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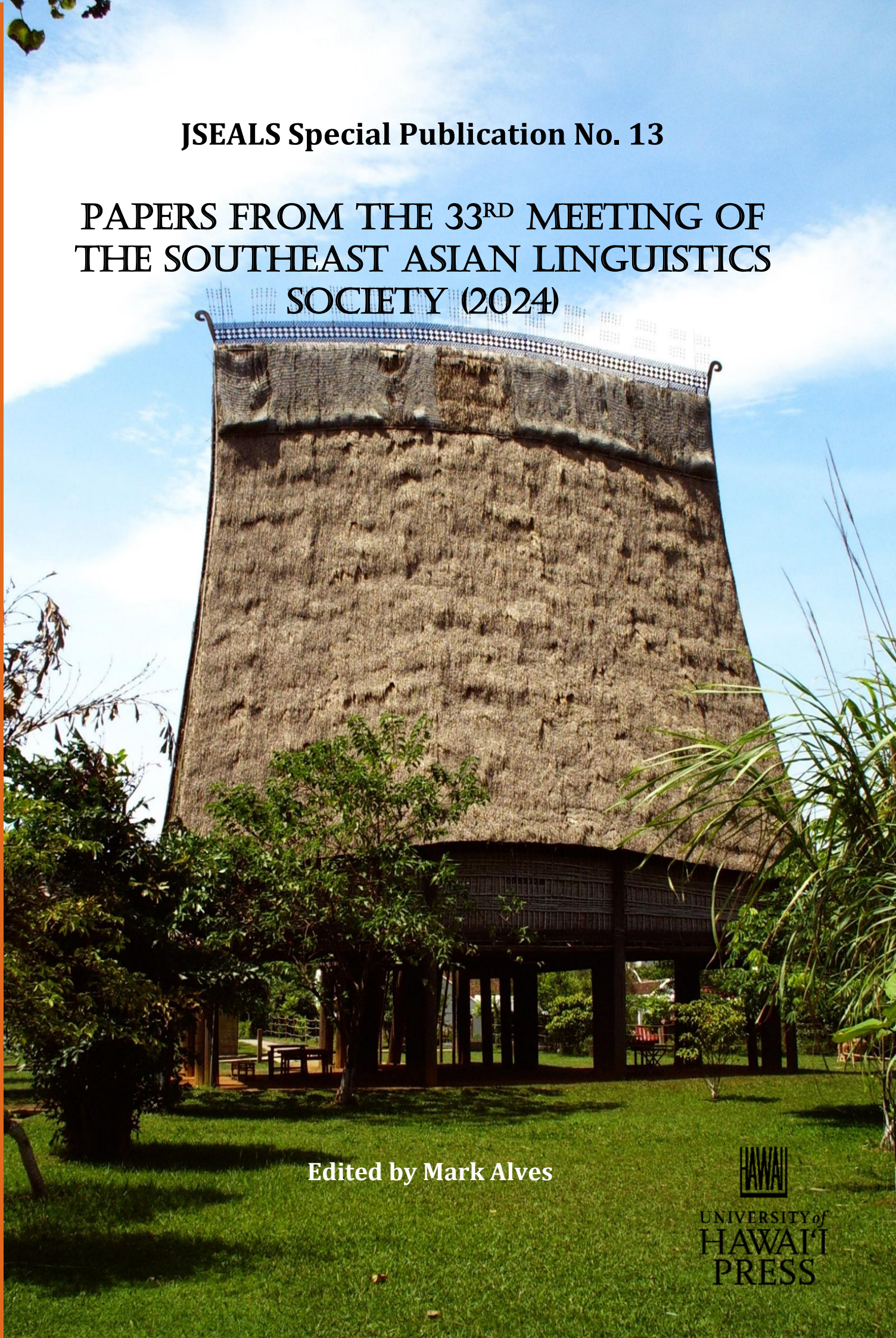

Edited by Mark Alves

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The Journal of the Southeast Asian Linguistics Society publishes articles on a wide range of linguistic topics of the languages and language families of Southeast Asia and surrounding areas. JSEALS has been hosted by the UH Press since the beginning of 2017.

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FROM THE JSEALS EDITOR-IN-CHIEF

This is the thirteenth JSEALS Special Publication. The goal of JSEALS Special Publications is to share collections of linguistics articles, such as select papers from conferences or other special academic events, as well as to offer a way for linguistic researchers in the greater Southeast Asian region to publish monograph-length works.

This publication contains papers of talks given at the 33rd annual meeting of the Southeast Asian Linguistics Society. SEALS 33 was hosted by Tsinghua University in Taipei, Taiwan under the guidance of Dr. Hsiu-chuan Liao from the 15th to the 17th of May in 2024. Dr. Liao also arranged a special workshop on the 18th after SEALS entitled "Workshop on Southeast Asian Linguistics: Language Contact and Historical Relationships of Languages in Southeast Asia", at which several specialists in the field gave talks.

This volume contains nineteen articles: ten on morpho-syntactic matters, three on phonology, five on historical linguistics, and one on sociolinguistics. The languages covered in this volume are spoken throughout the greater Southeast Asian region, including both Mainland and Insular Southeast Asia (and Taiwan), bordering areas of southern China, and the Indian Subcontinent. The studies cover the five main language families in the region: Austronesian, Austroasiatic, Hmong-Mien, Kra-Dai, and Sino-Tibetan/Trans-Himalayan.

We are very pleased that JSEALS is able to support SEALS and to contribute to the sharing of quality linguistic research in Greater Southeast Asia. We look forward to being able to produce such works for SEALS in the future.

Mark J. Alves

May 1st, 2025

Montgomery College

Rockville, Maryland

THE SYMMETRY OF BELAIT VOICE ALTERNATIONS IN NARRATIVE DISCOURSE: PROPERTIES OF THE SUBJECT

Holly DRAYTON
Newcastle University
h.drayton2@newcastle.ac.uk

Abstract
This paper examines two clause types in Belait, Actor Voice and Undergoer Voice, as they occur in naturalistic narrative discourse. Belait voice constructions have been analyzed as two transitive syntactically symmetrical clause types (Clynes 2005). However, there are important asymmetries in their frequencies of use in discourse. This paper considers some of the properties of arguments (subject and non-subject) in Belait transitive clauses to determine which features have an influence on usage asymmetries. I show that properties of the subject only have a minor influence on which clause type is used, and that properties of the event should also be considered as an important factor in which voice construction is used in a particular context.

Keywords: syntax, voice, transitivity, topic, discourse
ISO 639-3 codes: beg

1 Introduction

1.1. Language Background

Belait is an under-studied western-Austronesian language spoken by several hundred speakers in Brunei, north Borneo (Martin 1996; Clynes 2005). Belait is part of the Berawan-Lower Baram language sub-group, which includes at least eight mutually intelligible varieties spoken by communities based along the Tinjar river that runs along the border between Malaysian Sarawak and Brunei (Blust 2010; Smith 2017; Asmah and Norazuna 2020). The map in Figure 1 shows the current locations of Belait speakers in Brunei. Most speakers now live in urban areas along the coast in the Belait district, with another group living in two rural villages in the Tutong district.

Figure 1: *Map of Brunei showing the current locations of speakers of Belait.*

Belait is widely agreed to be severely endangered or moribund due to the low number of speakers and total lack of intergenerational transmission (Martin 1996; Clynes 2005; Noor Azam and Siti Ajeerah 2016). In the 1990s, Martin (1995) reported around 500 speakers. I estimate that, almost 20 years later, that number has reduced by more than half, and there are now probably 100-200 speakers. During my current fieldwork research, the youngest speakers are found to be 60+ years old, with the majority of speakers being 70+ years old.

Other than a flurry of mainly sociolinguistic and some descriptive work in the 1990s and early 2000s (Martin 1995; 1996; 2002; Noor Alifah Abdullah 2004; Clynes 2005; Noor Azam 2005), Belait has received little attention from linguists, and Clynes' (2005) sketch remains the single internationally-accessible descriptive work. The voice system has not been thoroughly investigated, although preliminary description is provided in Clynes (2005) and Noor Alifah Abdullah (2004). Therefore, this research aims to bring the literature on Belait up to date, while increasing our understanding of the Belait voice system within the typology of western-Austronesian voice systems.

