$_{NP}$ moni] [$_{NP}$ ko   w-a-Lomai   ki   LaiLai]
   Moni   Nom   Act-Fin-beat Acc   LaiLai
   "The one who beat LaiLai is Moni."
b. [$_{NP}$ moni] [$_{NP}$ ko ki-a-Lomai   ki   LaiLai]
   Moni   Nom Pass-Fin-beat   Acc   LaiLai.
   "The one who is beaten by LaiLai is Moni."

In (9a), the focussed element *Moni* is a caseless noun predicate and the presupposed clause *w-a-Lomai ki LaiLai* is in subject position, preceded with a nominative case marker *ko*. Examining carefully, the presupposed clause in the pseudo-cleft construction is a complex NP that contains a null head. This is well-known as the headless relative clause. We indicate the head by the symbol *e* in the head position. The empty head and the gap in the relativized clause *t* are coindexed. Example (9a) can be partially represented as:

(10) [$_{NP}$ ko   [$_{CP}$ [$_{IP}$ [$_{INFL}$ wa-] [$_{VP}$ [$_{SpecVP}$ t_i] Lomai ki LaiLai]]] [$_{N'}$ [$_N$ e_i]]]

Consider another pseudo-cleft sentence (11), which is different from (9a).

(11)
a. [$_{NP}$ LaiLai] [$_{NP}$ ko   Lomai   ki/*ka/*ko saLabo]
   LaiLai   Nom   NonFin-beat   Gen/*Nom (Acc)/*Nom (Acc)
   'The one who SaLabo beat is LaiLai.'
b. [$_{NP}$ LaiLai] [$_{NP}$ ko   Lomai-ini/-li/*-ðako]
   LaiLai   Nom   NonFin-beat-3.Sg.Gen/-1.Sg.Gen/*-1.Sg.Nom
   'The one who he/I beat is LaiLai.'

The presupposed clause in the pseudo-cleft (11) contains a non-finite verb *Lomai*, followed either with a case-marked personal proper noun *ki saLabo* in (11a) or a genitive/possessive bound pronoun *–ini* in (11b). In (11a), *saLabo* cannot take *ka* or *ko* and it can only take *ki*. If the agent is represented by a genitive bound pronoun as in (11b), the genitive has a subject-like role, different from the modifier-like interpretation in (12). That is, (11b) indicates an expression that the event of beating has occurred.

(12) a. laimai ki saLabo
      'SaLabo' clothes'
    b. laimai-ini
      'his clothes'

As is well known from gerundive constructions in English and infinitival NPs in Italian, examples shown in (13) have been argued to be predicates of event-like entities. Both cases have been argued to undergo nominalization of verbs. Gerundives in English and infinitival NPs in Italian are analyzed as nominal IPs, head by *–ing* and infinitival morphemes *–ere/-are*, which take VP as its complement.

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[7] Ya-yin Chang (1998) is the first one who claims that the so-called cleft in Tsou is in fact a pseudo-cleft. And this perhaps is true for all Formosan languages. Also see Chung-lian Chang (1996) and Yung-li Chang (1997) for the discussion of cleft constructions in Seediq and Kavalan.

(13)
English
a. his sing**ing** the song
b. his sing**ing** of song
Italian
c. il suo scriv**ere** quella lettera improvvisamente (Zucchi (1993: p. 54))
   his write (inf) that letter suddenly
d. lo scrivere di Sibilla (Zucchi (1993: p. 152))
   the write (inf) of Sibilla
e. *lo scrivere della lettera (Zucchi (1993: p. 152))
   the write (inf) of the letter

There is, however, an important difference between Italian and English. While with English nouns in the of-phrase in (13b) may correspond to the object of the related verb, with Italian, nouns in the of-phrase in (13d-e) can never correspond to the object of the related verb, but only to the subject.

The structure of the examples of Rukai in (11) is pretty similar to that of infinitival NPs of Italian. The verb in (11) is non-finite and the noun in the presupposed clause can only correspond to the subject of the verb. Following this line, I propose that (11a) has the underlying structure (14), no matter whether one adopts the traditional NP hypothesis or Abney (1987) kind of DP hypothesis. Which of the NP hypothesis or DP hypothesis should be adopted is not my main purpose in this paper.

(11) (repeated)
a. [$_{NP}$ LaiLai]   [$_{NP}$ ko   Lomai   ki/*ka/*ko saLabo]
       LaiLai   Nom   NonFin-beat   Gen/*Nom (Acc)/*Nom (Acc)
    'The one who SaLabo beat is LaiLai.'

(14)
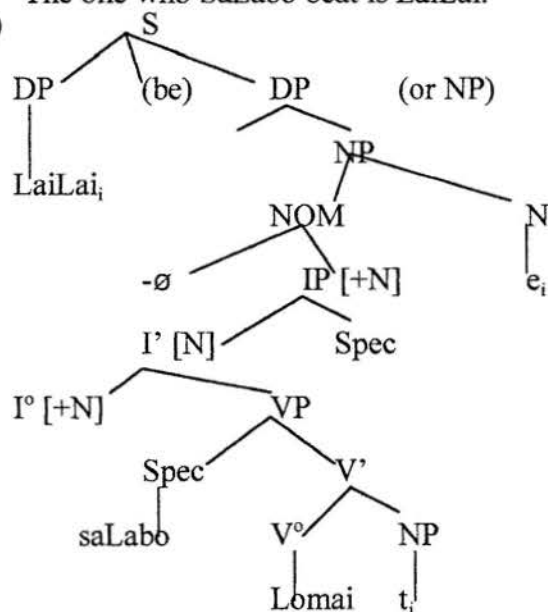
In (14), the IP is embedded under the scope of the nominalizer -ø. Given the nominal nature of IP$_{[+N]}$, the verbal complex head [I$_{[+N]}$ + V] after V° moving to INFL cannot assign nominative case to the Spec of IP, where the agent phrase *saLabo* was supposed to move to. Instead, genitive case marking applies, and we have the output (11a). Note that we have mentioned earlier the presupposed clause *ko Lomai ki saLabo* is in fact a headless relative clause, in which the original object *t$_i$* is relativized. The infinitival phrase *Lomai ki*

saLabo as a whole behaves externally as a noun phrase taking a case-marker *ko* because it occupies the typical NP position, but internally it behaves as a VP because the verb may take a direct object, assigning accusative case to it.

A similar process of nominalization occurs optionally in the existential construction with the verb *kaDua* 'does not exist' in (15).

(15) Existential Construction in Rukai
kaDua   ko ka-dalame-li   kai   ki   lamaliali
don't exist   Nom NonFin-like-my   these   Acc women
'That I like these women does not exist.' (Lit: I don't like these women.)

Following the DP analysis of Abney (1987), Szabolcsi (1987, 1989), Stowell (1989, 1991) and Longobardi (1994), Siloni (1997) argues that DP is important not only as a functional projection of nominal expressions, but also its unique selection of non-tensed nominal complements, making D as the equivalent of C which must be associated with a tense operator.   All the cases of English gerundives, Italian nominalized infinitives, French reduced relatives and Hebrew semi-relatives are all treated similarly in Siloni (1997), by assuming that these relevant verbal forms do not bear tense features.   This line of analysis seems to account for the nominalized infinitives in Rukai.   I will show, however, in the following section, that Siloni's proposal is arguably too strong for the nominalization involving the other nominalizing morpheme *-ane* in Rukai.

3.1.1.2. the nominalizer *-ane*

In addition to the nominalizer *-ø*, Rukai has another nominalized pseudo-cleft employing the nominalizer *-ane*, as examplified in (16).   While *-ane* is used, in most cases, it is used for the theme or the location, but not the agent.

(16) bava ka   ta-ongolo-**ane**-li
     wineNom   NonFut-drink-**ane**-1.Sg.Gen
     'The one that I drank is the wine.'

In addition to the prefix *ta-* in (16) there are other prefixes *a-*, *Li-* as shown in (17-18), which are used together with the nominalier *-ane*.   All these prefixes, as discussed by Kuo (1979) and Chen (1999), indicate an event which happens at any time other than the future, or in the immediate future or in the distant future.   Then Siloni's claim of DP's selection of non-tensed operator is too strong for the case of the nominalizer *-ane*.   A similar case is also found in Amis.   This will be discussed when we proceed to the Amis data in section 3.2.

(17) bava ka   a-ongolo-**ane**-li
     wineNom   Fut-drink-**ane**-1.Sg.Gen
     'The one that I will drink is the wine.'
(18) bava ka   Li-ongolo-**ane**-li
     wineNom   Fut-drink-**ane**-1.Sg.Gen
     'The one that I will drink is the wine.'

In a serial verb construction as shown in (19), the matrix verb (not the embedded verb), placed immediately under the scope of the NOM, moves up to nominal IP to take up the nominalizer *-ane*.

(19) ngoDaDeaDeka-ane ko a-paθagil-ane   kiθiaθingale ki vavalake.
     Rukai   Nom Fut-begin   learn   Gen child
     "The language that the child will begin to learn is Rukai."

3.1.2. Complement Clauses
3.1.2.1 the nominalizers -ø and -ane

In addition to the nominalized pseudo-cleft, some of the clausal complments in Rukai undergo the nominalization optionally.   This is illustrated in (20).   Verbs like *waDeDeDele* 'watch' in (20a) take a nominalized infinitive head by the nominalier -ø morpheme.   Other verbs like *kyasease* 'grateful', *masamali* 'surprised' can either take a finite clausal complement lead by a complementizer *alaka* 'that' as in (20b), or take a nominalized IP head by *–ane* as in (20c-d).   Example (20a) has the underlying structure (21a) and example (20d) has (21a):

(20)
a. w-a-DeDeDele   ka saLabo ko sina-sinaw-li   ko   laimai
    Act-Fin-watch   SaLabo Acc Act-Fin-Red.wash   Acc clothes
    "SaLabo is watching me washing the clothes."
b. kyasease-nako alaka paralobo-so nakwan. (Kuo 1979: p. 56,)
    grateful-I   helped-your   me
    "I am grateful that you helped me."
c. kyasease-nako ko ta-paralob-**ane**-so nakwan. (Kuo 1979: p. 56,)
                    Helping-your
    "I am grateful for your helping me."
d. masamali-ako   ko/ka ta-Lomað-**ane**-(ini)   ki   saLabo ki LaiLai
    surprise-1.Sg.Nom Acc   NonFut-beat-ane-3.Sg.Gen Gen SaLabo Acc LaiLai
    " I am surprised by SaLabo's beating LaiLai."

(21)
a.

b.

```
                              V'
        V                           DP  (or NP)
                                    NOM
     masamali-ako            -ane         IP [+N]
                                      I'         Spec
                                I° [+N]   VP
                                     Spec        V
                                  ki saLabo   V      NP
                                             Lomai   ki LaiLai
```
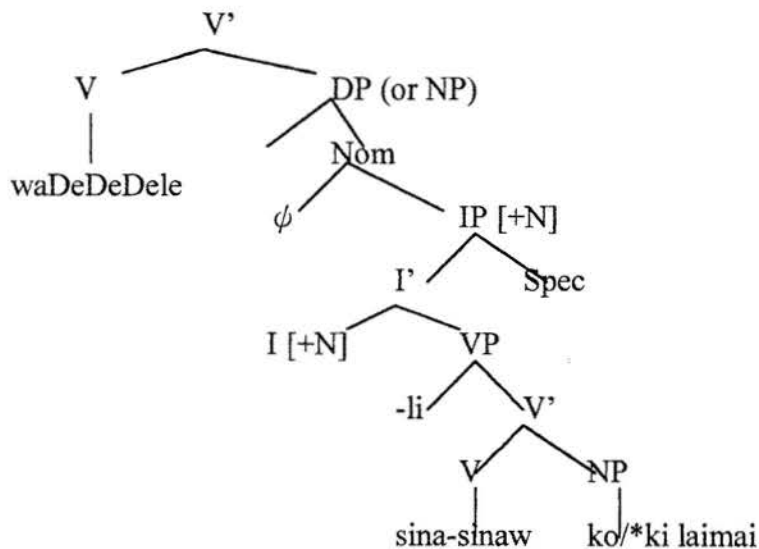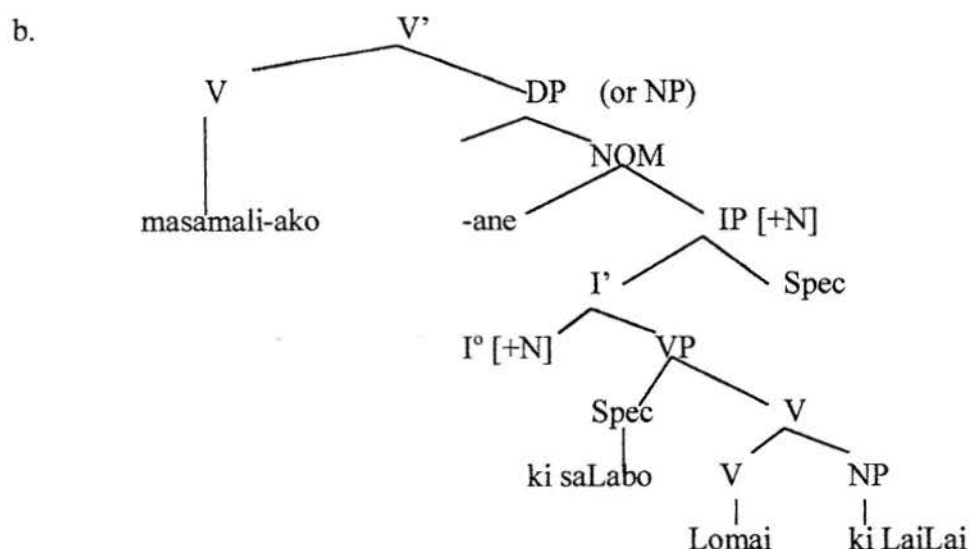
Let's examine the structure (21b). The whole complement clause *ta-Lomað-ane-(ini) ki saLabo ki LaiLai* is nominalized and is case-marked by *ko/ka*. Similar to the case in (14), the agent subject, *saLabo*, due to the nominal nature of IP, takes a genitive case marker *ki*, rather than a nominative case marker *ka* or *ko*. The verb, *Lomai*, assigns an accusative case to the direct object *LaiLai*. The agent subject, *saLabo*, has to precede the object, *LaiLai*, which is strictly VSO order.

3.1.3. Lexical Nominalization

In Rukai, a large of number of verbs, involving the syntactic nominalization of the morpheme *–ane*, has been so widely used that they are lexicalized and become nouns. Some are listed in (22). They no longer show any verbal properties. They are referential and can therefore appear in argument positions. They can also be modified by relative clauses. Thus they should be analyzed lexically as nouns and they do not involve a syntactically verbal projection.

(22)
a. bengeLai "flower"   babengeLað-**ane**   "garden"
b. ngoDaDekai "Rukai people" ngoDaDekað-**ane**   "Rukai language"
c. boLo "teach"   ta-kiboLoboLo-**ane** "school"
d. sinaw "wash"   ta-sina-sinav-**ane** (Chen 1999: p. 16)
                               "a place where people wash clothes"
e. mubanava "bathe"   ta-mubana-banav-**ane** (Chen 1999: p. 16)
                               "a place where people take a bath"
f   Dipon "Janpanese people"   DiDipong-**ane** "Japanese language"

3.2. Amis
3.2.1. Relative Clauses and Pseudo-cleft Constructions
3.2.1.1. the nominalizers *–ay* and *–an (-ø)*

I shall now turn to Amis. As I have mentioned earlier, Amis is different from Rukai in that Amis employs verbal focus markings to indicate the voice. It is a four-way focus marking system in Amis, compared to the active/passive dichotomy in Rukai. With respect to the nominalization in Amis, as was discussed in Liu (1999), only relative clauses (including headless relative clauses) and pseudo-clefts undergo nominalization and it is obligatory. In addition, the relative clauses in Amis (and in most Formosan languages)

are strictly subject to the so-called subject-sensitivity, which is firstly claimed by Keenan (1976). That is, only the grammatical subjects of relative clauses can be relativized. For example, it is possible to relativize the subject *wawa* 'child' (the agent), but not the object *panay* (the patient) in the Agent Focus Construction (5). On the other hand, in the Patient Focus construction (6), it is possible to relativize the subject *kafutiqan* 'bed' (the theme), but not the object *wawa* 'child' (the agent).