1.2. Research Background.

Like other western Austronesian Symmetrical Voice languages, Belait has two transitive constructions: Actor voice (AV) and Undergoer voice (UV). In AV clauses, such as (1a), the Actor, the most agent-like argument, *anaak yieh* 'the child', appears as the subject, while the Undergoer, the most patient-like argument, *nukaan yieh* 'the rice', appears as the object. In UV clauses, such as (1b), the Undergoer appears as the subject, while the Actor occurs as a non-subject core argument. Both clause types are equally morphologically marked with verbal infixes, and appear to be syntactically equally transitive, with two core arguments.

(1a)	*Anaak*	*yieh*	*k-um-aan*	*nukaan*	*yieh*
	Child	DET	<AV>- eat	rice	DET
	'The child eats/ate the rice.'				
(1b)	*Nukaan*	*yieh*	*k-in-aan*	*anaak*	*yieh*
	rice	DET	<UV>- eat	child	DET
	'The child ate the rice.'				

(Belait Corpus: beg011)

Two previous accounts of the Belait voice system present different analyses. While both agree that AV clauses are transitive, active and nominative-accusative, Noor Alifah Abdullah (2004) sees UV clauses as passives, while Clynes (2005) supports a Symmetrical Voice analysis (Himmelmann 2005; Foley 2008; Riesberg 2014).

This paper explores the symmetry of the arguments in AV and UV constructions in narrative texts in order to better understand whether both types are equally transitive and where they vary. Following Hopper and Thompson (1980), I assume that transitivity is not only a syntactic feature, rather it also describes the semantic interpretation of a verb's arguments: hence clauses can differ in their syntactic transitivity and semantic transitivity. I present preliminary findings from new data to show that many of the syntactic properties of Belait AV and UV do appear to be symmetrical – e.g., arguments behave the same way in both clause types suggesting that both clause types are syntactically transitive. However, in terms of discourse features and usage there are important asymmetries between the two clause types, suggesting that UV is lower in semantic transitivity than AV, and shares some semantic features with passives.

Data in this study comes from a small corpus of texts (autobiographical, narrative, oral history, conversational), elicitation and judgements of 7 speakers of Belait, recorded by me 2020-2023,[1] in

[1] I am very grateful for funding from the Endangered Languages Documentation Programme (ELDP), the Firebird Foundation for Anthropological Research and the Leverhulme Trust.

addition to material recorded by Noor Alifah Abdulluh (2004). Recordings are archived with the Endangered Languages Archive (ELAR). [2]

2 Syntactic Symmetry in Belait Voice Alternations

The case for syntactic symmetry in Belait voice alternations is set out in Clynes (2005) for the Kiudang dialect and broadly supported by my own fieldwork with speakers of the Kuala Belait/Kuala Balai variety. I will not go into detail here, but the features are briefly summarized in Table 1. Symmetrical transitivity, morphological marking, definiteness and word order features are demonstrated in examples (1a) and (1b).

Table 1: *Syntactic Properties of Belait voice constructions*

Feature	**AV**	**UV**
Transitive	2 obligatory arguments	2 obligatory arguments
Morphological Marking	Verbal prefix/infix	Verbal prefix/infix
Definiteness	Subject is typically definite	Subject is typically definite
Relativization	Subject only	Subject only
Word Order	Non-subject *typically* follows the verb	Non-subject *must* follow the verb

Regarding word order, an asymmetry is observed: non-subject Undergoer arguments in AV typically follow the verb, shown in (2a) and (2b). However, in certain pragmatically marked contexts, the non-subject Undergoer in AV constructions can occur sentence initially (2c). This order occurs less frequently and can only occur when the Undergoer is highly discourse topical/activated. Nevertheless, it is unambiguously attested in both naturalistic narrative texts and acceptability judgements. Importantly, it is not possible for the Actor to directly follow the verb, either intervening between the verb and Undergoer, as shown in (2d), or alone as shown in (2e). In fact, (2d) and (2e) would both be acceptable with the intended meaning, 'the coconut tree climbs the old man'.

(2a) *Idieh rebbian yieh (ngaa) m-innaad pu'on butien yieh*
Person old DET TAM AV- climb tree coconut DET
'The old man climbs/climbed/will climb the coconut tree.'

(2b) *(ngaa) m-innaad pu'on butien yieh idieh rebbian yieh*
TAM AV- climb tree coconut DET Person old DET
'The old man climbs/climbed/will climb the coconut tree.'

(2c) *pu'on butien yieh idiieh rebbian yieh (ngaa) m-innaad*
Tree coconut DET person old DET TAM AV -climb
'The old man climbs/climbed/will climb the coconut tree.'

(2d) * *(ngaa) m-innaad idieh rebbian yieh pu'on butien yieh*
TAM AV -climb person old DET Tree coconut DET

(2e) **pu'on butien yieh (ngaa) m-innaad idieh rebbian yieh*
Tree coconut DET TAM AV -climb person old DET

(Belait Corpus: beg003)

In UV clauses, similar word order possibilities and restrictions are observed, with an important difference. (3a) demonstrates the most typical UV construction, which is the inverse of the most typical AV construction (2a): The Undergoer argument occurs in the clause initial position, directly followed by the UV-marked verb and then the Actor argument. A variation is also found, shown in (3b). The verb can occur in the sentence initial position, directly followed by the Actor. In fact, in UV clauses the Actor

[2] Examples are labelled depending on the source of the data. Belait corpus refers to my collection which is archived with ELAR (https://www.elararchive.org/dk0662). The numeric label indicates the specific recording.

argument always occurs directly adjacent to the verb and cannot be topicalized, as shown by the ungrammaticality of (3c). This is in clear contrast to AV clauses which allow the non-subject Undergoer to be topicalized in certain pragmatic contexts (2c). Like AV clauses, (3d) and (3e) are only acceptable with the infelicitous meaning, 'the coconut tree climbed the old man.'

(3a)	*Pu'on*	*butien*	*yieh*	*(ngaa)*	*n-innaad*	*idieh*	*rebbian*	*yieh*
	Tree	coconut	DET	TAM	UV -climb	person	old	DET
	'The old man climbed the coconut tree.'							
(3b)	*(ngaa)*	*n-innaad*	*idieh*	*rebbian*	*yieh*	*pu'on*	*butien*	*yieh*
	TAM	UV -climb	person	old	DET	Tree	coconut	DET
	'The old man climbed the coconut tree.'							
(3c)	**idieh*	*rebbian*	*yieh*	*pu'on*	*butien*	*yieh*	*(ngaa)*	*n-innaad*
	Person	old	DET	tree	coconut	DET	TAM	UV- climb
(3d)	**(ngaa)*	*n-innaad*		*pu'on*	*butien*	*yieh*	*idieh*	*rebbian*	*yieh*
	TAM	UV- climb		tree	coconut	DET	Person	old	DET
(3e)	**idieh*	*rebbian*	*yieh*	*(ngaa)*	*n-innaad*		*pu'on*	*butien*	*yieh*
	Person	old	DET	TAM	UV- climb		tree	coconut	DET

(Belait Corpus: beg003)

In summary, neither clause type allows the subject argument to directly follow the verb. In UV, the non-subject argument, the Actor, must always directly follow the verb, while AV is slightly more flexible, allowing the non-subject to be topicalized, non-adjacent to the verb, an order that is impossible in UV. Since both clause types require two obligatory arguments, both can be considered to be transitive. However, the relatively reduced flexibility of UV shows variation.

3 Belait Voice in Discourse

The main focus of this paper is an examination of voice constructions in discourse, based on five narrative texts, which are varied in terms of viewpoint, time reference and genre. Although the sample size is relatively small, the idea is that this preliminary detailed investigation of a small number of texts in will provide an indication of which features are likely to be important. These relevant features can then be explored on a larger scale analysis in future research. The details of the texts are show in Table 2.