(5) Agent Focus in Amis (repeated)
  mi-la'op   kura   wawa ci panay-an. (Liu 1999: p. 19)
  AF-chase   that.Nom child Acc Panay
  'The child is chasing Panay."

(6) Patient Focus in Amis (repeated)
  mi-futiq-**an**   nura   wawa kuni   kafutiqan (Liu 1999: p. 21)
  PF-sleep-PF   that.Gen child   this. Nom   bed
  "That child has slept on this bed."
  (lit. "This bed has been slept by that child.")

In Amis, any relativized construction obligatorily undergoes a process of nominalization, as argued by Lin (1995) and Liu (1999). This is exemplified in (23-25). Similar to the case in Rukai, internally the verbal clause still keeps the verbal property of assigning accusative case to the direct object, but after V° moving to INFL, and then to the nominalization projection of *–ay* and *-ø/-an*, the whole IP phrase behaves externally as a noun phrase. The underlying structure of example (25b) can be roughly represented as (26). The verbal focus markings would be decisive in which of the nominalizers the verb should take. The verb in the agent focus construction has to take the morpheme *–ay*, while the verb in the patient focus, locative focus and instrument focus constructions will take the morpheme *-ø/-an*.

(23) Relative Clause in Amis
  a. ma-'osi   ku   Nohah   aku   tura   [[[ma-tawa'-**ay**
   [AF-hate   Nom   boy:friend   1S.Gen. that-Acc   AF-laugh-AY
   takuwanan $_{IP}$] (a) $_{CP}$]   migutiNay $_{NP}$] (Liu 1999: p. 71)
   1Sg.Acc   Link   fisherman]
   'My boy friend hates the fisherman who is laughing at me.'
  b.   ma-olah   kura   fa'inayan tuya   [[[pi-kalaN-**an**
   AF-ask Nom-that   girl   Acc-that   LF$_1$-fetch:crabs-LF$_2$
   aku____$_{i IP}$] (a) $_{CP}$]   riyar $_{i NP}$]   (Liu 1999: p. 70)
   1Sg.   Link   seashore
   "The girl likes the seashore where I fetched crabs."

(24) Headless Relative Clause in Amis
  a. ma-'osi   ku   Nohah   aku   tura   [[[ma-tawa'-**ay**
   [AF-hate   Nom   boy:friend   1S.Gen. that-Acc   AF-laugh-AY
   takuwanan $_{IP}$] $_{CP}$] ϕ $_{NP}$]   (Liu 1999: p. 71)
   1Sg.Acc   ]
   'My boy friend hates the one who is laughing at me.'
  b. ma-kalat   nu [$_{NP}$[[mi-kilim-**an**   isu $_{IP}$]$_{CP}$] ϕ $_{NP}$] kuni   fafuy.
   PF-bite   Gen   PF$_1$-seek-PF$_2$ 2Sg.   Nom-this pig
   "The thing which was looked for by you bit this pig." (Liu 1999: p. 71)

(25) Pseudo-cleft Construction in Amis
  a. [$_{Cleft-NP}$ uni   wawa]$_i$ [$_{NP}$ ku   mi-lamlam-**ay**   tu   matu'away____$_i$]
   Neu-this   child   Nom AF-mingle-AY   Acc   old:man
   "It is this child that is mingling with the old men." (Liu 1999: p. 99)
  b. [$_{Cleft-NP}$ ura   lutuk][$_{NP}$ ku   pi-'eli-**an**   ni rekar ___$_i$]
   Nom-that mountain Nom   LF-weed-LF Gen Rekar
   "The place where Rekar weeded is that mountain." (Liu 1999: p. 104)

(26)

[_NP (or DP) uni wawa] [_NP (or DP) [_NOM –**ay** (-ø/-**an**) [_IP [+N][_VP[_V mi-lamlam][_NP tu matu'away]]]] ø_(N head)]

Remember that I have argued earlier that the claim of DP's selection of nontensed complement proposed by Siloni (1997) is too strong for the case of nominalization of –*ane* in Rukai. Here the Amis data provide another piece of argument against Siloni's proposal. As is widely discussed in the literature of Formosan languages, the verbal focus (voice) morphology also bears overtones of tense. Agent Focus in general suggests nonpast tense and Patient, Locative, or Instrument Focus suggests past tense. In the case of nominalization in Amis, the co-occurrence of verbal focus markings with –*ay* and -ø/-*an* suggests once again Siloni's claim is too strong.

With respect to the nominalizing morpheme -ø, one may suggest that it is –*an* morpheme and since the –*an* morpheme is the same as the patient or locative focus affixes –*an*, two –*ans* merge morphologically as one. Here I am not in a position arguing in flavor of either anlaysis.

In Amis serial verb construction as in (27), only the matrix verb takes the nominalizing element. This is similar to the case in Rukai.

(27) serial verb construction in Amis
  ci   mayaw ku   ma-talaw-ay (a) mi-pacuk tu   fafuy.
  Nom Mayaw Nom AF-afraid-AY   kill Acc   pig
  "The one who is afraid of killing pig is Mayaw."

Look at the Amis verbal negator *ca'ay* in (28). *ca'ay* can be optionally pronounced as *cai* in any declarative construction. But in the pseudo-cleft such as (28), *ca'ay* but not *cai* can be used. Obviously, *ca'ay*, as a verbal negator, has taken the nominalizing element –*ay*.

(28) ca'ay vs. cai
a. ci   panay anuca ci   mayaw ku   mi-fanaw-ay tu   kaisin.
  Nom Panay or   Nom Mayaw Nom AF-wash   Acc dishes
  "Is the one who washed the dishes Panay or Mayaw?"
b. ci   panay anuca ci   mayaw ku   ca'ay/*ca' pi-fanaw   tu kaisin.
  Nom Panay or Nom Mayaw Nom Neg   PF-wash   Acc dishes
  "Is the one who doesn't wash the dishes Panay or Mayaw?"

3.2.1.2. Lexical Nominalization

Similar to the case in Rukai, a group of fixed elements in Amis, derived from certain verbs, constitutes an instance of lexical nominalization. These are lexically analyzed as nouns.

(29)   Amis (Liu 1999, p. 51)
  a. mi-futiN 'to fish';   mifutiNay 'fisherman'
  b. mi-tilid 'to study';   mitiliday 'student'
  c. ma-sakero' 'to dance';   masakero'ay 'dancer'
  d. ma-tayar 'to work';   matayaray 'worker'
  e. ma-liNad 'to till';   maliNaday 'farmer'
  f. r-um-adiw 'to sing';   maradiway 'singer'
(30) Amis
  a. mi-cudad 'study'   pi-cudad-**an**   'school'
  b. mi-holol 'chat'   pi-holol-**an**   'place where people get together';

		(ta-holol-**an**)	'person who we chat with'
c. mi-ngingoy	'bathe'	pi-nginguy-**an**	'bathroom'
d. mi-tangtang	'cook'	pi-tangtang-**an**	'kitchen'
e. ma-futiq	'sleep'	ka-futiq-**an**	'bed'

4. Conclusion

To summarize, in Table 5, I provide a brief summary comparing the nominalization process in Rukai and Amis.   First, since Li (1973), Rukai has been argued to differ drastically from Amis and other Formosan languages in that Rukai does not display a four-way focus system.   Instead, its voice system is based on an active/passive dichotomy. Second, nominalization is very productive in Rukai and it takes place optionally in syntactic constructions such as pseudo-clefts and clausal complements.   Compared to Rukai, the nominlization in Amis is strictly limited to the relativized constructions.   And it is obligatory.   Third, Rukai is not that different from Amis with respect to the nominalization process.   The nominalizer, -ø, of Rukai, is used in the case that the noun inside the nominalized phrase corresponds to the agent subject of the verb, parallel to the nominalizer –*ay* in Amis.   The nominalizer –*ane* of Rukai is used in the case that the noun inside the nominalized phrase corresponds to the location or the theme of the verb, parallel to the nominalizer –*an* in Amis.   The claim here further supports the conclusion argued by Zeitoun (1999) that Rukai shares a number of identical morphosyntactic processes with the other Formosan languages.

Table5: Characteristics of Nominalization

Rukai	Amis

Voice system
  Passive/active dichotomy
	Focus sytem
	  a four-way focus system

Optional nominalization in pseudo-clefts	Obligatory nominalization in relative clauses and pseudo-clefts
Optional nominalization in complement clauses	--

Two nominalizers
  -ø agent subject
  -ane location;
      theme;
      patient (very limited)
	two nominalizers
	  -ay agent focus
	  -an (-ø) locative focus;
	      patient focus;
	      instrument focus

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1.   Introduction

Templatic effects are widely observed in many languages of the world. Such effects are usually attributed to various domains of morphology; in particular, such effects are strongly associated with reduplicative morphology. Templatic effects may also be a more general property of a language, in which case the language as a whole may be characterized as templatic. It is such cases that I wish to draw attention to in this paper, where I examine a particular type of templatic effect in the Austronesian language Mukah Melanau.

Mukah Melanau is a member of the Northwest Borneo group of Austronesian languages, and is spoken on the northern central coast of Sarawak. This language has been described in the most depth in work of Blust, who performed fieldwork several times on Mukah Melanau and whose descriptions and (historical) analyses appear in Blust (1988, 1997). The data I will consider here are taken from these works.

The data I focus on involve allomorphic alternations in the realization of the active and passive voice markers in Mukah. To briefly lay out the direction of the paper, in section 2 I provide the data, showing that the active and passive markers in the languages have drastically different allomorphy which can be quite easily described. This explanation is given in section 3, where I argue that the allomorphy is predictable based on relatively simple assumptions about featural specification. This move not only allows for a satisfying account of the allomorphy but also relates to the representation of the underlying forms of the morphemes in question. Section 4 provides the bulk of the analysis. I first analyze cases of prefixing allomorphy, after which I turn to cases involving simple ablauting allomorphy. Here I show that the ablauting allomorphy is an effect of fixed prosody, arising in cases where featural preservation is not at stake. In section 5, I turn to the cases Blust refers to as "compound ablaut", which show an unexpected behavior with respect to a subclass of forms. These data, I argue, are evidence for a particular markedness constraint that forces two segments that share place to coalesce into a single segment. Finally, section 6 offers a conclusion.

2.   The Phenomenon

The data I focus on concern three forms of verbs in Mukah. The basic form is an unaffixed stem, which may be either a verb or a noun. As a verb, it is usually interpreted as imperative (Blust 1997). There are two morphologically complex forms that are considered here as well: the active and passive forms. These forms present an intriguing allomorphy, which is conditioned by the phonological shape of the base of affixation, and can be divided into two principal surface patterns. The first of these patterns is a prefixational allomorphy: when the first vowel of the stem is any vowel other than schwa ([ə]), we find the prefixed allomorph (*mə-* or *nə-* if the stem is consonant-initial; *m-* or *n-* if the stem is vowel-initial):

(1)   Affixation to consonant-initial verbal bases with full vowel

	Unaffixed	Active	Passive	Gloss
a.	biləm	məbiləm	nəbiləm	'blacken'
b.	gutiŋ	məgutiŋ	nəgutiŋ	'cut with scissors'

Adam Ussishkin

(2)   Affixation to vowel-initial bases with full vowel

	Unaffixed	Active	Passive	Gloss
a.	aŋit	maŋit	naŋit	'anger'
b.	ituŋ	mituŋ	nituŋ	'count'
c.	ulin	mulin	nulin	'rudder'

The second allomorph occurs when the first vowel of the stem is schwa [ə]. In these cases, we find ablaut: the passive is signaled by *i*, and the active by *u*, in the first syllable:

(3)   Affixation to verbal bases with schwa: u-ablaut (active) vs. i-ablaut (passive):

	Unaffixed	Active	Passive	Gloss
a.	gəga	guga	giga	'chase away'
b.	gəgət	gugət	gigət	'gnaw, moth'
c.	kəkay	kukay	kikay	'rake'
d.	kəkut	kukut	kikut	'excavate'
e.	ləpək	lupək	lipək	'fold'
f.	ləpəw	lupəw	lipəw	'pick'
g.	njənjaʔ	njunjaʔ	njinjaʔ	'chew'
h.	ŋəŋət	ŋuŋət	ŋiŋət	'gnaw'
i.	səbət	subət	sibət	'make'
j.	səkəl	sukəl	sikəl	'strangle'
k.	sələg	suləg	siləg	'burn'
l.	səpəd	supəd	sipəd	'hack, chop'
m.	səput	suput	siput	'blowpipe'
	Unaffixed	Active	Passive	Gloss
n.	səsaŋ	susaŋ	sisaŋ	'pay'
o.	səsəp	susəp	sisəp	'sip, suck'
p.	təbək	tubək	tibək	'stab'
q.	təbəŋ	tubəŋ	tibəŋ	'to fell (a tree)'
r.	tətək	tutək	titək	'cut'
s.	tətəŋ	tutəŋ	titəŋ	'drink'

The remaining data of interest illustrate what Blust (1997) refers to as compound ablaut: in these cases the active voice not only has the *u* associated with normal ablaut, but in addition the resulting verb form begins with *m-*. Notice that all the stems to which compound ablaut applies begin with a voiced or voiceless labial plosive.

260

(4)   Affixation to labial-initial verbal bases with schwa: *m-* plus u-ablaut (active) vs. i-ablaut (passive)

	Unaffixed	*Active*	*Passive*	*Gloss*
a.	bəbah	mubah	bibah	'split (stative)'
b.	bəbəd	mubəd	bibəd	'tie'
c.	bənuʔ	munuʔ	binuʔ	'kill'
d.	pəpah	mupah	pipah	'hit, whip'
e.	pəpək	mupək	pipək	'a whip'

3.   Full vs. featureless vowels

A crucial step toward understanding the alternation between forms that exhibit prefixation of the active or passive morpheme, as opposed to those which exhibit ablaut, is to recognize that the forms undergoing ablaut all contain a schwa in their initial syllable. In any form that contains any other vowel in the initial syllable we find a prefixed allomorph. This correlation, I believe, provides strong support for several constraints that are operative in an optimality-theoretic account of these facts.

Another crucial point is the input to these processes. As far as the verbal stems are concerned, I assume that their input is identical to their unaffixed surface form. The issue of input for the prefixes, however, is complicated by the attested allomorphy. I posit an abstract underlying form for each prefix as follows:

(5)   Active and Passive morphemes

Active	*Passive*
/mu-/	/ni-/

These morphemes are underlyingly more abstract in order to explain their attested surface forms. Consider first the forms where the active or passive morpheme is prefixed; that is, in cases where the stem contains a full vowel in the first syllable. In these cases, the vowel of the prefix always surfaces as schwa. Assuming that Mukah words have a trochaic foot aligned at the right edge of the word, and following Blust (1997), this is due to a constraint called Prepenultimate Neutralization, which reduces any unfooted vowel to schwa. Naturally, this constraint requires further phonetic motivation, but its effects are visible throughout the language: in the data at hand, no exceptions to this constraint exist.[1] As such, it is considered here as an undominated constraint:

(6)   PREPENULTIMATE NEUTRALIZATION (PPN)

        Unfooted syllables do not license vowel place features.

Thus, when the prefix *mu-* is attached to a two-syllable stem, the vowel of the prefix is reduced to schwa. This results in a violation of a correspondence-theoretic constraint on featural identity (McCarthy & Prince 1995):

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[1] Although I do not deal with this issue here, this neutralization can be related to observations concerning prosodic prominence: stress in Mukah falls on the penultimate syllable, unless that syllable contains schwa, in which case stress is final (Blust 1988). Prepenultimate position is never prosodically prominent, so contrast in vowel quality is not maintained here.

(7) IDENT

Correspondent segments have identical featural specifications.

The two constraints interact in such a manner that PPN must outrank IDENT, as illustrated in the following tableau:

(8)   *məgutiŋ* 'to cut with scissors, active'

/mu-gutiŋ/	PPN	IDENT
a. mugutiŋ	*!	
☞ b. məgutiŋ		*

This basic constraint interaction explains the cases of prefixational allomorphy in the Mukah active and passive verbal paradigms. From here, we now move on to the more complicated instances of ablaut, where I argue that such cases involve the effects of requirements on prosodic alignment resulting in fixed prosody.

4.   Fixed prosody and its interaction with faithfulness

Let's now consider vowel-initial stems, whose affixed forms involved deletion of an affixal vowel. An example is the form *ituŋ*, whose passive form is *nituŋ*. Note that such a case results in a bisyllabic output. This illustrates our first case of *fixed prosody*, whereby a derived form must conform to a certain output shape. In this case, the fixed output shape is two syllables, and is enforced through a constraint on maximal word size. This constraint is called SYLLABLEALIGNMENT:

(9)   SYLLABLEALIGNMENT (σ-ALIGN)

Every syllable must be aligned to some edge of the prosodic word.

σ-ALIGN may be considered an extension of the notion Hierarchical Alignment, as formalized in earlier work by Ito, Kitagawa, & Mester (1996:242). Hierarchical Alignment is defined as follows:

(10)   Hierarchical Alignment (Ito, Kitagawa, & Mester 1996:242)

Every prosodic constituent is aligned with some prosodic constituent, containing it.

∀Pcat1 ∃Pcat2 [Pcat2 ⊃ Pcat1 & Align (Pcat1, Pcat2)]

where Pcat stands for a prosodic category.

The essential insight of Hierarchical Alignment is to disallow any structure that involves more than two instances of a prosodic category x contained within a prosodic category y. In their analysis of Japanese *zuuja-go*, Ito, Kitagawa, & Mester assume that this constrain applies at the foot level, such that every foot must be aligned to some edge of a prosodic word. In this analysis of Mukah fixed prosody, I propose to extend this constraint such that it may apply between non-adjacent levels of prosodic structure. Thus, rather than aligning foot edges to word edges, σ-ALIGN demands that syllable edges be aligned to word

edges. This approach is also taken in Ussishkin (in preparation) to account for similar fixed prosodic effects in Semitic verbal morphology.

σ-ALIGN assesses a violation for every candidate containing more than two syllables, since any syllable not at the edge of the word will not be aligned to a word edge. Crucially, examples of verb stems beginning with a vowel show that the constraint MAX must be dominated. This constraint, familiar from correspondence theory (McCarthy & Prince 1995), appears below.

(11)   MAX

Every segment in the input has a correspondent in the output.

The interaction between the two relevant constraints is illustrated here for the derivation of the passive form *nulin* 'rudder'.

(12)   *nulin* 'rudder, passive'

/ni-ulin/	σ-ALIGN	MAX
a. nəulin	*!	
☞ b. nulin		*

Candidate (a), which satisfies PPN (at the cost of violating IDENT), crucially violates the constraint σ-ALIGN. Candidate (b) satisfies σ-ALIGN, at the cost of violating lower-ranking MAX. One potential argument against this ranking logic could be formulated as follows: since candidate (a) violates IDENT, it could be claimed that this form shows only that IDENT outranks MAX, and that there is no evidence for the constraint σ-ALIGN. However, clearer evidence for this constraint and its ranking with respect to MAX is available by looking at forms that exhibit ablaut. For instance, consider the passive form *kikut*. The input to this surface form is *ni-kəkut*. The following tableau again illustrates the interaction between σ-ALIGN and MAX.[2]

(13)   *kikut* 'to be excavated'

/n$_1$i$_2$-kə$_3$kut/	σ-ALIGN	MAX
a. n$_1$ə$_2$kə$_3$kut	*!	
☞ b. ki$_2$kut		**

I return to such forms shortly; for now, it suffices to state that they clearly show that the constraint on fixed prosody outranks the faithfulness constraint MAX.

At this point, some further elaboration on the faithfulness constraints involved in prefixing allomorphy is required. Let us look more closely at the example *nəgutiŋ*. We have already seen how the optimal form is chosen when the two relevant constraints are PPN and IDENT. The following tableau recapitulates this, and also shows how the candidates fare with respect to σ-ALIGN and MAX:

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[2] Crucial correspondence relations in the input and output representations appearing in the following tableaux are indicated with subscripted numerals.

(14) *məgutiŋ* 'to cut with scissors, active'

/ni₁-gu₂tiŋ/	PPN	IDENT		σ-ALIGN	MAX
a. ni₁gu₂tiŋ	*!			*	
b. gi₁tiŋ					*
☞ c. nə₁gu₂tiŋ		*		*	

Given this tableau, we may now attempt to establish further rankings among the four constraints seen so far. Given that candidate (c) is chosen over candidate (b), the constraint MAX must dominate the constraint IDENT, since the optimal output violates IDENT, but not MAX. Candidate (b), on the other hand, violates MAX, and satisfies IDENT. Since, as shown above, σ-ALIGN must dominate MAX, by transitivity it must move higher in the ranking as well. Therefore, we rerank these constraints to give the following ranking:

(15) *Ranking among constraints*

> PPN
> |
> σ-ALIGN
> |
> MAX
> |
> IDENT

This result is troublesome, however, because it fails to account for a crucial fact: with the constraint σ-ALIGN now higher-ranking than IDENT, we incorrectly choose the ablauting candidate as optimal in all cases, even though that should result in prefixation:

(16) *məgutiŋ* 'to cut with scissors, active'

/ni₁-gu₂tiŋ/	PPN	σ-ALIGN	MAX	IDENT
a. ni₁gu₂tiŋ	*!	*		
☜ b. gi₁tiŋ			*	
☞ c. nə₁gu₂tiŋ		*!		*

Candidate (a) can be ruled out immediately because of its fatal violation of PPN, a constraint which is never violated on the surface in this language. However, candidate (b), which we need to rule out, is incorrectly predicted by the ranking in this tableau, as indicated by the backward-pointing hand. What this shows is that some constraint must dominate σ-ALIGN in order to rule out candidate (b) as the optimal form in favor of the actual output, candidate (c). Determining the nature of this constraint is the next issue. I claim that the choice of constraint should reflect what we observe empirically: that in the case of a verbal stem with a full vowel in the initial syllable, we always find prefixing allomorphy. This is in contrast with ablauting allomorphy, which occurs in every verbal stem whose initial vowel is schwa. These observations point to an important insight: that the featural (specifically, the place-featural) specifications of stem vowels require high-ranking faithfulness. In particular, my proposal is that such data provide evidence for an output-output constraint that demands that every place feature in a verbal stem be preserved in a related form:

(17)   OO-MAX-PL(ACE)

A place feature in a verbal stem has a correspondent in a related form.

The force of this constraint is to crucially preserve a stem vowel if that vowel is a full vowel; the analysis rests on the critical assumption that the vowel schwa is unspecified for place features. This is why abault is found only in cases where a verbal stem has schwa in the initial syllable: deleting the schwa does not violate the constraint OO-MAX-PL. However, when the stem-initial vowel is a full vowel, replacing it, in effect, with the vowel of the prefix does violate this constraint. Note that this constraint is crucially of the output-output variety, following work of Benua (1995, 1997): featural specifications of vowels in related *output* forms is at issue. Thus we do not always find the prefixal vowel surfacing faithfully; as observed above, in prefixing allomorphy this vowel is always neutralized, and only shows up in cases of ablaut. This type of "MAX-F(EATURE)" constraint has precedence in earlier work, e.g., Lombardi 1995, 1998, Causely 1996, Walker 1997; cf. Lamontagne & Rice 1995 on coalescence and feature parsing.

Recall that the motivation behind ablaut is to conform to the fixed prosodic constraint σ-ALIGN. It must be the case, as discussed above, that some constraint dominate σ-ALIGN in order to prevent ablaut from occurring when the stem-initial vowel is not schwa. OO-MAX-PL serves this function, as the following tableau illustrates:

(18)   *məgutiŋ* 'to cut with scissors, active'

/ni₁-gu₂tiŋ/	PPN	OO-MAX-PL	σ-ALIGN	IDENT
a. ni₁gu₂tiŋ	*!		*	
b. gi₁tiŋ		*!		
☞ c. nə₁gu₂tiŋ			*	*

Because the ablaut candidate (b) violates OO-MAX-PL, it may not surface. However, consider the case of a stem whose initial vowel is schwa:

(19)   *kikut* 'to be excavated, passive'

/n₁i₂-kə₃kut/	OO-MAX-PL	σ-ALIGN	MAX
a. n₁ə₂kə₃kut		*!	
☞ b. ki₂kut			**

The winning candidate here has no violations of OO-MAX-PL: this is because although the first vowel of the stem has no correspondent in the optimal output, the unparsed vowel is schwa, which lacks place features (Jakobson 1938, Anderson 1982, Browman & Goldstein 1992). Therefore OO-MAX-PL is vacuously satisfied by such a candidate. OO-MAX-PL plays no role in determining the outcome in such a case; as the tableau shows, the competition is therefore passed down to the constraint σ-ALIGN, which favors the bisyllabic output.

We have so far successfully accounted for the main split in the allomorphy exhibited in the active and passive verbal paradigms of Mukah. As we have seen, fixed prosody is emergent; that is, it occurs only in case it does not violate higher-ranking faithfulness constraints. Although the language has a strong desire for words to conform to a maximally bisyllabic size, this is only possible if such a prosodic shape does not involve the deletion of vowel-place features from the verbal stem. In the case where the relevant stem vowel is schwa, there are no vowel-place features to preserve, in which case fixed prosody dictates that a bisyllabic output form is optimal.

Adam Ussishkin

5. Compound ablaut as coalescence

An interesting portion of the data remain to be captured under this analysis, however. This portion involves what is termed by Blust (1997) *compound ablaut*, which involves a further alternation in the active verbal paradigm of some forms. In addition to the expected *u* ablaut in these forms, they also unexpectedly contain an initial *m*. The relevant data are repeated here for convenience.

(20) *Compound Ablaut in Active Verbal Paradigm*

	Unaffixed	*Active*	*Gloss*
a.	bəbah	mubah	'split (stative)'
b.	bəbəd	mubəd	'tie'
c.	bənuʔ	munuʔ	'kill'
d.	pəpah	mupah	'hit, whip'
e.	pəpək	mupək	'a whip'

A crucial observation here, due to Blust (1997), is that all of the forms to which compound ablaut applies contain a labial plosive in initial position. Given the account so far, these forms are predicted to surface as normal ablauting forms since their verbal stems contain schwa in the initial syllable, resulting in, for instance, *bubah*, *bubəd*, *bunuʔ*, etc. However, such surface forms are routinely avoided in favor of outputs which have initial *m*, rather than initial *b* or *p*.

My proposal is that such forms involve a coalescence of two segments; specifically, the prefix-initial *m* and the stem-initial labial plosive in each case. I will show below that this coalescence, which violates the faithfulness constraint UNIFORMITY arises in order to satisfy a higher-ranking faithfulness constraint. Before elaborating on this point, however, let us focus on the phonetic restriction involved in cases of compound ablaut. Clearly the sequence *mu* favored over the sequences *pu* or *bu*. As discussed by Blust (1997), in morphologically complex forms the sequence *mu* is widespread, arising from prefixation. However, in morphologically complex forms, one never finds *pu* or *bu*. This provides evidence for an OCP-type constraint against sequences of a labial obstruent followed by a round (labial) vowel. This constraint is called *BU.

(21) *BU

The sequence of a labial obstruent followed by a labial vowel is prohibited.[3]

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[3] It might be advantageous to view this constraint as a local self-conjunction of the markedness constraint *LAB, with the local domain specified as either the syllable or the prosodic word. As pointed out by Kazutaka Kurisu (p.c.), this move could provide an explanation for the relative ranking between the conjoined constraints *LAB^2 and *COR^2, following Spaelti's (1997) Universal Conjoined Constraint Ranking Hypothesis (UCCRH). According to Spaelti, if the ranking $C_\alpha \gg C_\beta$ holds, then so must the ranking $C_\alpha^2 \gg C_\beta^2$. Given the universal markedness harmony scale *LAB $\gg$ *COR, the ranking *LAB^2 $\gg$ *COR^2 follows by the UCCRH, and need not be stipulated. For an account of OCP effects analyzed as self-conjunction of featural markedness constraints, see Alderete (1997). Ito & Mester (1998) provide a conjunction-based analysis in their account of Japanese sequential voicing effects. Crucially, for the Mukah case at hand, other constraints may be ranked in between these two self-conjoined constraints. However, this matter is not as simple as generalizing the *BU constraint to a self-conjunction barring adjacent labial segments. Doing so turns out to make the incorrect prediction that compound ablaut should occur when the passive morpheme *ni-* is prefixed to a coronal-initial base, a situation which is never found. Thus I adopt the more specific *BU constraint.

As an aside, such cases provide further evidence for the ranking between σ-ALIGN and MAX, since the fixed prosodic-conforming output surfaces. Relevant correspondence relations are indicated with subscripted numerals.

(22)   *Fixed prosody prevails*

/m_1u_2-$b_3ə_4b_5ah$/	σ-ALIGN	MAX
a. $m_1ə_2b_3ə_4b_5ah$	*!	
☞ b. $m_{1,3}u_2b_5ah$		*

Returning now to the issue of coalescence, we note that the fixed prosodic constraint must dominate UNIFORMITY.[4]

(23)   UNIFORMITY (McCarthy & Prince 1995)

No element in the output has multiple correspondents in the input.

With UNIFORMITY dominated by σ-ALIGN, coalescence takes place in order to meet fixed prosodic requirements.

(24)   *Fixed prosody prevails yet again*

/m_1u_2-$b_3ə_4b_5ah$/	σ-ALIGN	UNIFORMITY
a. $m_1ə_2b_3ə_4bah$	*!	
☞ b. $m_{1,3}u_2b_5ah$		*

In the optimal candidate (b), the stem-initial b_3 has coalesced with the prefix-initial m_1 to yield $m_{1,3}$. Notice that this merger of the two segments is contingent on their sharing place features: they are both labial. Thus, the constraint OO-MAX-PL is satisfied in the optimal candidate, since the labial place features of both the prefix-initial *m* and the base-initial *b* are preserved. This will prevent compound ablaut from taking place with no restrictions: it is limited to strictly those cases in which the verbal stem happens to begin with a consonant of the same place of articulation of the active voice prefix. There is, however, another important candidate to consider: one in which the prefix-initial *m* and the base-initial *b* coalesce into a *b*. This candidate satisfies OO-MAX-PL, yet such a candidate does not surface (*bubah*). However, this candidate is ruled out by the markedness constraint *BU.

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[4] See Pater (1999) for an account of coalescence in Austronesian that involves the constraint LINEARITY:

LINEARITY (McCarthy & Prince 1995)

The input is consistent with the precedence structure of the output, and vice versa.