Table 2: *Texts included in this study*

Code	**Name**	**Genre**	**Viewpoint**	**Time Reference**
Text A	Travel to Sabah	Autobiographical narrative about a past vacation	1st person	Past
Text B	Making Paddy	Historical text	3rd person	Past
Text C	Chickens	Autobiographical narrative about daily habits	1st person	Present
Text D	Death rituals	Historical text	3rd person	Past
Text E	Rubber Tapping	Autobiographical narrative about childhood/ Procedural	1st person	Past

3.1. Frequencies of Voice constructions

The combined texts contain a total of 148 unambiguously transitive clauses, of which 98 (66%) occur in AV and 50 (34%) appear in UV, suggesting that, overall, AV is more basic at the level of frequency. However, the picture is complicated by the fact that some of the texts use AV more frequently, while others use UV more frequently.

Firstly, as shown in Table 3, AV is used much more frequently in autobiographical narratives (A, C and E) that tend to contain many first person, human, subjects. Secondly, UV is used more frequently in non-autobiographical texts that describe historical events (B, D and E). This suggests that the features of arguments, particularly the subject, may play a role in which voice construction is used.

These observations raise questions over why the frequencies of use of AV and UV constructions differ, and whether this variation can be accounted for by properties of the subject or other arguments. This paper takes these observations as a starting point to investigate the role that argument properties play on which clause type is used.

Table 3: *Frequencies of AV and UV clauses in 5 texts*

	TEXT A	**TEXT B**	**TEXT C**	**TEXT D**	**TEXT E**	**TOTAL**
AV	57 (93%)	10 (42%)	15 (71%)	1 (12%)	15 (44%)	98 (66%)
UV	4 (7%)	14 (58%)	6 (29%)	7 (88%)	19 (56%)	50 (34%)
TOTAL	61	24	21	8	34	148

3.2. Features of Arguments

3.2.1. Animacy, Humanness and Person

Previous research on western Austronesian languages has found that UV occurs slightly more frequently when the Undergoer referent is animate (e.g., in Besemah (McDonnell 2016:210), Sasak (Asikin-Garmager 2017:174) and Totoli (Riesberg et al. 2021:14)). However, each of these studies has concluded that animacy is not statistically significant as a factor determining which voice is used. Similarly, in Belait, there is no clear evidence that animacy has an impact on voice choice.

In the Belait corpus data, as shown in Table 4, the vast majority of transitive clauses involve an animate Actor acting on an inanimate Undergoer (82% of clauses) or animate Actor acting on an animate Undergoer (13% of clauses), with very few clauses where the Actor is inanimate. When the Actor is animate, the animacy or inanimacy of the Undergoer does not seem to have an effect on which voice is used. Table 4 shows that in both configurations, AV is used in 63-65% of cases, while UV is used in 35-37% of cases. These figures closely match the overall frequencies of AV/UV in discourse (AV=66%, UV-34%), suggesting that the animacy of the Undergoer does not influence voice.

Looking at the few clauses with inanimate Actors (n=8, 5% of all clauses), there is a clear preference for AV (7 clauses are AV, while only 1 is UV). An example of an AV clause with inanimate Actor and Undergoer is shown in (4) below. It may be the case that stronger patterns would emerge from a data set that includes more inanimate Actors acting on animate and inanimate Undergoers. However, this type of construction is not common in naturalistic language, and therefore unlikely to play a major role in the overall asymmetry in frequencies of AV-UV as observed in natural language production.

Table 4*: Frequencies of Animate (human and non-human) and Inanimate Actors and Undergoers*

(an = animate, inan = inanimate, A = Actor, U = Undergoerz

	A	**B**	**C**	**D**	**E**	**TOTAL**
an.A > an.U	AV 2 UV 0	AV 1 UV 0	AV 9 UV 5	AV 0 UV 2	AV 0 UV 0	**AV** 12 (63%) **UV** 7 (37%)
an.A >inan.U	AV 50 UV 4	AV 9 UV 14	AV 6 UV 1	AV 1 UV 5	AV 13 UV 18	**AV** 79 (65%) **UV** 42 (35%)
Inan.A >an.U					AV 1 UV 0	**AV** 1 (100%) **UV** 0 (0%)
inan.A > inan.U	AV 5 UV 0				AV 1 UV 1	**AV 6** (86%) **UV 1** (14%)

(4) *shiek* *lesau* *m-anaa* *tijiew* *kira-kira* *limah minit* *mesa*
Water hot AV-cook egg want-want five minutes time
'The hot water (hot spring) can cook an egg in 5 minutes.'

(Belait Corpus: Ceritia Sabah)

Another question to consider is whether humanness has any effect on which voice construction is used. Only one text in the corpus includes both human and non-human animate arguments: The narrator of Text C describes a daily routine for looking after chickens, with 14 clauses that contain human and non-human animate arguments. The figures in Table 5 show that UV is more frequent when the undergoer is Human, and the Actor is non-human (50% AV, 50% UV), compared to clauses when the Actor is human and the Undergoer is non-human (71% AV, 29% UV), suggesting that clause types may be manipulated to allow human arguments to appear as the subject. These figures differ from the observed average frequencies of AV (66%) and UV (34%) shown in Table 3, above. However, the sample size is rather small so no firm conclusions can be drawn. Furthermore, AV and UV are both clearly acceptable in cases where the Undergoer is Human, shown in the AV and UV examples (4a) and (4b) below. Therefore, a preference for human subjects is unlikely to fully explain the asymmetrical frequencies of use.

Table 5: *Frequencies of Human and Non-human Actors and Undergoers*

	Text C
Human > non-Human (animate)	AV 5 (71%) UV 2 (29%)
Non-Human (animate) > Human	AV 3 (50%) UV 3 (50%)
Non-Human (animate) > Non-Human	AV 1 (100%) UV 0

(4a) *semuwia* *m-usoo* *sakai* *yieh*
All AV-chase 1 DET
'They (chickens) all chase me.'

(4b) *kau* *n-abiin* *din* *yieh*
I UV-wait 3.NON-HUMAN DET
'They (chickens) have waited for me.'

(Belait Corpus: Ceritia A'aal)

If animacy and humanness of arguments do not play a major role in which voice is used, we might wonder whether the person features of the arguments are important. However, this does not appear to be the case. Whether the Actor is first person or third person, the overall average frequencies show that AV is used around twice as frequently as UV (Table 6), which is similar to the overall frequencies shown in Table 3. In the sample, UV is used slightly more frequently when the Undergoer is 1st person (37% UV n=3), compared to when the Undergoer is 3rd person (33%, n=47). However, the frequency of 1st person Undergoers is very low overall, and only found in two of the texts, meaning that it is not possible to draw any firm conclusions. In sum, the Person features of arguments do not seem to have a strong influence on which voice construction is used.

***Table 6**: Frequencies of First and Third person Actors and Undergoers (1= 1st person, 3= 3rd person)*

	A	B	C	D	E	TOTAL
1.A > 3.U	AV 32 UV 4		AV 6 UV 3		AV 12 UV 19	**AV** 50 (66%) **UV** 26 (34%_
3.A >1.U			AV 4 UV 3		AV 1	**AV** 5 (63%) **UV** 3 (37%)
3.A >3.U	AV 27 UV 0	AV 10 UV 14	AV 5 UV 0	AV 1 UV 7	AV 2	**AV** 45 (68%) **UV** 21 (32%)

3.2.2. Definiteness

Another argument-related feature that could play a role in which voice construction is used is definiteness of arguments. In Section 2, I stated that subjects tend to be definite in both UV and AV, which was also observed in Clynes' data from the Kiudang dialect (2005). Looking at my corpus data, it is clear that this observation is a tendency, rather than a restriction.

When both arguments are definite,[3] there is a slight preference for AV (n=27, 55%) over UV (n=22, 45%). Interestingly, UV is used more frequently when both arguments are definite compared to the average frequency of UV use overall, suggesting that the definiteness of the Undergoer may play a role.