Although I do not address this issue further, it is not clear that coalescence violates LINEARITY, since under McCarthy & Prince's definition LINEARITY is violated only when precedence relations are reversed. Whether coalescence involves a reversal of precedence relations seems unlikely. What seems more plausible is that coalescence results in a loss of precedence relations. For this reason, I adopt UNIFORMITY as the constraint violated by coalescence.

(25) *Non-coalescence vs. coalescence*

/m_1u_2-$b_3ə_4b_5$ah/	OO-MAX-PL	*BU	UNIFORMITY
a. $b_1u_2b_5$ah	*!	*	
b. $b_{1,3}u_2b_5$ah		*!	*
c. $m_1u_2b_5$ah	*!		
☞ d. $m_{1,3}u_2b_5$ah			*

Candidate (a) violates OO-MAX-PL, since the [labial] feature of the stem-initial b_3 has no correspondent. Candidate (b) satisfies OO-MAX-PL, yet violates *BU. Candidate (c) is like candidate (a) with respect to its fatal violation of OO-MAX-PL but is phonetically identical to the optimal candidate, which violates only relatively low-ranking UNIFORMITY. Compound ablaut is thus analyzed as a way to both avoid the sequence bu or pu by being faithful to the features of the stem-initial consonant.

6. Conclusion

The following ranking diagram summarizes the analysis presented here:

(26) *Final Ranking*

```
                    PPN
                     |
                  OO-MAX-PL
                     |
    *BU            σ-ALIGN
        \         /   |   \
      UNIFORMITY   IDENT  MAX
```
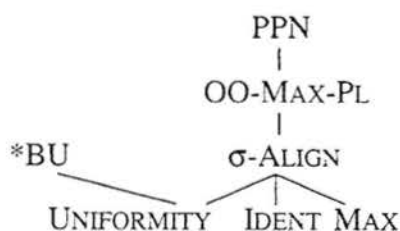
We have examined a case of fixed prosody in the Austronesian language Mukah Melanau. As we have seen, this language exhibits an interesting allomorphy in its active and passive verbal affixation. The two main allomorphs we have been concerned with involved prefixation on the one hand, and ablaut on the other. A subset of ablauting forms presented an additional puzzle: labial-initial bases show compound ablaut in the active paradigm.

Our analysis made use of several well-motivated faithfulness constraints. In particular, high-ranking OO-MAX-PL forces preservation of featural specifications of verbal stems, which is ultimately responsible for restricting the effects of fixed prosody to cases of stems whose initial vowel is schwa. In such cases, the fixed prosodic constraint σ-ALIGN takes effect, limiting words to two syllables.

The fixed prosodic effects we have observed in Mukah are widespread within a particular morphological domain: that of active and passive affixation in the verbal paradigm. However, such fixed prosody is not observed with other affixational material in the language, at least, not according to the available data. Rather than viewing this as a weakness of the analysis presented here, however, I claim that this scenario in a consequence of the underlying forms of affixes in general in the language. Given the data in Blust (1988), all affixes in this language are prefixes (and in some cases, infixes). However, this is not the sole generalization that appears to hold on affixation.

It is also the case in Mukah that affixes contain at most one syllable.[5] The typology of affixal segmentism is represented below:

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[5] One example containing a bisyllabic prefix *talə-* is given, though no meaning is explicitly attributed to it.

(27)   Affixational segmentism

C(ə(C))-

That is, all affixes are prefixes that consist of either a single consonant, or a consonant followed by the vowel ə, or a sequence of CəC. The important generalization regarding these affixes, which contrasts to the affixes discussed at length in this paper, is that they all contain the vowel schwa underlyingly.

By contrast, the underlying forms of the active and passive morphemes, as seen earlier, are *mu-* and *ni-*, respectively. These differ in that they crucially have full vowels specified in their inputs. This essential difference explains why ablaut occurs in the cases of the active and passive morphemes but not with any other morphemes in the language. If any affix did have a vowel other than schwa then the account here predicts that an ablauting paradigm would result, under the proper phonological circumstances: namely, when the affix is attached to a stem with schwa in its first syllable. Thus the fact that ablaut is observed only in the active and passive paradigm can be explained as a consequence of underlying representation, and supports the distinction in underlying specification.

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Categorial Change in Oceanic Languages: First Contact on the

North New Guinea Coast

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One of the most remarkable differences that one notices as one thumbs through

dictionaries of Western Austronesian languages like Tagalog and Indonesian and

those of Western Oceanic languages of the north coast of New Guinea like

Gedaged (Mager 1952) and Yabem (Streicher 1982) is the relative lack of

precategorial roots in the latter. Given that precategoriality is a striking feature of

other Oceanic languages, especially the conservative languages in the Central-

Eastern Oceanic subgroup like Fijian (Dixon 1988) and argued convincingly for

Polynesian languages like Tongan (Broschart 1997), it would appear that these

Oceanic languages of the New Guinea north coast are innovative in this aspect. In

this paper I will trace the developments that led to this change in typology, but

first I wish to discuss what I mean by precategoriality in AN languages and revise

the reconstruction of the clause structure of Proto-Austronesian in the light of this

idea.

In Foley (1998) I presented an analysis of Tagalog as a precategorial

symmetrical voice language. The gist of this analysis is as follows. Most Tagalog

roots are precategorial, i.e. not assigned to lexicosyntactic classes of Noun or

Verb, just unspecified, X. Whether a given root is to function referentially or

predicationally is determined by its functional head, D or I respectively, of which it is the complement within a DP or IP phrasal projection. D is drawn from a set that contrasts proper versus common and also case, much like German determiners:

(1)

```
        DP                              DP
         |                               |
        D'                              D'
       /  \                            /  \
      D    X                          D    X

      sa   lalake                     ni   Maria

   COMMON  man                     PROPER  PN

   OBL                             CORE

   'to the man'                    'by/of Maria'
```
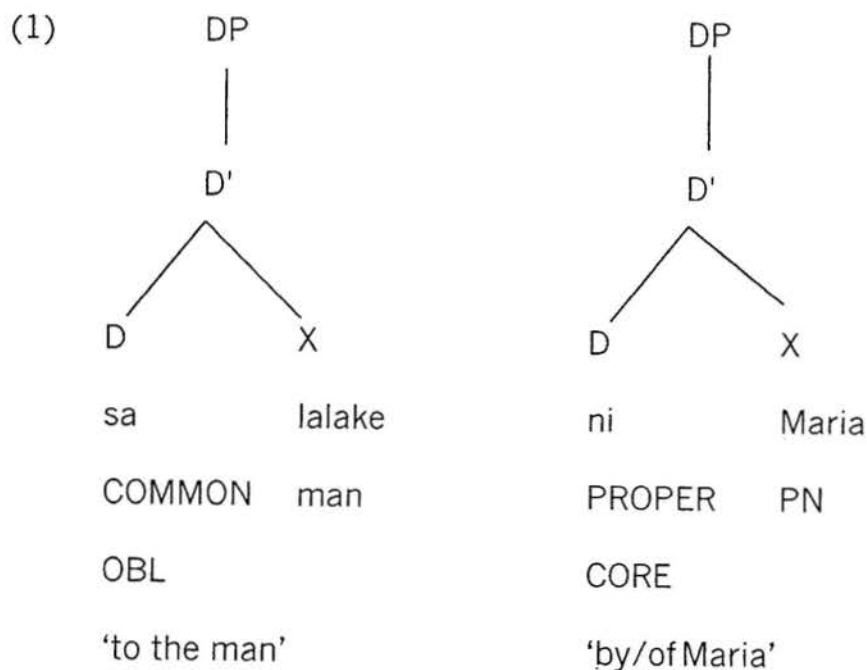
The I head is more complex. First because the roots are not verbs, they do not take argument structures, so that first they must be derived as verbs with their respective array of argument structures. This is accomplished by a set of voice affixes, commonly called 'the focus affixes', which not only derive a verb and its associated argument structure, but also select one of these arguments as the clausal PIVot and assign grammatical functions appropriately:

272

(2) *bigay* s-structure: X   cause   Y   to have Z

                  [+A]   [-A]

  bigay-an   a-str   <X, Y, Z>

    gr-str: CORE CORE PIV

      D: ng   ng   ang
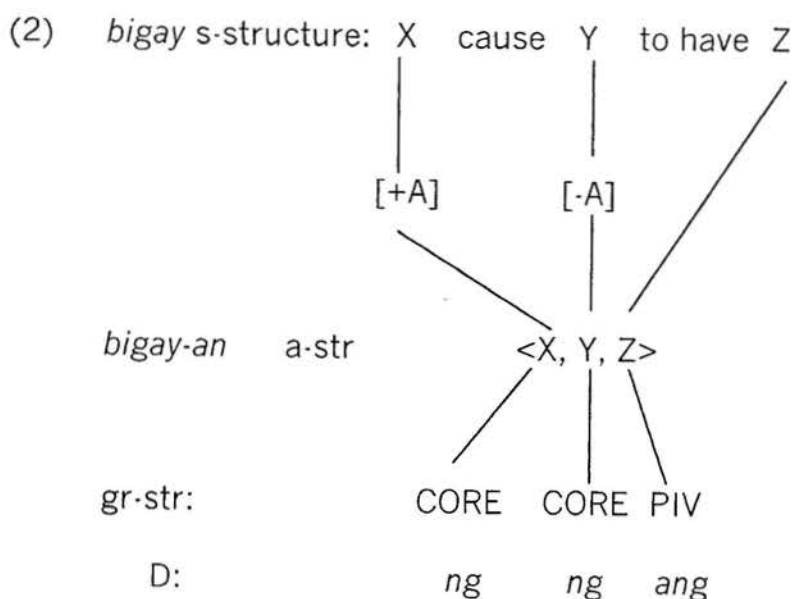
The structure of a verb derived so and its associated DPs, arguments and not, in traditional terms, an S, are what are specified for I. The I takes the full S as its complement. The I may be realized by what is commonly called an AUXiliary, in which case the verb of the S appears in a non-finite form, i.e. without I inflection:

(3)   huwag   mo-ng   tawag-in   ang   duktor
      don't   2SG CORE-LIG   call-UV   PIV   doctor

    'Don't call the doctor'

Note the pronoun *mo* 2SG CORE occurs as an enclitic to the AUXiliary *huwag* 'don't' and precedes the verb *tawag-in* 'call s. o.' that governs it. This is a typical feature of Tagalog: CORE and PIVot pronouns, as well as a number of particles are specified as enclitics to an I head:

273

(4)
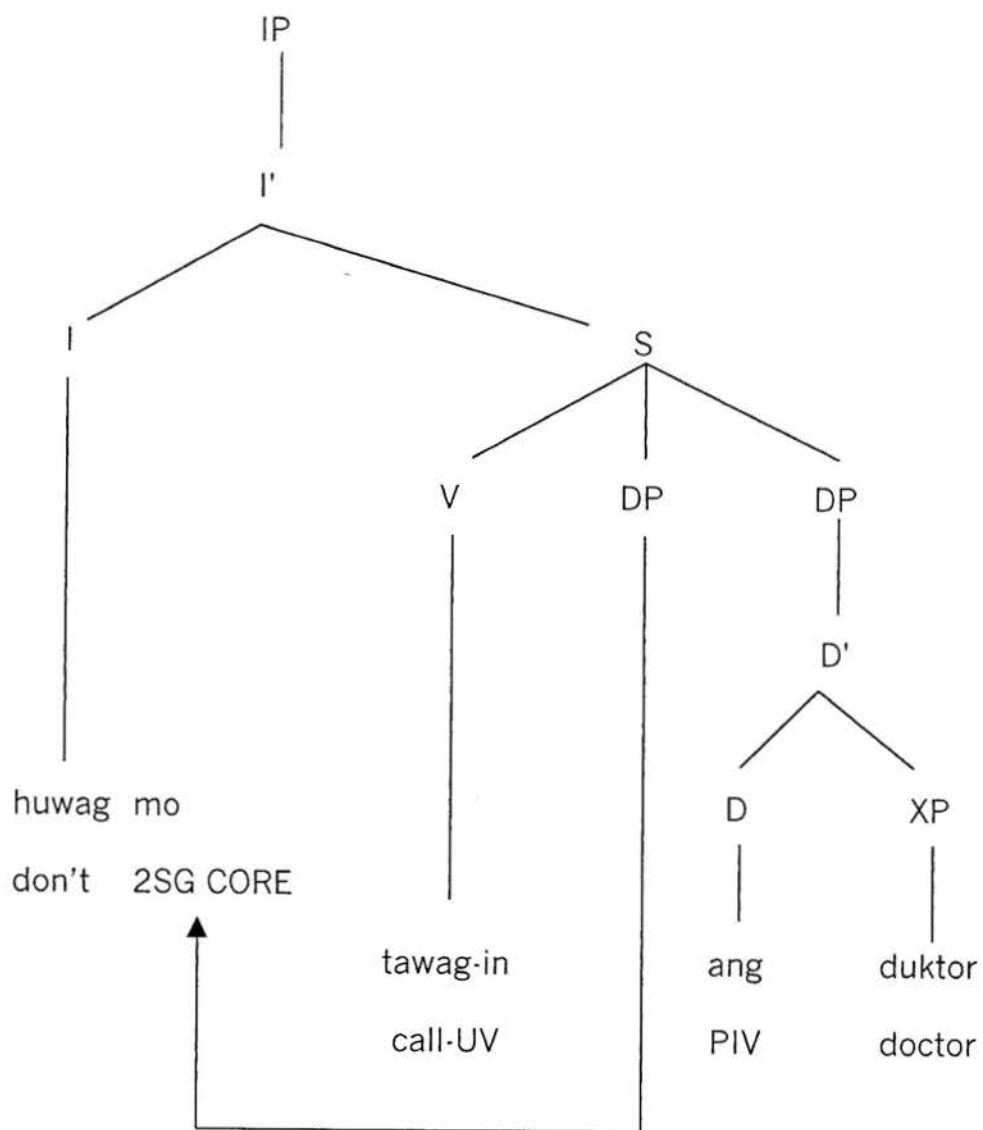
However, verbs can be directly inflected for I, i.e. be finite, along a dimension of a mood contrast, realis versus irrealis, and within realis, for aspect, imperfective versus perfective:

(5)   non finite (-I): O

                              IRRealis: REDuplication of #CV of root

                                            IMPERFective: -in- +REDuplication of root
            finite (+I)
                         REALis

                                    PERFective: -in-
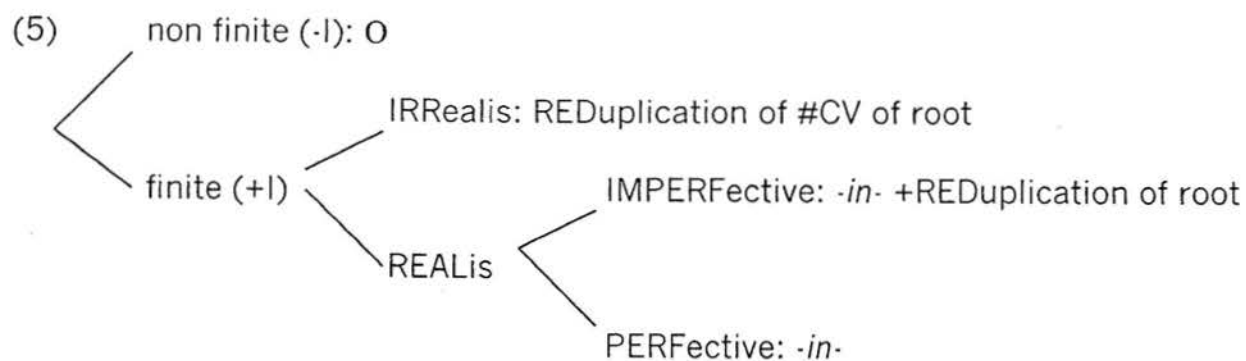
When the verb is inflected for I there is no AUXiliary, and it must occupy the I

head position of the IP in order to meet requirements of feature compatibility:

(6) (a)   p-in-atay-O   ko   ang   abogado
           PERF-kill-UV   ISG CORE   PIV   lawyer

      'I killed the lawyer'

(6) (b)

```
                                IP
                                |
                                I'
                               /  \
                              /    \
                            I        S
                            |       /|\
                            |      / | \
                  p-in-atay-O   ko  V  DP   DP
                  PERF-kill-VC  1SG CORE        |
                                                D'
                  [+I]                         /  \
                                              D    XP
                                              |     |
                                             ang  abogado
                                             PIV   lawyer
```
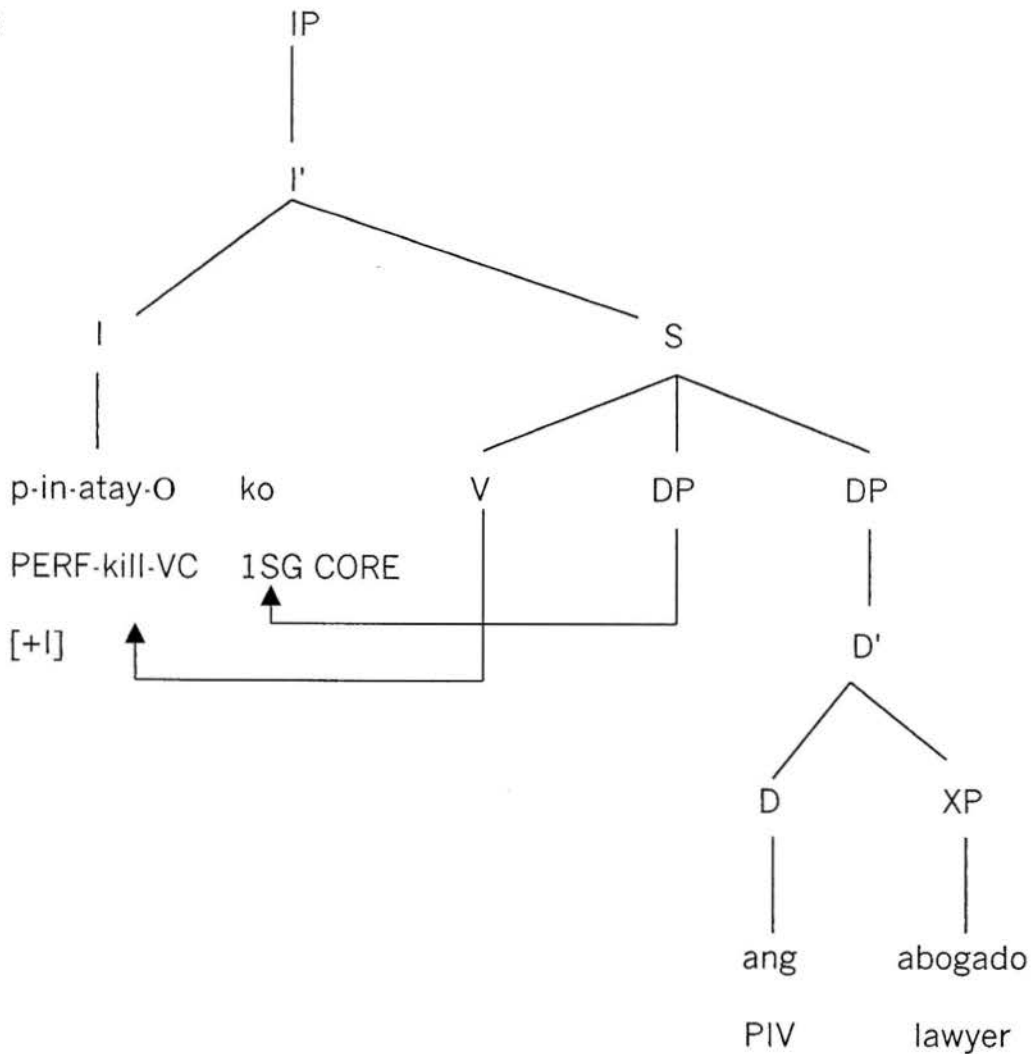
It is a well known fact about Tagalog that it allows fully inflected verbs to
behave nominally, i.e. be referential, as in (7):

(7)   p-in-atay-O   ko   ang   nag-a-abogado
        PERF-kill-VC   1SG CORE   PIVE   IMPERF.VC-lawyer

        'I killed the one becoming a lawyer'

In the terms of this analysis, this is simply a DP with an IP complement and in

fact is the general structure of relative clauses in the language. Relative clauses

in Tagalog like those of Western Austronesian languages generally are formed by

276

deletion: the DP within the IP relative clause coreferent with the head is deleted. But of course the argument structure of the verb of the IP must be satisfied and this is assured by stipulating that only the PIVot DP of the relative clause may be the relativized constituent (note that the PIVot DP, being specified by the voice affix on the verb, is the only fully recoverable argument) and further that the D of the higher DP projection bind it (Jelinek and Demers 1994):

(8)

```
                        DP
                        |
                        |
                        |
                        D'
                   ____/  \____
                  /            \
                 D             IP
                 |             |
                 |             |
                 Z             I'
                 |           _/ \_
                 |          /     \
                 |         I       DP
                 |                 |
                 |                 |
                 |                 Z
                 |                 PIV
                 |                 ▲
                 |___binds_____|
```
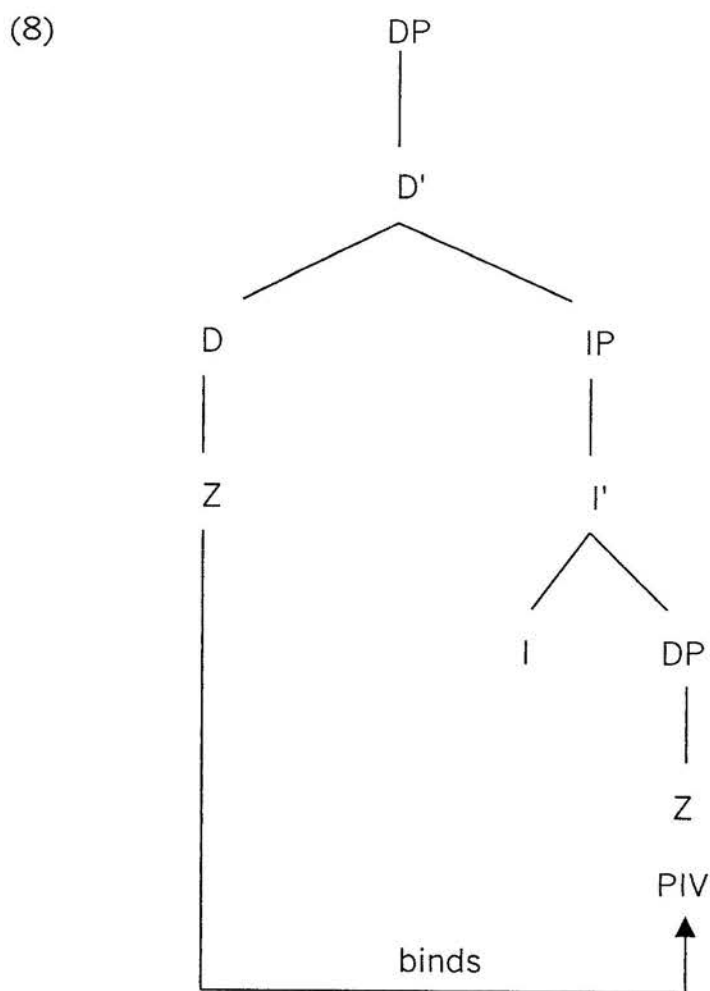
For the DP in (7) the structure is:

(9)

ang *nag-a-abogado*

```
                    <X>                    'the one becoming
                     |
                    PIV              a lawyer'

          DP        [+DEF]
           |
           P'       [+I:IMPERF]

       D                    IP

      ang

    [+DEF]                   I'

              I                      S

                                   V        DP

       nag-a-abogado                         |
                                             X
      'X is becoming a lawyer'

              <X>                            X
               |
              PIV
               |
            [+I: IMPERF]

                    binds
```
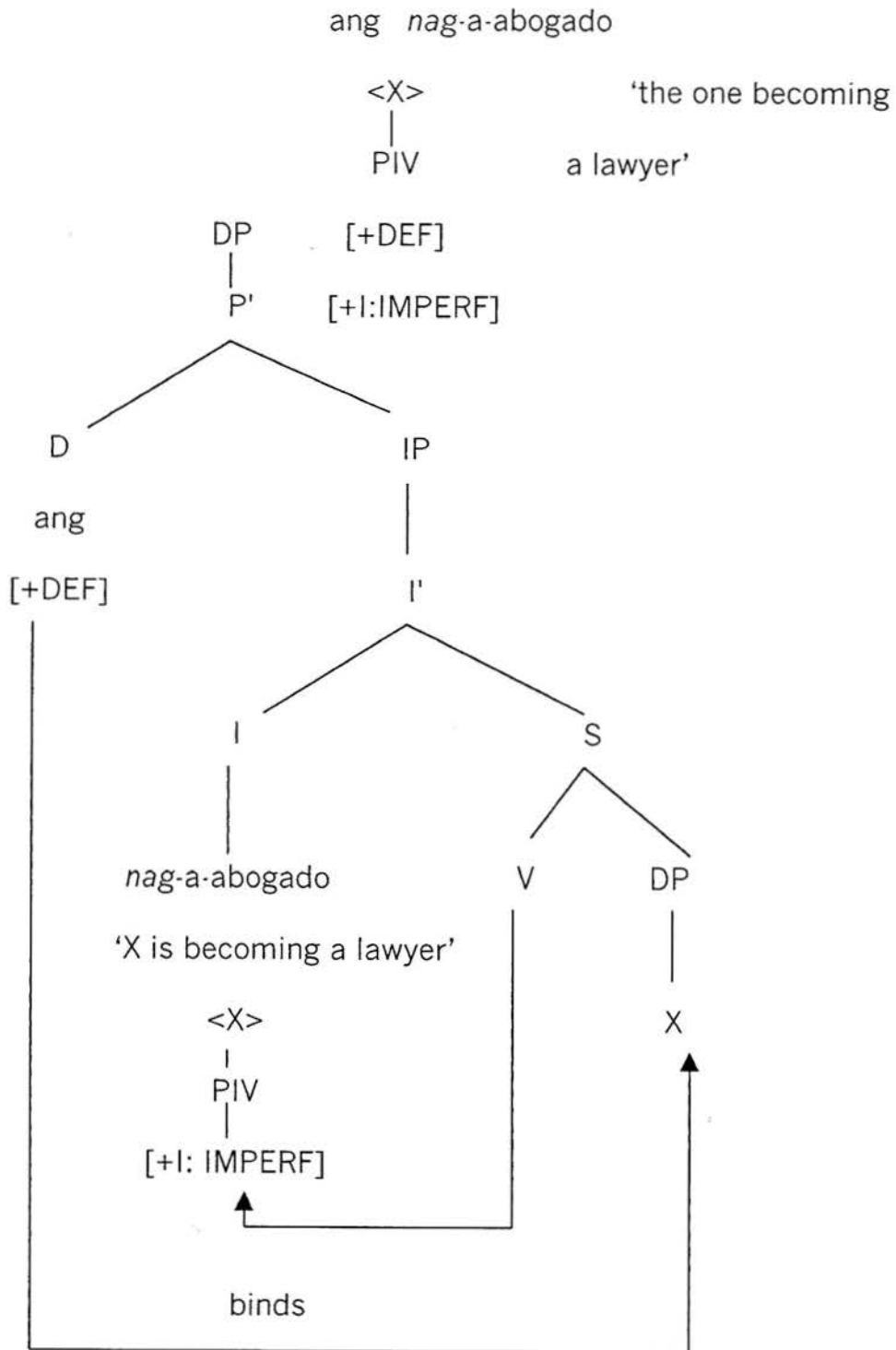
It is clear when investigating diverse languages of Taiwan drawn from varying first

order subgroups of Austronesian like Atayal (Egerod 1965, 1966; Huang 1993,

1995), Paiwan (Egli 1990; Ferrell 1982), Pazeh (Blust 1999) and Tsou (Starosta 1985; Szakos 1994; Tung 1964; Zeitoun 1992, 1993), that a system much like that of Tagalog can be reconstructed for Proto-Austronesian (see Ross 1995; Wolff 1973), with a few notable amendments. First the AUXiliary system seems much more robust in Taiwan languages and was likely so in PAN. Indeed Ross (1995) reconstructs a set of atemporal voice affixes, i.e. nonfinite [-I] forms, which followed AUXiliary I heads: Actor PIV: O, Undergoer PIV: -u (~ a) Locative PIV: -i. Tsou has taken the robust AUXiliary system to its logical conclusion: all IPs are headed by an overt AUXiliary (Zeitoun, Huang, Yeh, Chang and Wu 1996):

(10) (a) moso   bonö   to   tacömö /o   amo
          PAST.AV   AV.eat   CORE   banana PIV   father

'Father ate a banana'

(b)   i-ta   ana   /e   tacömö
     PROG.nAV-3SG CORE   act.UV   PIV   banana

'He has been eating a banana'

279

(c)

```
                              IP
                              |
                              I'
                      _____|_____
                     |                 |
                     I                 S
                    i-ta          _____|_____
                                 |     |     |
        PROG.nAV-3SG CORE        V     DP    DP
               ▲                 |     |     |
               |                 |     |     |
               |                ana    |     D'
               |                       |    /  \
               |               eat.UV  |   /    \
               |_____|  D      X
                                          |      |
                                          |      |
                                         /e    tacömö

                                         PIV   banana
```

It should be noted that Tsou's n-AV voice affixes descend from the atemporal

series. This is to be expected if the basic IP type that survived into this language

was that headed by AUXiliaries and the IPs headed by I inflected verbs were lost.

Interestingly, however, as the paradigm collapsed, the AV affix was drawn from

the neutral verb series (see below) a development which has gone to completion

in Tagalog, where the neutral forms have taken over the role of the atemporal non-

finite set entirely. Tsou seems a local development; PAN was much more

probably like Tagalog with AUXiliary-headed and AUXiliary-less IPs illustrated by

Atayal (Huang 1993; Zeitoun et al 1996):

(11) (a) m-ihiy-saku/   tali/   hiva/
           AV-beat-1SG PIV   PN   yesterday

       'I beat Tali/ yesterday'

         (b)   wan-su/   m-ihiy   sayun
           AUX:PAST-2SG PIV   AV-beat   PN

       'You beat Sayun'

In addition to the non-finite forms which followed AUXiliary I heads (with

secondary uses as plain imperatives and clause chaining dependent verbs (Egli

1990; Ross 1995), to be discussed below), PAN appears to have had a verbal

system inflected for I in a manner not too different from Tagalog. There was a

neutral verb form derived from the root simply by the voice affix, AV: *-um-, UV:*-

«n- ~*O, and LV: *-an. It is not clear what the actual semantics of these forms

was, having no overt realization of I, but they could be inflected for aspect, in a

way already familiar from Tagalog.

                    PERF: -in-

       neutral

                    IMPERF: REDuplication
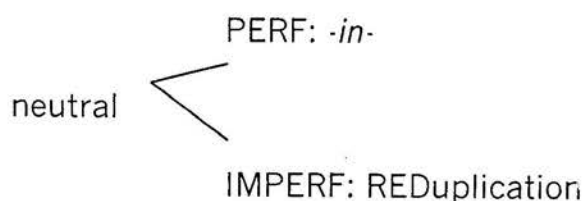
Finally, there was a set of forms labelled by Ross (1995) as projective,

derived from the atemporal, non-finite set by the addition of a suffix -a preceding

the non-finite voice affixes, -O, -u and -i. It is not clear whether these forms were

truly finite (i.e. inflected for I) or a second set of non-finite forms derived from the

atemporal forms by a process of insubordination (Evans 1993). Their semantics

281

is clearly in the irrealis range, intention, possibility and exhortation, so that latter proposal seems likely: modal or irrealis forms often arise from non-finite embedded forms that have lost their embedded status. In any case both the projective and atemporal series are lost in Tagalog; the former neutral series takes over the function of being the non-finite form. Table 1 drawn from Ross (1995) presents his full reconstruction of PAN verbal inflection:

Table 1: PAN Verbal Inflection

		AV	UV	LV
Non-finite	atemporal	O	·u(~·a)	·i
[·I]	?projective	(·um·)+·a+O	aw<·a+·u	ay<·a+·i
Finite	neutral	·um·	·«n	·an
[+I]	PERFective	·um· + ·in·	·in· + O	·in· + ·an
	IMPERFective	·um· + RED	RED + ·«n	RED + ·an

Another difference concerns the behavior of the enclitic pronouns. In PAN, their encliticization to the I head seems to have been optional, although it is obligatory in many daughter languages. Their optional encliticization in PAN is witnessed by Rukai in examples like the following (Ross 1995):

(12) wa·kan«·aku

      PAST·eat·1SG PIV

      'I ate'

The prefix *wa·* PAST is derived from the PAN AUXiliary **ua* PAST (cf Atayal *wan* PAST in (11b) above) which has become procliticized to the verb. Note that the pronominal DP *aku* 1SG PIV follows the verb rather than occurring between the

AUXiliary and the verb where we would expect it if encliticization to the AUXiliary was obligatory. This argues that encliticization was optional in PAN and either remained optional or was lost in Rukai, but became obligatory in many daughter languages.

Another important difference between Tagalog and probably PAN concerns the headless relative clause structures or nominalizations illustrated in (9) and analyzed here as DP over IP structures. In Tagalog and most Western Austronesian languages including many Taiwan languages like Paiwan these are restricted to IP complements headed by I inflected verbs. PAN appears to have allowed such structures to be formed on IPs headed by AUXiliaries. In Tsou these are the only DP over IP constructions, as would be expected given its constraint requiring IPs headed by AUXiliaries (Starosta 1985):

(13) (a)   ic/o   na   oh-to   ei/m-l
              that   D   AUX-1PL CORE   live-LV

        'That's where we live'

(b)

```
                        DP
                        |
                        D'
                      /    \
                    D        IP
                    |       /   \
                   na      I      S
                 [+DEF]    |    /   \
                          oh·to V    DP    DP
                     AUX-1PL CORE  |      |
                                 ei/m·i    X
                                 live-LV

                                 binds
```
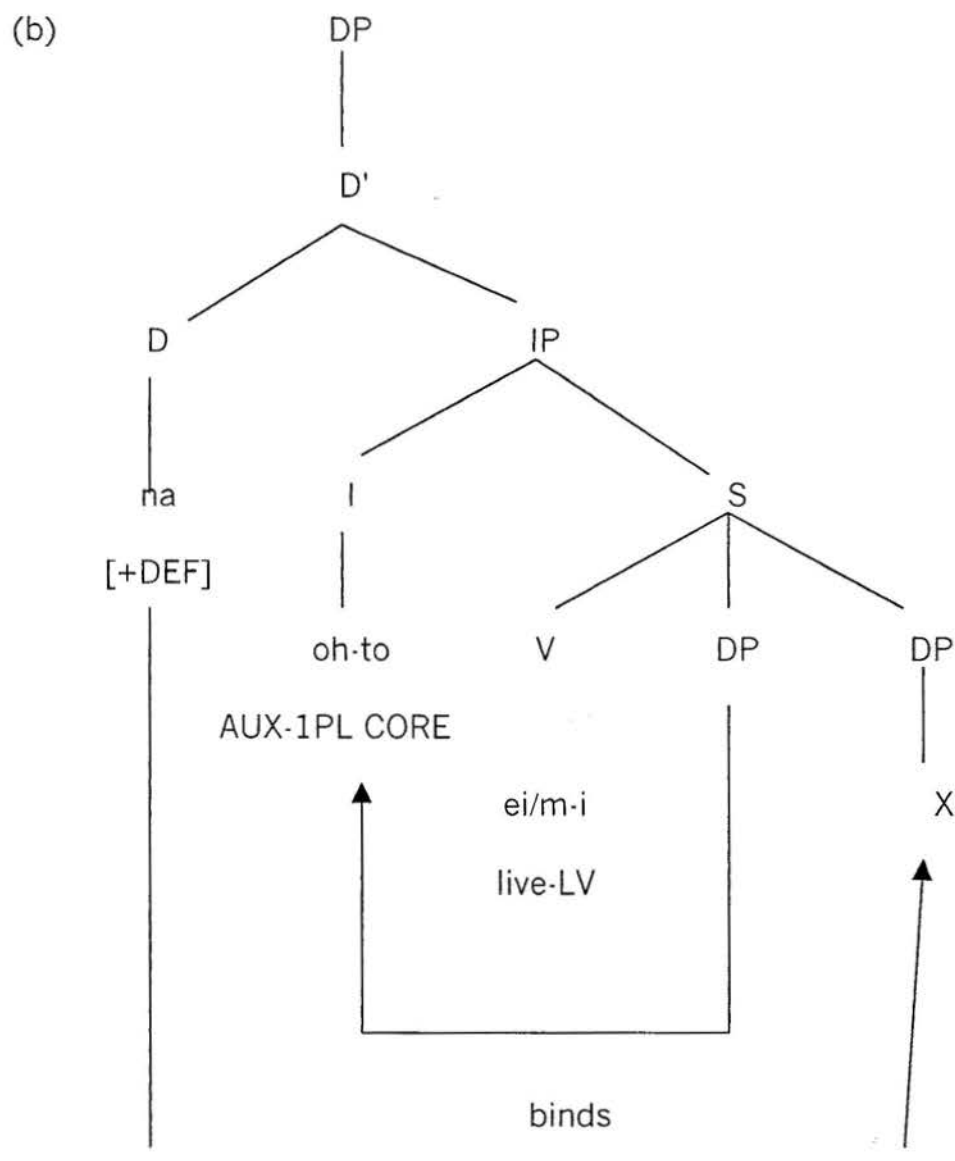
Remarkably, however, in addition to the usual structures, such as (13b), DP over

IPs headed by I inflected verbs, are also found in Atayal, a language of a different

highest order subgroup in Austronesian, strongly suggesting that structures like

these must be reconstructed for PAN as well.

Finally, in marked contrast to languages like Tagalog and Indonesian, in

which the same affixes can be used in different ways on roots to derive forms
which can function referentially or predicationally:

(14) -in: lagnat 'fever':   lagnat-in 'have a fever'

           awit (um-awit 'sing'):   awit-in 'song'

     -an   tukod 'cane: tukur-an 'use as a cane'

           hiram (h-um-iram) 'borrow';   hiraman 'place for borrowing'

it is a notable fact that Taiwan languages seem especially rich in derivational
affixes (Blust 1999: Ferrell 1982). In contrast to the Tagalog situation illustrated
above, some of these seem restricted to deriving either a verbal or a nominal
form. For example in Pazeh (Blust 1998, 1999), the prefix *sa-* derives IV voice
verbs:

(15)   sa-talek   alaw   ki   bulayan
        IV-cook   fish   PIV   pan

     'The fish was cooked with a pan'

And through a nominalization by DP over IP structures, referential expressions
like : *hiud* 'fish', *sa-hiud* 'fishing pole'; *kuxus* 'scrape' *sa-kuxus* 'scraper'; *tabuk*
'peck', *sa-tabuk* 'bird's bill'. However, there is another affix consisting of
reduplication of the initial C of the root followed by the vowel *a* that also derives
referential expressions describing instruments, but in this case is *never used as a
verbal voice affix*:

(16)

hium	'blow on'	hahium	'bamboo tube for blowing on fire'
kuxus	'scrape'	kakuxus	'razor'
bizu	'write, draw'	ba-bizu	'letter'
kawas	'say'	ka-kawas	'words'
buba	'kill with poison'	ta-tuba	'fish poison'

(compare sa-tuba 'store bought poison

for rats')

As this affix Ca- is widespread in Taiwan languages and indeed found in other AN languages outside Taiwan, it must be reconstructed for PAN, and with it a contrast between referential expressions derived by a DP projection over IP complements and simple nominal derivation by affixation. This does not change the status of precategoriality in PAN: the roots must be derived to function referentially/nominally or predicationally/verbally, but it does indicate that D heads projecting a DP phrase were not the only way to derive referential expressions in PAN. Tagalog and Western Austronesian languages of like ilk seem to have moved from the flexibility of PAN into increasing reliance on functional heads and phrasal projections; hence the lack of obligatory D heads in languages like Atayal and Pazeh versus their pervasive presence in Tagalog.

To summarize our findings so far: PAN was a strongly left-headed language, dominated by DP and IP phrasal structures. Roots were precategorial and required derivation to function referentially or predicationally, and this was

286

commonly accomplished syntactically through being complements of the proper functional heads, D (referential) or I (predicational). I heads could be realized syntactically through the use of AUXiliaries or morphologically, by inflecting the verb for I, in which case the verb occupied the I head position. Pronominal DPs were always encliticized to the I head; if that was an AUXiliary, then they occurred between the AUXiliary and the verb. It is not clear if all CORE pronouns encliticized or only those denoting the Actor, especially when the PIVot was a non-Actor. Clearly the latter case was the strongest target for encliticization, as all languages allow or require encliticization, in this case. The form of the non-PIVot Actor pronominal DPs when encliticized was identical to that of the forms marking possession, as indeed generally non-PIVot Actor and possessive DPs are formally identical.

In the transition from PAN to Proto-Oceanic (POC) a number of major grammatical changes occurred. The basic sentence type with an AUX as I head and a non-finite atemporal verb survived into POC, but the sentence types with I inflected verbs serving as head were lost. The PAN AV atemporal form now became the intransitive clause type, while in the transitive clauses the UV atemporal verbs in *-a (~ *-u) merged with the form in *-i, leaving the PAN LV atemporal form as the basic transitive clause type. (17) exemplifies the normal clause types in Pre-POC:

(17)   Pre-POC clause types

ITR:	AUX	PRO	V	(DP)	
TR:	AUX	PRO	V-*i	DP	(DP)

The PRO forms could be either non-PIVot actor forms (morphologically identical to possessive pronominals) or the PIVot forms: in modern Oceanic languages the so-called subject proclitic pronominals can be descended from either of these sets, different languages exhibiting differing ancestry. However, given that there was no longer any productive voice system, the PRO always referenced the actor/subject DP. By POC, the AUX element is lost; hence the difficulty of reconstructing the POC tense-aspect-mood system noted by Ross (1988). This left the old enclitic pronominal now a proclitic to the following verb, and in addition in transitive clauses new pronominal enclitics referencing the object were innovated from older independent pronominal DPs:

(18) POC   clause types

    ITR: PRO-V   (DP)

    TR: PRO-V-*i-PRO   (DP) (DP)

These changes had an especial impact in embedded clauses. With the loss of I inflected verb heads as an option in main clauses, these structures in embedded clauses in former DP over IP structures now became islands. As the transparency of the I inflection here was lost, it was no longer possible for speakers to identify them as IPs, i.e. relative clauses:

(19)
```
              DP
              |
              |
              D'
             /  \
           /      \
         D          XP
         |          |
         a          X
                    |
                    V-in-erb (DP)
```
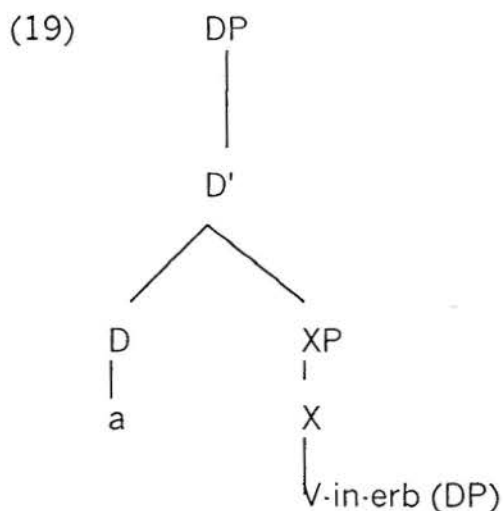
This had two effects. First new ways of forming relative clauses had to be

innovated, and with the loss of a productive voice system, the restriction on PIVot

only relativized DPs had to be dropped. Modern Oceanic languages mostly

relativize DPs in situ leaving PROnominal copies. Secondly, because the XP was

no longer categorically identifiable on its own, but the whole constituent was, as a

DP, i.e. semantically referential, the formerly I inflected word was now reanalyzed

as a normative complement of a D head, i.e. a referential word, in short a derived

noun. What had formerly been an I inflected verb in PAN, now became a derived

noun in POC (note this sequence is exactly the opposite of that proposed in

Starosta, Pawley and Reid (1982)), so that by the time of POC a clear word level

category of noun had emerged, and this process of nominal derivation through

formerly verbal affixes remains productive in conservative Oceanic languages like

Tolai: (Mosel 1984) and Nakanai (Johnston 1980):

(20) (a) Tolai

       momo 'to drink'   m-in-omo   'a drink'

       mate 'to die'   m-in-at   'death, corpse'

       tata 'talk'   t-in-ata   'word, language'

       ian 'eat'   ni-(i)an   'food'

       kukul 'buy'   k-un-ukul   'buying'

a	k-un-ukul	na	kar	ka-i		ra	tutana
D	NOMLZ-buy	LIG	car	POSS	CLSF-POSS	D	man

'The buying of the car by the man'

(b)   Nakanai

       taga 'afraid'   t-il-aga   'fear'

       vago 'to pole a canoe' v-il-ago   'a pole'

       peho 'die'   p-il-eho 'a corpse'

       pou 'sit'   p-ul-ou   'stay'

la	p-ul-ou	tamiteu	kama	taritigi
D	NOMLZ-sit	POSS 1PL EX	NEG	good

'Our stay wasn't good'

However, in spite of this innovation of a word level lexicosyntactic category of noun, it is clear that very strong features of precategoriality remained in POC, as it does in most modern Oceanic languages, in that prototypically nominal roots can freely be used predicatively without derivation as exemplified by Tolai (Mosel 1984):

(21)

(a)	a	kaliku	i	ga	boroi	lua
	D	snake	3SG S	REM	pig	before

290

'The snake "pigged" (i.e. became a pig) before'

(b)	tuk	i	ga	pui	vanavana	mulai
	until	3SG S	REM	bush	by and by	again

'Until it by and by "bushed" again'

'Until the bush grew again'

The opposite, the use of underived prototypically verbal roots as referential DPs is rarer, due no doubt to the innovation of derived nouns by reanalysis of the older I inflected verbs. Yet it does appear: again Tolai (Franklin, Kerr and Beaumont 1974):

(22) (a)	a	tutana	i	ririvon
	D	man	3SG	dream

'The man is dreaming'

(b)	a	ririvon	i	tar	kaina
	D	dream	3SG	PERF	bad

'The dream was bad'

This contrast is buttressed by Mosel's point (1984:136) that English nouns borrowed into Tolai are frequently used predicatively, but borrowed English verbs are not used referentially. However, as productivity of the processes deriving nouns from prototypically verbal roots declines, we might expect more robust precategoriality to reemerge, and this is indeed the case in Oceanic languages like Fijian and Tongan (Broschart 1997).