When one argument is definite and one is indefinite, there is a clear preference for the definite argument to be the subject. So, when the Actor is definite and Undergoer is indefinite, 94% of clauses are AV (n=62). Conversely, when the Undergoer is definite and the Actor is indefinite, 87% of clauses are UV (n=21). Therefore, definiteness is strongly correlated with the subject in Belait.

***Table 7**: Frequencies of definite and indefinite Actors and Undergoers*
(def = definite, indef = indefinite)

	A	B	C	D	E	TOTAL
def -> def	AV 0 UV 3	AV 5 UV 12	AV 11 UV 4		AV 11 UV 3	**AV** 27 (55%) **UV** 22 (45%)
def- >indef	AV 52 UV0	AV 4 UV 2	AV 4 UV 2		AV 2	**AV** 62 (94%) **UV** 4 (6%)
indef- >def	AV 1 UV 2	AV 1 UV 0	AV UV	AV UV 3	AV 1 UV 16	**AV** 3 (13%) **UV** 21 (87%)
Indef > indef	AV 3 UV 0			AV 1 UV 4	AV 1 UV	**AV 5** (55%) **UV 4** (45%)

Interestingly, though, 11% of transitive clauses in the corpus data have indefinite subjects (n=16), showing that there is no syntactic restriction on indefinite subjects in either clause type. Examples of indefinite subjects are shown in AV (5) and UV, with an indefinite Undergoer subject and null/non-specific Actor (6a), and a definite Actor (6b). The acceptability of these examples shows that, while definiteness of the arguments is related to subject-hood and voice-choice, there must be other factors that can override the definite-subject tendency.

(5) *Siniek* *m-ikul* *kujiet* *yieh*
Chinese AV-carry vegetables DET
'Chinese people carry the vegetables'
(Belait corpus: Ceritia Pulot)

[3] For the purposes of this investigation, definiteness includes any NP that is marked with a definite determiner, a pronoun/demonstrative or null argument.

(6a) *Tak* *liked* *yieh* *n-inau* *ubieng,*
on wall DET UV-make hole
'A hole was made on the wall'
(Belait corpus: Ceritia Mati)

(6b) *embai* *n-itien* *kau* *tak* *ngan*
what UV-carry I in hand
'Something/Whatever I was carrying in my hand.'
(Belait corpus: Ceritia A'aal)

3.2.3. Null Arguments

As we have seen in example (6a), arguments can be syntactically omitted, even though they are semantically accessible. Next, we turn to an examination of contexts in which arguments can be omitted from AV and UV clauses. In short, both clause types allow either or both arguments to be omitted, and null arguments occur very frequently in narrative texts (60%, n=89 of all clauses have at least one omitted argument).

When AV clauses have omitted arguments, 58% are Actors, 24% are Undergoers, and 18% are both. When UV clauses have omitted arguments, 52% are Actors, 21% are Undergoers and 26% are both, shown in Table (8). Somewhat surprisingly, Actors and Undergoers are omitted in similar proportions in both AV and UV, with Actors more than twice as likely to be omitted in both voices.

Table 8: *Frequencies of Null Arguments in AV and UV*

		A	B	C	D	E	TOTAL
AV	Null A	8	4	8	1	8	29 (58%)
AV	Null U	8		2		2	12 (24%)
AV	Null A and U	4	4	1			9 18%)
UV	Null A	2	4		6	8	20 (52%)
UV	Null U		4	3		1	8 (21%)
UV	Null A and U		4	3	1	1	10 (26%)

Example (7) shows three AV clauses taken from a narrative text describing how to make a rice paddy field. The first clause has two overtly expressed arguments, the Actor *idieh* 'people', and the Undergoer *padii tugiel* 'paddy hill'. In the following clauses, the Actor referent remains people and is unexpressed (represented as 0 in the examples). In the second clause, a new Undergoer argument is introduced into the discourse and is expressed overtly: *merran* 'forest'. In clause three, the Undergoer argument continues as the same referent 'forest', and both arguments are unexpressed.

(7) *idieh* *u-mau* *padii* *tugiel…* *0* *u-mau* *merran*
person AV- make paddy tugal (dry, hilly land), 0 AV- make forest
ACTOR UNDERGOER A U

tiyieh *ataupun* *0* *n-undrek* *0* *bilia* *ngaa* *mara.*
there or 0 AV-chop.down 0 when TAM dry
A U

'People made hill paddies, they worked on the forest there or chopped it down when it was dry.'
(Belait Corpus: Ceritia Padi)

Similar observations are found in UV clauses, shown in (8), another extract from the same narrative about preparing a rice paddy. (8) illustrates 3 consecutive UV clauses. In Clauses 1 and 2, both the Undergoer and Actor arguments are omitted, and both referents are highly topical in the preceding

discourse and can therefore be accessed by the addressee. In the third clause, the Undergoer, which remains the same referent is unexpressed, while the Actor is expressed as a pronoun, dih 'they/them'.

(8)

	0	*ngaa*	*leppoo*	*mabiey*	*s-i-ndrab*	*0,*	*0*	*t-en-abiah=lah*		*0*
	0	TAM	ready	finish	<UV>burn	0,	0	<UV>set.aside= PTCL		0
	U					A	U			A

0	*k-en-abiang-k-en-abiang*	*dih*	*niek*
0	<UV>CLEAN-REDUP	3.SG.NON-HUMAN	EARLIER

'They had already finished burning and clearing the wood.'

(Belait Corpus: Ceritia Padi)

Overall, there is no clear pattern or preference regarding which argument is unexpressed in which clause type: AV and UV clauses allow either Actor, Undergoer or both to be omitted, and they are omitted in similar frequencies in both clause types.

3.2.3. Summary of Argument Features and Voice

The findings presented in the previous sections are summarized in Table 9. We have seen that AV clauses occur more frequently than UV clauses, Animate Actors are found in both clause types, Actors and Undergoers frequently occur in 1st and 3rd person and Null Actors are very common in both clause types. There may be a tendency for human referents to occur as the subject, meaning that human Actors occur in AV and human Undergoers occur in UV. However, further research is required to confirm this. There is a preference for definite referents to occur as the subject, meaning that definite Actors occur in AV while definite Undergoers occur in UV.

Definiteness is typically associated with topicality (Cooreman 1983; Lambrecht 1994), so we may wonder whether the definiteness preference we have observed in Belait is related to topicalization. In the following section, I aim to tie these findings together with discussion of the status of the information structure category, sentence topic.

Table 9: *Summary of argument properties in Belait transitive clauses*

	AV	UV
Frequency	More frequent	Less frequent
Animacy	Animate Actors	Animate Actors
Humanness	Human Actors (tendency)	Human Undergoers (tendency)
Person	1, 3 person Actors	1, 3 person Undergoers
Definiteness	Definite Actor	Definite Undergoer
Nullness	Null Actors and Undergoers	Null Actors and Undergoers

3.2.4. Sentence Topics

The properties that have been explored in the previous sections tend to be associated with the information structure category of topic, the referent that a sentence is about. Certain types of expression are more suitable as sentence topics than others: in terms of human cognition, topics should be familiar and/or active in the mind of speaker/addressee. At the minimum, topics need to be identifiable by the addressee, meaning that definite, specific referents are typical topics, while brand new referents, wh words, non-specific indefinite referents are typically not acceptable as topics (Lambrecht 1994). Lambrecht (1994) proposes a Topic Acceptability Scale, shown in (9).

(9) active > accessible > unused > brand-new anchored > brand-new unanchored

According to Lambecht's hierarchy, we would expect the most active referent to occur as the topic. This is what we saw in the examples (7) to (8) above, where activated referents were frequently

unexpressed in both clause types, when they continued in the discourse from their initial mention. In fact, there are many cases in the corpus where the subject of a transitive clause is a continuing, given topic, exemplified in (10), where the continuing topic, *kamai* 'we' is the subject in each clause.

(10) Given Topic

Kamai	*lakaau*	*melawiat*	*diew*	*naan*
We	walk	AV- visit	many	places

Kamai	*melawiat*	*naan*	*adien*	*nyieh*	*iring*
We	AV-visit	place	name	it	Iring

'We visited many places. We visited a place called Iring.'

(Belait Corpus: Ceritia Sabah)

Although most clauses in the sample have a subject argument that is also the topic of the clause, there are cases where the subject does not have the features of a typical topic.

For example, in (11), the subject of the AV verb *sukaa* 'like' is the Actor argument *diew buluun* 'many people'. This argument is not part of the common ground and has not previously been introduced in the discourse. Therefore, the referent is brand-new and not acceptable as a topic according to Lambrecht's hierarchy. Rather, based on structural position, it appears that the adjunct prepositional phrase, *tak jung gunung* 'on the mountain' is the given topic of this clause since it appears in the sentence initial position and is activated in the previous discourse.

(11)

tak	*jung*	*gunung*	*yieh,*	*diew*	*buluun*	*sukaa*	*anaak*	*kau*
on	on	mountain	DET	many	person	AV- like	child	my

'On the mountain, many people liked my child.'

(Belait corpus: Ceritia Sabah)

Another challenge to the idea that subjects are obligatory topics is presented by clauses where the non-subject argument appears as a topic. This is shown in example (12). *Seluwaar biet* 'long trousers' appears as a fronted topic, although it is the Undergoer argument of an AV verb, *m-elliey* 'buy' so cannot be the subject of the clause. The referent 'trousers' has been discussed in the preceding discourse and is activated in the minds of speaker and addressee, meaning that it is suitable as a topic according to Lambrcht's hierarchy.

(12)

Seluwaar	*biet*	*ndieh*	*nyieh*	*melliey*
Trouser	long	NEG	3.SG	AV-buy

'They didn't buy trousers.'

(Belait corpus: Ceritia Sabah)

3.3. Measuring Topicality

These examples show that, while there is often a relationship between the subject and sentence topic, this is not always the case. We may also wonder what happens when both referents are acceptable topics. One method that has been used to compare the topicality of two arguments is to calculate their Referential Distance (Givón 1983).

3.3.1. Referential Distance

Referential distance (RD) concerns the continuity of referents by analysing the preceding discourse environment (Riesberg et al. 202:18). The idea is that fewer clauses between a referent and its previous mention shows a shorter RD and equates to a higher degree of topicality. To calculate referential distance, The RDs of the two arguments in a transitive clause are compared to determine whether the RD of the actor argument is longer or shorter than the RD of the undergoer argument (Dryer 1994;

Quick 2005; Hemmings 2017; Asikin-Garmager 2017; Riesberg et al. 2021). A short RD means that the referent is mentioned one to three clauses previously. A long RD means that the referent is not mentioned in the preceding three clauses.

According to Referential Distance, the Belait corpus data shows that Actors are highly topical in AV (91%) and UV (94%), see Table 10. Undergoers are much more topical, with lower RD, in UV clauses (82%), compared to AV clauses (57%). These findings are in line with previous studies on RD across Western Austronesian languages. In general, AV Actors are found to be highly topical with a low average RD, while AV Undergoers are less topical with longer RDs. In UV clauses, UV Actors are also highly topical, while UV Undergoers may be less topical (Riesberg et al. 2021).

This data shows that there is clearly a correlation between topical Undergoers and UV. However, this is a tendency rather than a strong restriction or rule, suggesting that the properties of the subject and non-subject arguments play a role in which voice construction is used but do not fully explain the asymmetries in frequency.

Table 10: *Referential Distance in Belait AV and UV clauses*
(1-3 = short RD, 3+ = long RD)

	AV Actor	**AV Undergoer**	**UV Actor**	**UV Undergoer**
Text A	1-3 96% (55) 3+ 4% (2)	1-3 56% (32) 3+ 44% (25)	1-3 75% (3) 3+ 25% (1)	1-3 50% (2) 3+ 50% (2)
Text B	1-3 90% (9) 3+ 10% (1)	1-3 40% (4) 3+ 60% (6)	1-3 100% (14)	1-3 71% (10) 3+ 29% (4)
Text C	1-3 80% (12) 3+ 20% (3)	1-3 73% (11) 3+ 27% (4)	1-3 100% (6) 3+	1-3 66% (4) 3+ 34% (2)
Text D	1-3 100% (1)	1-3 100% (1)	1-3 100% (7)	1-3 86% (6) 3+ 14% (1)
Text E	1-3 80% (12) 3+ 20% (3)	1-3 53% (8) 3+ 47% (7)	1-3 89% (17) 3+ 11% (2)	1-3 100% (19)
TOTAL	1-3 91% (89) 3+ 9% (9)	1-3 57% (56) 3+ 43% (42)	1-3 94% (47) 3 + 6% (3)	1-3 82% (41) 3+ 18% (9)

3.3. Properties of the event

While topicality of arguments does reveal some tendencies in the use of AV and UV clauses in Belait, it does not seem to tell the whole story, and it seems that other factors are involved. Looking back at Table 3, the texts that contain more UV clauses are texts that describe past, completed events, while those that use more AV clauses describe habitual or non-completed events. Looking more closely at the texts, it seems that UV is associated with perfective or completive aspect, while AV occurs in non-perfective contexts. UV also appears to be obligatorily used in change of state events and resultatives.

To illustrate, in Text C, most of the narrative uses AV, describing habitual actions, as shown in (13a), describing how the narrator feeds the chickens every day. Where UV is used, an aspectual shift is observed: the narrator uses UV to describe events that are completed at the time of narration and not habitual events, as shown in (13b).

(13a) *(kau)* *p-a-kaan* *din* *yieh*
I CAUS-AV-eat 3.NON-HUMAN. DET
'I feed them.'

(13b) *(a'aal yieh)* *p-en-ulon* *k-en-uroong* *kau* *aliem* *paud darii tik*
the chickens <UV>keep <UV>lock I in cage from small
I have kept them locked in a cage since they were small.'

(Belait corpus: Ceritia A'aal)

Similarly, Text E uses many AV clauses to describe (past) habitual actions. When the narrator describes the process of making rubber and changes of state, a clear switch to UV is observed.

(14a) *ubien-ubien* *sikgiem* *kamai* *lau* *m-u-tung* *pulot*
Every-every morning we go <AV> tap rubber
'Every morning we used to go tapping rubber'

(14b) *pulot* *yieh* *k-en-alod ngan* *chukia* *no* *ndieh* *k-i-naan yieh… peneku.*
rubber DET <UV>mix with vinegar REL NEG <UV>eat DET… <UV>freeze
'The rubber was mixed with vinegar that wasn't eaten, frozen…'
(Belait Corpus: Ceritia Pulot)

These examples suggest that UV and AV have different event semantic properties. Therefore, properties such as telicity and boundedness of the event and affectedness of the Undergoer may prove to be more influential than properties of the subject on which voice construction is used.

4 Conclusion

This paper has investigated whether the properties of subject and non-subject arguments have an effect on the asymmetrical frequencies of use of AV and UV clauses in Belait. Evidence shows that subjects tend to have the features of sentence topics (e.g. they are often definite). However, this tendency does not explain the whole picture. Rather, it seems that the properties of the event, such as telicity, aspect and affectedness likely play an important role and will be the focus of further study.

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AN OBSERVATION OF VIETNAMESE NON-CANONICAL OBJECTS AND (PSEUDO) INCORPORATED NOMINALS

Thu Trang HO
Institute of Linguistics, National Chung Cheng University
genny.ho81@gmail.com

Abstract
This paper demonstrates the semantic syntax mismatch between non-canonical objects (NCOs) and (pseudo) incorporated nominals ((P)INs) in Vietnamese (e.g., *ăn* ***sáng*** 'have breakfast', lit. 'eat morning' and *cảm* ***ơn*** 'thank', lit. 'feel favor') Semantically, both NCO and (P)IN constructions are productive and possess institutionalized meanings, and an NCO or a P(IN) may classify events as kind-referring elements. Syntactically, they appear after verbs in surface structure as V-N sequences. However, an NCO differs from a (P)NI in some ways. For instance, a verb combined with an NCO cannot take an additional argument. I build on previous analyses to demonstrate that the cross-linguistics restrictions on (P)INs are also present in Vietnamese. These restrictions include their inability to be modified, take demonstratives, or include proper names. Both constructions are considered types of [V-N] compounds in Vietnamese, yet their differences have not been extensively discussed. In this paper, I explicitly show how they are similar and different in both semantics and syntax. My analysis reveals that NCO constructions in Vietnamese cannot be classified as compound verbs, necessitating a reassessment of the typology of Vietnamese compounds.