A few words on wider typological issues are in order here. PAN was and POC remained a strongly left headed language. Precategoriality seems particularly well adapted to left headed languages in that the functional head which instructs

how to take the following XP, predicationally, referentially (or even attributively, a topic beyond my scope here), always occurs first, a clear processing advantage, a claim buttressed by the fact that crosslinguistically strong precategoriality does seem particularly salient in language families strongly of a left headed structure, Salishan, Wakashan, Austronesian, as witnessed by the literature going back to Boas (1911) on this topic. In fact we can go further and contrast the typical left headed language with DPs to right headed languages (e.g. Latin) with NPs or KPs. The claim is that in right headed languages, processing constraints make D functional heads which follow precategorial XP complements dysfunctional:

(23) *   DP
           |
           D'
          / \
       XP   D
       | |
       X
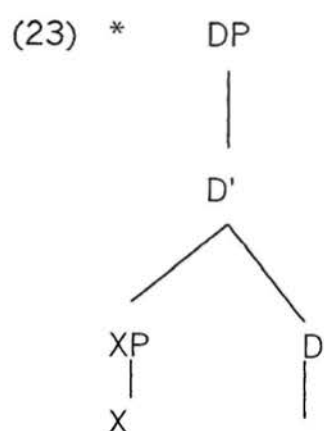
Or in optimality theoretical terms this is a very highly ranked constraint. In fact, a very widespread, but weaker constraint is that right headed languages don't much like DPs at all and overwhelminlgy across the globe, with high statistical reliability, there is an inverse correlation between right headed typology and DPs, as witnessed by strongly right headed families like Classical Indo-European, Uralic, Altaic, Japanese, Australian, Sino-Tibetan, Andean. Furthermore, as right headed languages have NPs rather than DPs, they typically have a robust contrast

between noun and verb roots, necessary so that the proper NP phrase can be projected from the syntactic N heads. The possibility of precategoriality in languages with KPs, i.e. the phrase is headed by a K category, a case suffix, enclitic or postposition which takes a precateorial XP complement has not yet been investigated and cannot be ruled out a priori, although in such cases it seems difficult to see how a principled distinction between K and D categories could be drawn.

When we turn to IP structures, somewhat the opposite picture emerges. Right headed languages from diverse families across the world are characterized by clause chaining, a pattern in which clauses headed by morphologically stripped down verbs precede ones headed by a fully inflected verb, from which the previous verbs take their specifications for these I features. Watam of the Papuan Lower Sepik-Ramu family illustrates:

(24) Watam (NAN: Lower Sepik-Ramu)

waut	nakan	i	mbo	ga-r	saNga-r
stone	big	a	LOC	climb-DEP	go-DEP

timoN	an	Ng-utki-r	ak-ri
on top	this	FOC-stand-DEP	call out-PAST

'(he) climbed up a big rock and stood on top of it and called out'

In this example only the final verb is specified for tense, i.e. I, by -ri PAST. The previous verbs simply mark their dependence through -r. A straightforward analysis here is that the tense is the I head with takes a complex complement, i.e. a number of conjoined S nodes:

(25) (a)

```
                    IP
                    |
                    I'
              _____|_____
             |                       |
             S                       I
       _____|_____                 |
      |      |      |              Tense
      S      S      S
     / \    /|\    / \             MOOD
    NP  V  NP NP V NP  V
                                    IF
```

(b)

```
                         IP
                         |
                         I'
                    _____|_____
                   |                              |
                   S                              I
          _____|_____            |
         |         |         |        |           |
         S         S         S        S          -ri
        / \        |        / \       |
      PP   \       |       NP  V      V         PAST
     /  \   \      |       |   |      |
    NP   P   V     V       |   |      |
    |    |   |     |       |   |      |
  waut nakan i mbo ga-r  saNga-r timoN an Ng-utki-r  ak-
  stone big  a LOC climb-DEP go-DEP on top this FOC-stand-DEP  call out
```

294
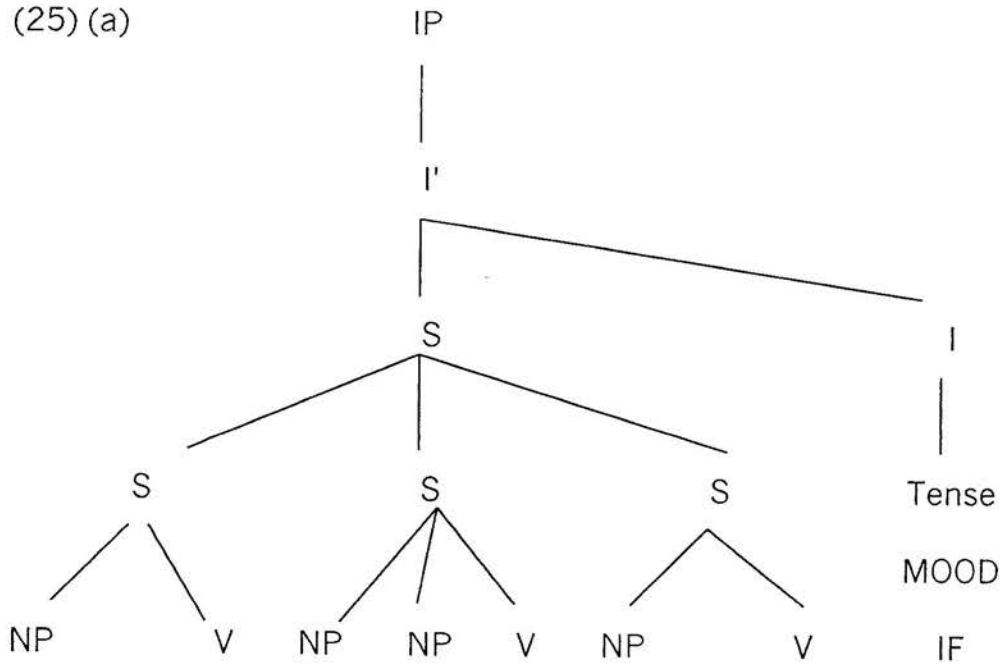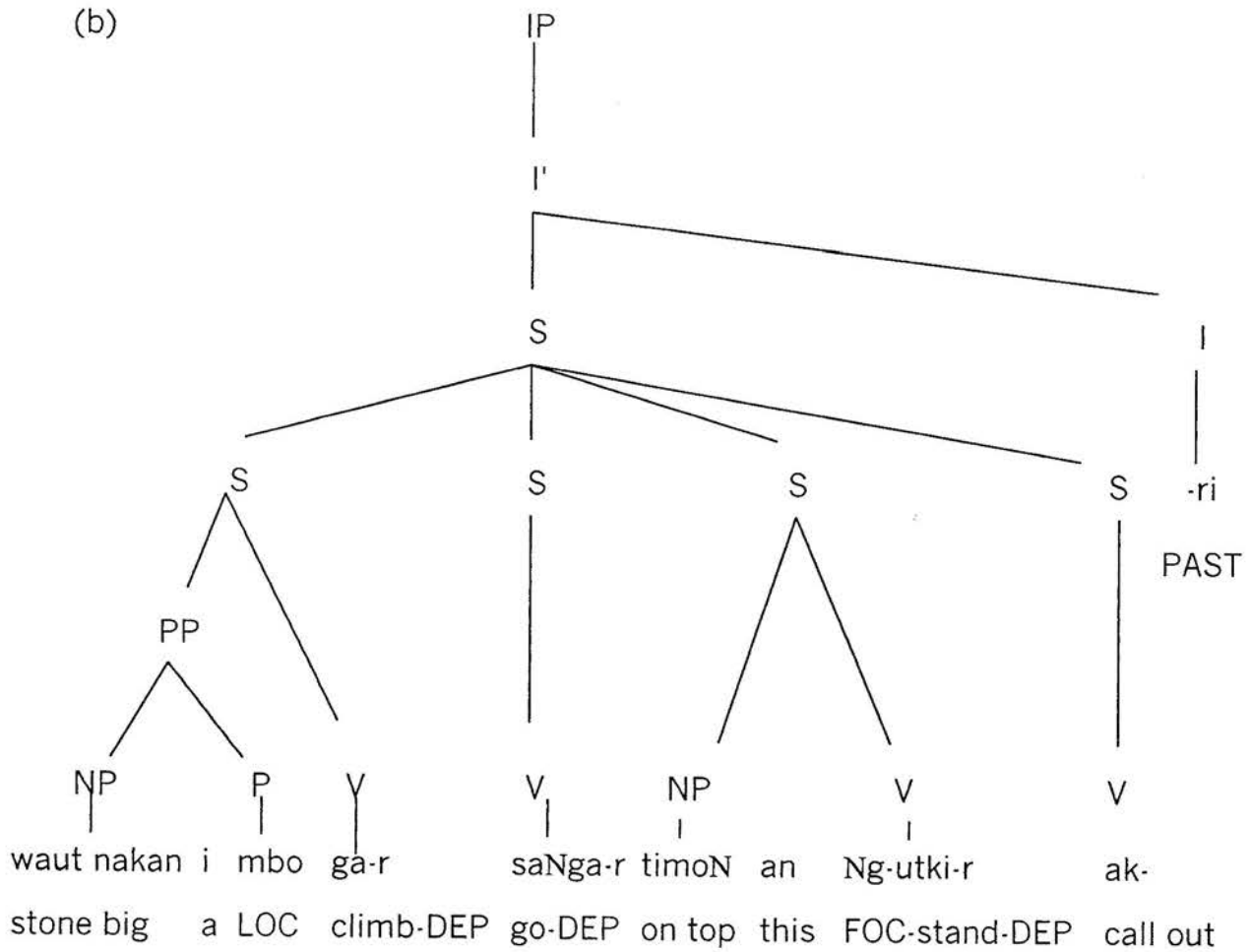
The structure here is simplified; it is certainly necessary to posit layers of more deeply embedded I heads with circumscribed scope relations (Foley and Van Valin 1984; Cinque 1998), as well as lower level narrow scope I categories like aspect within the individual S constituents, but the above does give a clear idea of the overall structure. Now structures like (24) and (25) are strongly disfavored in left headed languages. While there are a few left headed AN languages that have analogs of clause chaining like Paiwan in Taiwan (Egli 1990) and some Oceanic languages in Southern Vanuatu (Crowley 1998; Lynch 1983), it is quite rare and is not reconstructable for PAN or POC. Overwhelmingly AN languages link clauses headed with fully inflected verbs or AUXiliaries through paratactic coordination or subordination. Clause chaining is simply not in their grain and again this is true of strongly left headed language families like Salishan, Wakashan, or Mayan. Again the following structure is highly dysfunctional or in OT terms, a very highly ranked constraint.

(26)   *   IP
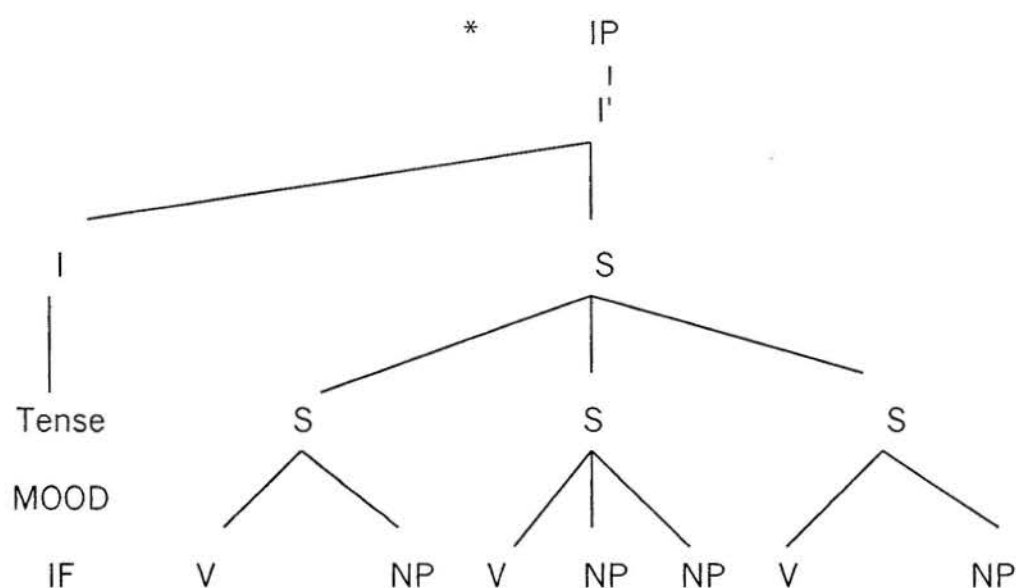
The only place in the domain of the AN languages where non-Austronesian languages survive is the region around New Guinea, where some 800 such languages are spoken. The north coast of New Guinea in particular is densely populated with hundreds of non-Austronesian (NAN) languages and has been so for some 40,000 years. While belonging to a number of language families, all languages of this region, with the exception of those of one family (the Torricelli family, not of much relevance to my topic here) are characterized by a strong right headed typology. All have a sharp noun/verb root distinction, lack DPs and exhibit extensive clause chaining-all prototypical features of right headed languages and all lacking in POC, a strongly and consistent left headed language. Oceanic speakers, however, have been in the region of the north coast of New Guinea for some three millennia (Spriggs 1997) and have long term ongoing and often intense trade and cultural relations with their NAN speaking neighbors, causing in many cases significant shifts in the typological profile of the Oceanic languages in the region.

Essentially there seem to be two outcomes, what I will call strip or convert. The strip solution I will dispose of rather quickly, as it is of less interest to my main concern. This is the case in which the language undergoes simplification during the process of converging with adjoining typologically divergent languages. Adzera (Holzknecht 1986) in the upper Markham river valley, in close contact with Trans New Guinea languages illustrates this well. While POC were already

morphologically rather simple, Adzera improves on this profile. All clitic pronouns are lost, as well as the transitive verb suffix *-i. The verbal structure, however, remains strongly left headed, with proclitics and prefixes to mark I, with a minimal obligatory contrast between REALis and IRRealis. The category of D is completely lost (this is general along the north coast, undoubtedly due to its lack in neighbouring NAN languages) and with it DPs. NPs now emerge as a basic syntactic category. What distinguishes whether a given root is to be taken referentially or predicationally, is the presence of I marking in the latter case, but, as expected, precategoriality is completely lost, in sharp contrast to Tolai, not to mention Tongan or Tagalog. What is especially notable is the extension of productive nominalization from the old PAN LV affix -an (Adzera -(d)a(n)) to uses of non-finite nominalization totally atypical of OC languages that preserve these, but widespread among NAN languages:

(27

(a)   non-finite relative clause (note preserved left head structure)

(i)   garam   [is-a   yafas]
        man   catch-NOMLZ   fish

        'a fisherman'

(ii)   nam   [nu/-an]
        food   cook-NOMLZ

        'cooked food'

(b)   non-finite complement

(i)   araNan   i-ni   [ba-dan]
        3SG   REAL-say   come-NOMLZ

        'He wants to come'

(ii)   dzi   i-ni   rut   in   i   [ba-dan]

dzi	i-ni	rut	in	i	[ba-dan]
1SG	REAL-say	together	3SG	first	come-NOMLZ

'I first told him to come'

The OC languages along the coast of Madang Province exhibit the convert
solution, taken to varying degrees of completion, in other words they have shifted
in the direction of the right headed typology of their NAN neighbors. As expected,
the functional head D (and consequently DPs) disappears in all these languages,
given its dysfunction in right headed languages, but the real focus of interest are
changes affecting the IP. Manam (Lichtenberk 1983) represents the more
conservative development. Here the clausal constituent order has switched to the
canonical SOV pattern of right headed languages:

(28)

tamóata	bóro	di-tao-táon-i
man	pig	3PL S REAL-RED-hunt-3SG O

'The men were cahsing the pig'

And the language has postpositional PPs in contrast to POC's prepositional
phrases: *bía /ana* beer because 'for a beer'. The nominalizer -(N)a derived from
PAN *-an is also in evidence in Manam, and like Adzera is used to form non-finite
complements, but it is not used in non-finite relative clauses. Beyond this,
however, there is little shift. The IP structure remains strongly left headed (see
(28) above) with the verbal structure inherited from POC little changed: I
categories are prefixal and there are proclitic and enclitic PROnominals. In spite
of the right headed clausal structure, clause changing structures are not
innovated: it appears the left-headed verb puts pay to that. Manam conjoins

clauses together, each headed by a fully inflected I specified verb. There are, however, very incipient signs of things to come in that the conjunction *be* 'and' becomes encliticized to the fully inflected verb preceding it. Bound conjunctive suffixes in dependent verbs are a salient feature of clause chaining structures.