Keywords: Vietnamese non-canonical objects, (pseudo) incorporated nominals, compound verbs, semantic features
ISO 693-3 codes: Vietnamese (vie), Mandarin Chinese (zho)

1 Introduction

Vietnamese compound verbs are formed by combining two or more morphemes to express a single verbal meaning. Typically, these compounds follow V-V, or V-N patterns, where verbs pair with other verbs or nouns to convey actions, processes, or states, for instance, *tìm kiếm* 'to search and seek', literally 'search seek', *học bài* 'to study', literally 'study lesson'. Unlike simple verbs, compound verbs often encapsulate more complex meanings, sometimes involving idiomatic or institutionalized interpretations. They are highly productive and versatile, allowing speakers to describe nuanced actions and events, which often blur the lines between syntax and morphology.

Some Vietnamese researchers classify constructions following the [V-N] pattern, such as *ăn đũa* 'to eat with chopsticks', literally 'eat chopstick', *ngủ trưa* 'to take a nap', literally 'sleep noon', *cảm ơn* 'to thank', literally, 'feel favor', or *có tiếng* 'to be famous', literally, 'have reputation' into two types of [V-N] compounds verb (see Hồ Lê 1976, 2018; Nguyễn Phú Phong 1976, 2020; Nguyễn Đình Hoà 1997; Nguyễn Kim Thản 1999, etc.).

Nguyễn Đình Hoà (1997:148) claims that nominals in two structures serve as "a complement to the verb nucleus" (e.g., *đũa* 'chopstick' in *ăn* ***đũa*** 'to eat with chopsticks') and as "the object of the head verb" (e.g., *ơn* 'favor' in *cám* ***ơn*** 'thank'.) However, he did not give a clear distinction between them, nor did he explain what he meant by "the verb nucleus". Is it a verb stem or a supplementary part for a verb phrase?[1] As we know, a thematic object is assigned by the verb, whereas the complement of

[1] I wish to thank an audience member at SEALS 33 for his comments. To him, Nguyễn Đình Hoà (1997) means that those object-like elements are "supplements", but I think he means complements. I argue that NCOs can stay in the object position when the verb is unergative (Ho 2021). In other words, NCOs are complements of unergative verbs.

a verb is a phrase coming after the verb and completes the meaning of the subject or the object in the sentence.

In Ho's (2021) analysis, the object-like nominals in the former structure are non-canonical objects (NCOs) in Vietnamese. This comparative study between Vietnamese and Chinese NCOs highlights their similarities in argument structure. In particular, if a verb is used in an unergative construction, it can take an NCO. For instance, the verb *viết* 'write' in (1a) is transitive, followed by its direct object *thư* 'a letter'. In contrast, it is intransitive in (1b), modified by the adverbial phrase *rất nhanh* 'very quickly'. Therefore, it can take the NCO *bút mực* 'an ink pen' in (1c) as its complement.

(1) a. *Trang đang viết thư.*
Trang DUR write letter
'Trang is writing a letter.'

b. *Trang thường viết rất nhanh.*
Trang often write very quick
'Trang often writes very quickly.'

c. *Trang viết* ***bút mực.***
Trang write **pen ink**
'Trang writes with an ink pen.'

Based on a semantic approach, Nguyễn Văn Hiệp (2012) concurs with Phan's (1983) explanation regarding the different meanings of the object *bàn* 'a table' in (2), attributing these variations to **semantic incompatibility**. The interpretation of such sentences is intuitive for native Vietnamese speakers. In (2a), the postverbal element *bàn* 'a table' functions as a locative role as it does not represent consumable food for humans. In contrast, the object in (2b) refers to the worm's food.

(2) a. *Tôi ăn bàn.*
1.SG eat table
'I eat on a table.'

b. *Con mọt ăn bàn.*
CL worm eat table
'The worm eats the tables.'

Hồ Lê (1976; 2018:448) outlines that object-like elements (i.e., NCOs) may function as Locative, Temporal, or Instrumental complements. He refers to these elements as "*bổ ngữ điều kiện*" ('conditional complements'). A semantic generalization exists between the verb and the noun within these compounds, facilitating comprehension of their structure – he states. However, he does not specify the conditions these object-like elements fulfill, nor clarify the nature of this semantic generalization[2].

Regarding the semantic properties of NCOs in Vietnamese, I have proposed that they function similarly to classifying modifiers, akin to classificatory adjectives (Ho 2023). Vietnamese NCOs categorize events as kind-referring elements. In (1c), the NCO *bút mực* specifies a particular kind of writing event – writing with an ink pen. Another variant might be *viết* ***bút lông*** 'to write with a brush pen', literally 'write pen brush'. Notably, the postverbal nominal *bút lông* 'a brush pen' in this example also serves as an NCO.

Although compound structures have garnered significant attention in linguistic research over the years (see Nguyễn Tài Cẩn 1975; Hồ Lê 1976, 2018; Đỗ Hữu Châu 1981; Hoàng Văn Hành 1991, 2008;

[2] In Ho's (2023) research, I point out some restrictions on Vietnamese NCOs, such as incomparability or an overt pronoun that behaves as an anaphoric element. However, due to the length limitation, I will not repeat them here.

Nguyễn Văn Khang 2008, among others), the focus has largely centered on two key issues: the relation among compounds, words formed by reduplications, phrases, and idioms, and the relation between compounds and free elements in a speech unit (Nguyễn Văn Khang 2008:142). While some studies have addressed the syntactic position and semantic properties of NCO constructions, they have largely overlooked other structures, such as *cảm ơn* ('to thank', lit. 'feel favor'). The divergence between NCOs and their analogous structures remains underexplored in Vietnamese linguistic literature.

The current observation is informed by two pivotal studies: Barrie and Li's (2012) exploration of the similar properties between Northern Iroquoian noun incorporations (NI) and Mandarin Chinese NCOs, and Zhang's (2018, subsection 3.2, 16–18) investigation into Mandarin Chinese NCOs, which points out the parallels between these object-like elements and (P)INs. Drawing on their analyses, I examine the similarities and distinctions between Vietnamese NCOs and (P)INs.[3]

Barrie and Li (2012) suppose that Northern Iroquoian NI and Chinese NCOs share at least two properties cross-linguistically: institutionalization and their constructions are not fully productive. Comitatives, Benefactives, and Recipients cannot behave as NCOs or (P)INs.

First, we consider the institutionalized expressions in NI.[4]

(3) a. Onondaga (Barrie & Li 2012)
waˀ-kǫ- ***yaˀt- ahtǫ-*** *ˀt-aˀę*
FACT- I:you **-body-disappear** -CAUS-PUNC
'I lost you (e.g. in a crowd).

b. *ha-at-* ***hwist-a-nu̱hn-*** *aˀ*
3.SG.M.AG-SRFL **-money-**JOIN-**guard-** STAT
'He is a treasurer.'

c. Mohawk (Gerds 1998:86)
te-ha- ***nuhwa-re-wáyat*** *:ye*
DU- MA **-brain-** his-**lose** - STAT
'He is crazy.'

In some instances, the meaning of the incorporated structure may drift from a simple compositional one, as illustrated in (3c). In other words, they are idiomatic (Gerds 1998).

Chinese cultural convention is to eat with chopsticks, not forks. Thus, a native Chinese speaker will not use the expression in (4b) to express eating with a fork (Barrie & Li, 2012). Chinese NCOs possess conventionalized meanings.

[3] Noun incorporation (NI) is a construction in which a nominal expression appears inside the verbal complex. The differentiation between noun incorporation (NI) and pseudo-noun incorporation (PNI) primarily revolves around morphological aspects. In NI, the incorporated nominal is tightly integrated with the verb and generally exhibits minimal nominal morphology (Sadock 1980; Mithun 1984, 1986; Baker 1988, 1996; Gerdts 1998; Massam 2009). Conversely, PNI provides greater syntactic flexibility, allowing for the incorporation of more complex nominals without requiring strict adjacency (cf. Massam 2001, 2009). Recent research indicates that the complexity of the incorporated nominal does not serve as a conclusive factor in distinguishing PNI, as some languages, such as English permit determiner phrase (DP) incorporation (cf. Carlson et al. 2006; Anguilar-Guevara and Zwarts 2010; Schwarz 2014). This paper will use the term "(pseudo) incorporated nominal" to avoid ambiguity to encompass both incorporated nominals in NI and PNI.

[4] In examples of polysynthetic languages, segmentable morphemes are separated by hyphens in the example and the gloss. The following non-obvious abbreviations are used. AG = agent (S in Baker); ASP = aspect; FACT = factual; JOIN = joiner vowel (an epenthetic vowel in NI constructions in Iroquoian languages); MA = masculine; NE = noun element; PAT = patient (O in Baker); PUNC = punctual; SRFL = single rooted free lexeme; SREFL = single rooted external lexical free; STAT = stative; TNS = tense; 3sS = third-person singular subject agreement.

(4) a. 你 吃 這 雙 筷子 吧!
nǐ chī zhè shuāng kuàizǐ bā
you eat this CL chopstick particle
'You eat with this pair of chopsticks!'

b.*你 吃 這 把 叉子 吧!
nǐ chī zhè bǎ chāzǐ bā
you eat this CL fork particle
Intended: 'You eat with this fork!'

Regarding productivity in the construction, in some languages, nominals denoting instruments, paths, or locatives may be incorporated, as illustrated by the Onondaga examples in (5).

(5) a. Onondaga (Woodbury 2003)
hon-at- ***hah-*** *idakhe* *-ʔ* [Path]
3.PL.M.NOM-SREFL **-path-**run- PUNC
'They are walking on a path'

b. *waʔ-hak* *-ʔ**nhya-** a- yhęd-* *daʔ* [Instrument]
FACT- 3.SN.M.AG:1.SG.PAT **-stick-** JOIN -hit -PUNC
'He hit me with a stick.'

The path-denoting element *hah-* 'path' is incorporated into the verb *idakhe-* '*run'* in (5a). The instrument-denoting element *ʔnhya-* 'stick' does, too in (5b). In the examples of Chukchi NI in (6a), the location-denoting *ralko* 'tent' is incorporated into the verb *waŋerkən* 'sew', or Nahuatl example in (6b) the instrument-denoting *kočillo* 'knife' is incorporated into the verb *teteʔki* 'cut'.

(6) a. Chukchi (Spencer 1995:456, ex. (61))
tə ***-ralko***=*waŋerkən* [Location]
1.SG- **tent**=sew
'I am sewing in the tent.'

b. Hwauhtla Nahuatl (Merlan 1976:185, ex. (10))
Yaʔki- ***kočillo-*** *tete ʔ ki* *panic* [Instrument]
3.SG.3.SG.it- **knife** -cut bread
'He cut the bread with the knife.'

Zhang (2018) shows that Chinese NCOs can decode Location, Manner, Temporal, Purpose, and so on, rather than Theme/Patient, supporting the claim of NCOs' productive properties. An NCO denotes a location as 餐廳 *cān tīng* 'a restaurant' or an instrument 毛筆 *máo bǐ* 'a brush pen' is shown in (7a) and (7b) respectively[5].

[5] Readers can get more examples of Mandarin Chinese NCOs in the Introduction section of Zhang's (2018) paper

(7) a. 吃 **餐廳** [Location]
chī **cān tīng**
eat restaurant
'to eat in a restaurant'

b. 寫 **毛筆** [Instrument]
xiě **máo bǐ**
write brush-pen
'to write with a brush pen

However, Barrie & Li (2012) argue that neither incorporated nominals nor Chinese NCOs occur with semantic roles such as Comitatives, Benefactives, or Recipients. They take the benefactive role as in examples (8b) for Onondaga NIs and (9b) for Chinese NCOs.

(8) a. Onondaga (Barrie & Li 2012)
ę -khe- ***wíhsa**:th-aR-s-Ø* *neˀMeri*
FUT-1.SG:3FEM.INDF **-butter-**APPL-BEN-PUNC NE Mary
'I will butter it for Mary.'

b.**ę -khe-* ***atci**-hrR-aR-s-Ø* *neˀ o-wihs-aˀ*
FUT-1.SG:3FEM.INDF **-friend-**NZLR--BEN-PUNC NE butter
Intended: 'I will butter it for my friend.'

(9) a. 我 為 旅客 看 行李
wǒ wèi lǚ kè kàn xíng lǐ
I for traveler look luggage
'I watch luggage for travelers.'

b.*我 看 旅客
wǒ kàn lǚ kè
I look traveler
Intended: 'I watch (luggage) for travelers.'

In addition to the previously mentioned properties, Zhang posits that Chinese NCOs and (P)INs serve to classify events. The Kusaiean example in (10a) illustrated this: the free-standing noun phrase *mitmita sac* ('the knife') complements the verb, as indicated by the determiner *sac*. In (10b), when the incorporated object *mitmit* 'knife' merges into the verb, it functions as a stripped noun, representing a classifying event. Specifically, (10b) denotes a specialized event, namely, knife-sharpening.

(10) a. Kusaiean (Gerdts 1998:94)
Sah el twem upac ***mitmita** sac* [non (P)IN]
Sah he sharpen diligently **knife** the
'Sah is sharpening the knife diligently.'

b. *Sah el twetwe* ***mitmi** upac*. [(P)IN]
Sah he sharpen knife diligently
'Sah is diligently knife-sharpening

Woodbury (1975:13) explains that in (11a), *neˀ* precedes the noun phrase that denotes its reference, and the marked noun phrase *oyéˀkwaˀ* 'the tobacco' specifies the set of references including sets consisting

of a single element. In contrast, the incorporated noun *yéʔkwa-* 'tobacco' in (11b), is interpreted as *a sort*, or *a kind* because it never refers to a delimited set of references.

(11) a. *waʔhahninúʔ* *neʔ* *oyéʔkwaʔ* [non (P)IN]
TNS-he/it-buy-ASP ART it-tobacco-NM
'He bought the tobacco.'

b. *waʔha* ***yéʔkwa-*** *hní:nuʔ* [(P)IN]
TNS-he/it- **tobacco-** buy-ASP
'He bought (a kind of) tobacco.'

Mandarin Chinese NCOs such as 大刀 *dà dào* 'a big knife' in (12a), represent a specific sub-type of an event, namely, cutting with a knife (i.e. 切 *qiē* 'cut.with.knife'). In (12), the cutting event may involve either a large or small knife. Consequently, a neutral nominal 刀子 *dāo zǐ* 'a knife' is not permissible, as illustrated in (12b). Instead, it must be expressed by a prepositional phrase to indicate the instrument explicitly (12c).

(12) a. 切 大 刀
qiē dà dào
cut.with.knife big knife
'to cut with a big knife'

b.*切 刀子
qiē dāo zǐ
cut.with.knife knife

c. 用 刀子 切
yòng dāo zǐ qiē
use knife cut.with.knife
'to cut with a knife'

Based on the analysis above, we can draw an interim conclusion: NCOs share key semantic features with (P)INs. Specifically, these constructions (i) exhibit institutionalized meaning, (ii) lack full productivity, as comitatives, benefactives, and recipients cannot be incorporated or appear as NCOs, and (iii) may function to classify events.

Further constraints, as noted by Fabb (1988) and Dayal (2015), indicate that proper names and kinship terms cannot be incorporated in Pawnee and Hindi, respectively. Zhang (2018) highlights distinctions between Chinese NCOs and (P)INs, observing that an NCO (i) can take demonstratives, (ii) allows possessors, and (iii) may even include proper names, whereas a (P)IN lacks these features.