(29) tamóata   bóro   di-tao-taon-í-be
      man   pig   3PLS REAL-RED-hunt-3SG O-CONJ

      áine   réga   di-/oto-/óto-O
      woman   firewood   3PL S REAL-RED-break-3PL O

'The men were chasing the pig and the women were gathering firewood'

Precategoriality, while rare from Lichetenberk's description, as fully expected from the language's semi-shift to a right headed typology, is attested. For example there is a root *nanari* which can be used as in intransitive verb 'tell a story' or the noun 'story' as in the possessive construction

(30) nanari   ne-gu   nanari-ta/-a-gu
      story   CLSF-1SG POSS   story-TR-NOMLZ-1SG POSS

      'my story' (I told)   'my story (about me)'

But this is rare; it appears even robustly categorially vague words like 'rain' are resolutely categorial in Manam:

(31) (a)   úra   i-púra
           rain   3SG S REAL-come

      'It started to rain'

     (b)   natu   /ategísi   i-púra   (compare (21))

              child   teacher   3SG REAL-come

      'His son (literally 'child') became a teacher'

Examples like (30) should perhaps be analyzed then as lexical exceptions, rather

than representing precategoriality in the language.

Finally, the Bel subgroup of languages spoken around Madang has shifted most strongly in the direction of neighboring right headed NAN languages (Ross 1987). These share the innovations noted above for Manam, but have become canonical right headed languages, with structures that look for all the world like clause chaining (Ross 1994). The crucial innovation that seems to have made these possible is the shift from prefixal to suffixal I inflection, i.e. the IP projection is clearly, unambiguously right headed (the mood inflection, REALis versus IRRealis appears to be the highest I category in these AN languages, in contrast to many TNG languages it which this is illocutionary force. It is the position of the highest I category that determines the head typology).

(32)

(a) Gedaged (Dempwolff n.d.)

> tamol i-l(a)-e
>
> man   3SG S-go-REAL
>
> 'The man went'

(b)   Takia (Ross 1987)

> panu   na   N-au   wa
> village   OBL   1SG S-go   IRR
>
> 'I shall go home'

Interestingly, the contrast between IRRealis and REALis PROnominal prefixes, salient in Manam and so pervasive in the Oceanic languages of the New Guinea region, is lost in the Bel languages in favor of modal suffixes or enclitics, bringing the language wholly into line with a right headed typology. Clause

chaining appears to emerge, with the typical Madang area pattern of mood
inflection for dependent verbs:

(33) Takia (Ross 1987, 1994)

> (a) iN   i-marsi-go fud   i-ani   a
> 3SG   3SG S-sit-REAL banana   3SG S-eat REAL
>
> 'He sat and ate a banana'
>
> (b) iN   i-marsi-pe fud   i-ani   wa
> 3SG   3SG S-sit-IRR   banana   3SG S-eat IRR
>
> 'He will sit and eat a banana'

While these structures look NAN, the actual DEPendent verb markers, -go

REAL and -pe IRR are clearly of AN vintage, -pe IRR being cognate with Manam -be

'and' in (29) above (Ross 1987). The system, however, is clearly calqued, for

such a contrast in dependent verbs is pervasive in Madang area languages of

diverse families:

(34) (a)   Watam   (NAN: Lower Sepik-Ramu)

> (i) ma   birka-r   naNas   Ng-amb-ri
> 3SG   sit-REAL banana   FOC-eat-PAST
>
> 'He sat and ate a banana'
>
> (ii) ma   birak-mbe naNas   Ng-am-na
> 3SG   sit-IRR   banana   FOC-eat-FUT
>
> 'He will sit and eat a banana.'

(b)   Bargam (Hepner 1995) (NAN: Trans New Guinea)

> (i)   leh-ad i   ekton-y-auq
> go-REAL   1PL   yell-IMPERF-1PL S
>
> 'As we were going, we were shouting'

301

(ii)	ni	leh·eq	i		ninmen	karuw	araq
	2SG	go-IRR	1PL	2SG.DAT	meat	a	

wil	em·O·am
hit	do-FUT-1PL S

'If you go, we will kill a pig for you'

In addition, as is typical of NAN languages, the dependent verbs may be marked for relative tense/aspect by suffixes which immediately follow the verb, but precede the DEPendent marker:

(35) Takia (Ross 1987)

(a)	iN	fud	ta			i·ani·du·go	Nai
	3SG	banana	a		3SG S·eat·SIM·REAL	1SG	

	you	Na·luk	a
water	1SG S·drink	REAL	

'He was eating a banana while I was drinking water'

(b)	Nai		N·ani·gu·p	panu	na	N-
au	wa					
	1SG	1SG S·eat·SEQ·IRR	village	OBL	1SG S·go	IRR

'I shall eat and then go home'

(c)	tamol		di·ani·na·g	i·sida	ya
	man	3SG S·eat·DUR·REAL	3SG S·enough	REAL	

'The men ate until they were full'

It is clear that the basic use of these suffixes is aspectual, as is transparent in their use with independent verbs (Ross 1987):

302

(36) Meit   nal   pempem   iN   sa·n   wog   lo
      Mait   day   every   3SG   CLSF·3SG POSS   canoe OBL

      i·sida·na   ya
      3SG S·board·DUR   REAL

'Mait used to board his canoe every day'

While not obvious in Takia, the source of these aspetual suffixes is from earlier serial verb constructions in which the second verb was used as an aspectual modifier, a very common feature of Oceanic languages. Takia's close relative Gedaged exhibits this transparently:

(37) Gedaged   (Dempwolff n.d.; Ross 1987)

            (a) i   mot   i·nau·la·g   me
                 3   snake   3SG S·do·SEQ·REAL   that

            gasaN   lon   i·l(a)·e
            forest   inside   3SG S·go·REAL

'After she gave birth to the snake, she went into the forest'

            (b) o   u·seg·me·g   u·nasi·lak
                 2SG   2SG S·come·SIM·REAL   2SG S·see·PERF

'While you were coming, you saw'
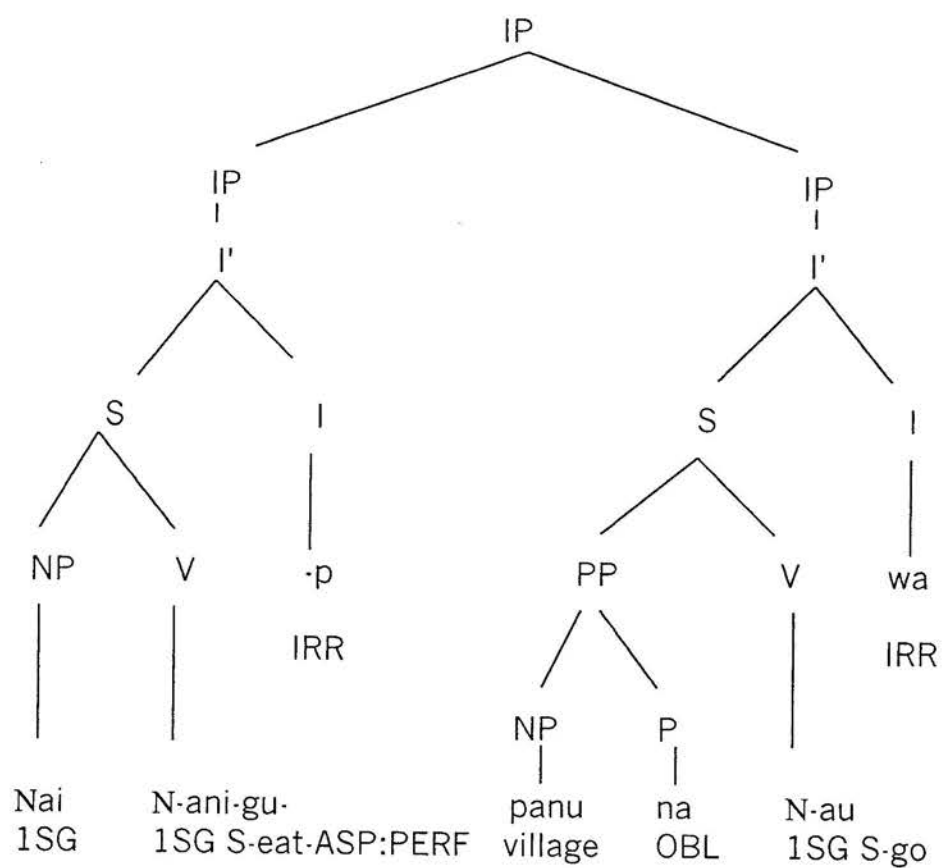
            (c)   pain i   mot   oi   di·e
            di·me
            woman   3   snake   OBL   3PL S·fear   3PL S·IMPERF

Women fear snakes'

Note that the SEQuential form is -la and the SIMultaneous -me. These are undoubtedly identical to the aspectual markers with independent verbs -lak PERF and -me IMPERF, though, interestingly, -lak has become fully integrated as a suffix, while -me remains a verb in its own right in a serial verb construction, as witnessed by its own subject PROnominal marker. Both of these in turn descend from the POC verbs *lako 'go' and *mai 'come' (Ross 1987). But note that in contrast to the canonical Papuan pattern in which dependent verbs are quite stripped down and the morphological patterns of dependent and independent verbs very different, for example, the elaborate tense distinctions in Watam independent verbs are collapsed into a binary mood REALis-IRRealis contrast in dependent verbs, in Takia and Gedaged this is not the case. In these languages, the contrasts made are actually the same, the difference being the formal realization: Takia -p(e) IRR on dependent verbs, wa IRR on final verbs. This suggests that in contrast to the true clause chaining structure of (25) with nested conjoined S nodes within a higher IP projection from a final main I head, these AN structures are really conjoined IPs, each with their own I head:
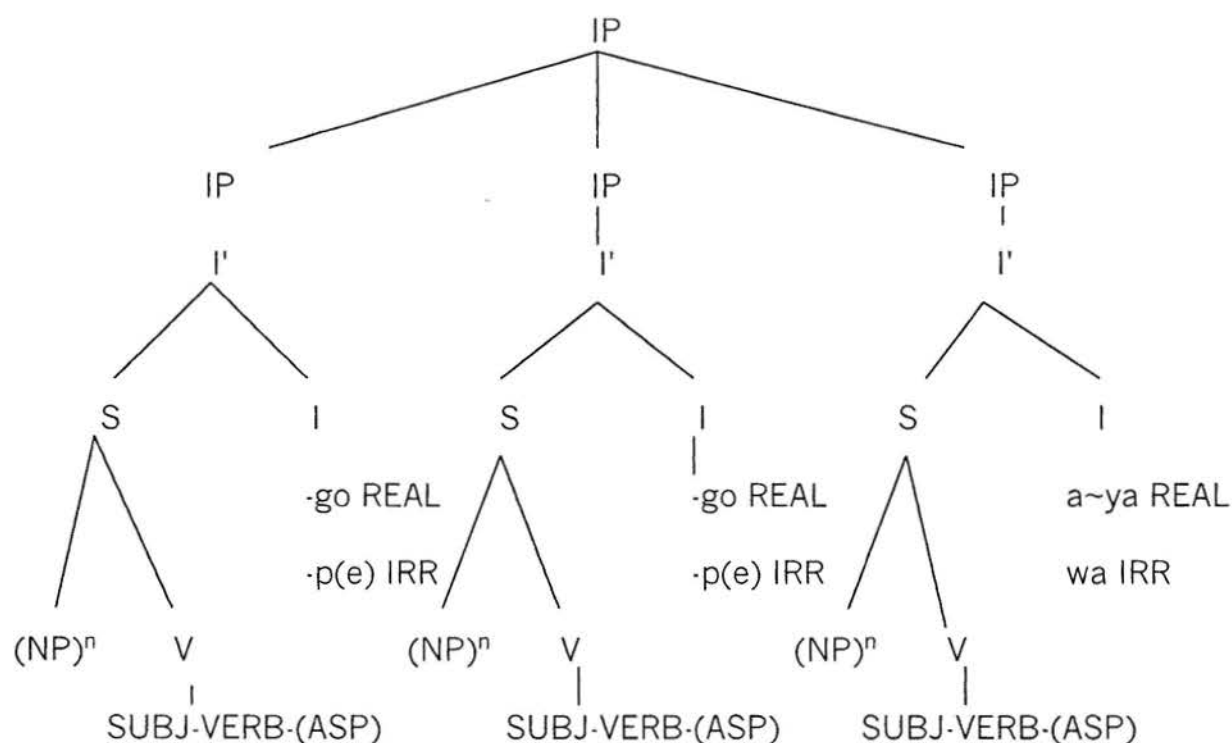
(38) = (35b)

```
                                IP
                    _____
                   |                        |
                  IP                       IP
                   |                        |
                   I'                       I'
                  / \                      / \
                 S   I                    S   I
                / \   |                   / \   |
              NP   V  ·p               PP   V  wa
               |   |    IRR           / \   |    IRR
               |   |                NP   P  |
               |   |                 |   |  |
              Nai  N·ani·gu·        panu na N·au
              1SG  1SG S·eat·ASP:PERF village OBL 1SG S·go
```

'I shall eat and then go home'

or schematically:

(39) (compare 25)

IP
IP IP IP
I' I' I'
S I S I S I
-go REAL -go REAL a~ya REAL
-p(e) IRR -p(e) IRR wa IRR
$(NP)^n$ V $(NP)^n$ V $(NP)^n$ V
SUBJ-VERB-(ASP) SUBJ-VERB-(ASP) SUBJ-VERB-(ASP)

In other words, these are virtual clause chaining structures only, in superficial appearance similar to NAN structures, but in nature different. These are really still structures of paratactically linked conjoined clauses, like those of Manam, with suppletive I heads for non-final versus final verbs (the shift from a conjunction to an I category is itself an interesting phenomenon). It is the shift to final I heads and the thoroughgoing REALis/IRRealis distinction across clauses that is the crucial innovation here and one undoubtedly due to strong pressure from neighboring NAN languages like Bargam. While the clause linkage structures of Bel languages may look Papuan, they are not. They unquestionably betray their Oceanic heritage in their preference for fully I inflected clauses loosely

conjoined. It seems that this a pervasive property of AN typology that is very conservative and not easily given up, even in the face of strong NAN pressure as witnessed by the Bel languages. It would be valuable to compare other cases of language contact between language families of strongly contrastive basic typologies to see what grammatical properties are easily negotiable in these situations and what are not. This would be invaluable data in building informative theories of grammatical structure.