(13) a. 寫 那 支 毛 筆 [an NCO with DEM]
xiě nà zhī máo bǐ
write that CL brush pen
'to write with that brush pen'

b. 他 30 歲 了 還 在 吃 他 父母 [an NCO with a possessor]
tā 30 suì le hái zài chī tā fù mǔ
he 30 age PRT still PROG eat he parent
'He is 30 years old but still depending on his parents.'

c. 李奇 在 準備 游 東京 [an NCO = a proper name]
lǐ qí zài zhǔn bèi yóu dōng jīng
Liqi PROG prepare travel Tokyo
'Liqi is preparing to travel to Tokyo.'

Examples of (P)INs are drawn from Gerdts (1998:94) and cited in (14a), Chung & Ladusaw (2004:88) (see (14b)), and Baker (2009:153) (see (14c)).

(14) a. *Sah el twetwe mitmi (*sac) upac.* [an (P)IN with DEM]
Sah he sharpen knife the diligently
'Sah is diligently knife-sharpening.'

b.**Gäi-[lepblo-mmu] yu.* [an (P)IN with a possessor]
AGR.have-book-AGR I
Intended: 'I have your book.'

c. *Pedro ngilla- (*küme) -pulku-pe-y.* [an (P)IN with a modifier]
Pedro buy- good- wine-PASS-INDF.3sS
'Pedro bought (*good) wine.'

This paper does not aim to introduce (pseudo) noun incorporation or establish criteria to differentiate Vietnamese NCOs from (P)INs. Instead, it illustrates their parallelism, as examined by Barrie and Li (2012) and Zhang (2018). Both constructions share some semantic traits, including (i) productivity, (ii) idiomaticity, and (iii) the capacity for kind-classifying elements. Additionally, both follow a post-verbal [V-N] structure. However, while [V-NCO] predicates are unergative, [V-(P)IN] predicates are mainly transitive.

Furthermore, this paper examines potential differences between Vietnamese NCOs and (P)INs by employing Zhang's (2018) diagnostic framework, ultimately demonstrating that NCO constructions should not be classified as compounds due to these distinctions. This study addresses the following research question: Do Vietnamese NCOs syntactically and semantically parallel (P)INs?

The rest of the paper is organized as follows: Section 2 provides an overview of Vietnamese NCOs and (P)INs, highlighting shared semantic properties. Section 3 explores whether meaningful differences exist between NCOs and (P)INs in Vietnamese, drawing on the analyses of Barrie and Li (2012, 2015) and Zhang (2018). Section 4 concludes the study.

2 My observation

In this section, I examine Vietnamese NCOs and (P)INs to explore potential syntactic and semantic similarities. The analysis focuses on their surface syntactic structures and predicates, without delving deeply into their argument structure. I also apply shared semantic features identified by Barrie & Li (2012) and Zhang (2018), specifically: (i) their constructions possess institutionalized meanings, (ii) the nominal can take various semantic roles such as Locative, Instrument, Manner, or Temporal rather than Benefactive, Comitative or Recipient[6], and (iii) they denote a subtype of event.

2.1 The syntactic position of Vietnamese NCOs and (P)INs

In the surface structure, the verb, which takes either an NCO (type (a) examples) or a (P) IN (type (b) example), can follow aspect markers such as perfective *đã* (15), durative *đang* (16), or future *sẽ* (17). Some examples of NCOs (i.e. type (a) examples) are provided by Ho (2021).

[6] Barrie and Li (2012) claim that a Benefactive object cannot be an NCO. However, Zhang (2018:2, ex. 9) provides a counterexample to this claim.

(15) a. *Nam đã đá **nửa-hiệp-đầu** rồi.*
Nam PERF kick **half session head** already
'Nam has already played in the first half session of the football match.'

b. *Nam đã trả **lời** (cho) Hoa rồi.*
Nam PERF give.back **word** give Hoa already
'Nam has already answered Hoa.'

(16) a. *Lan đang ăn **KFC*** [7]
Lan DUR eat **KFC**
'Lan is eating at KFC.'

b. *Đội tuyển Hàn Quốc đang dẫn **đầu** bảng A.*
Team Korea DUR lead **head** list A
'The Korean team is leading the top in the A list.'

(17) a. *Nam có thể sẽ ăn **cái bát lớn đó**.*
Nam maybe FUT eat CL bowl big that
'Nam maybe will eat with that big bowl.'

b. *Tiết mục của Nam sẽ mở **đầu** chương trình đêm nay.*
perfomance of Nam FUT open head program tonight
'Nam's performance will open the show tonight.'

Examples (15) to (17) show that both NCOs (type (a) examples) and (P)INs (type (b) examples) are postverbal. The surface structure of a combination of verbs taking an NCO or a (P)IN is a [V-N] form. However, we can see the difference in the predicates.

It is seen in (15b), (16b), and (17b) that the verb in [V- (P)IN] structure is transitive. The incorporated objects are seen as (a part of) an argument of the verb (Zhang n.d). An additional argument can exist after the combination of [V- (P) IN] in all three (b) examples. For example, the direct object *Hoa* (15b) follows the verb *trả lời* 'answer', while the prepositional *cho* 'for' is optional. Similarly, *bảng A* 'list A', *chương trình* 'program' present after the verbs *dẫn dầu* 'to lead' in (16b), *mở đầu* ' to start (program)' in (17b) respectively. I provide more examples below.

The instrument-denoting element *máy* 'machine' in (18a) is incorporated into the verb *đánh* 'to hit,' and their whole components decode a transitive predicate with the presence of the object complement *văn bản* 'document.' In (18b), the nominal *tay* 'hand' is the possessee part of the internal argument (i.e., *huấn luyện viên* 'coach'). The verb *bắt tay* 'shake hands' selects the postverbal element as its canonical object.

(18) a. *Nam đang đánh **máy** văn bản.*
Nam DUR hit **machine** document
'Nam is typing a document.'

b. *Messi đã từ-chối bắt **tay** huấn-luyện-viên.*
Messi PERF refuse catch **hand** coach
'Messi refused to shake hands with his coach.'

[7] Ho (2021:30) gives inappropriate examples of Vietnamese NCOs, indicating that an NCO can be a proper name. The verb *du lịch* 'to travel', literally 'wander.experience' is a V-V compound verb. Its original Sino-Vietnamese stem is 遊歷 *yóu lì* 'to travel'.

Moreover, in Vietnamese, the incorporated object can take an external nominal, as shown in (19a), or a clause as its complement, as shown in (19b).

(19) a. *Nam sẽ đặt* ***tên*** *Quốc cho đứa con trai thứ hai.*
Nam FUT put **name** Quoc give CL son second
'Nam will name his second son Quoc.'

b. *Hắn đã xâu* ***chuỗi*** *các sự việc diễn ra hôm qua ở nhà hàng.*
3.S.M PERF string bead PL things happen yesterday at restaurant
'He strung together events that happened yesterday at the restaurant .'

In (19a), the incorporated nominal *tên* 'name' precedes the proper name *Quốc*–an external nominal. In (19b), the manner-denoting element *chuỗi* 'bead' precedes a clause–events that happened yesterday at the restaurant.

As seen in (15a), (16a), and (17a) a verb taking a non-canonical object cannot take the further argument. An NCO cannot co-occur with a thematic object, as shown in (20c) (Nguyễn Văn Phổ 2018:98). The NCO *đũa* 'chopstick' must appear in a prepositional phrase *bằng đũa* 'by/with chopsticks' if the internal argument *cơm* 'cooked rice' of the verb *ăn* 'eat' is present in the sentence, as in (20b).

(20) a. *Nam ăn* ***đũa.***
Nam eat **chopstick**
'Nam eats with chopsticks.'

b. *Nam ăn cơm bằng đũa.*
Nam eat cooked-rice by chopstick
'Nam eats cooked rice with chopsticks.'

c.**Nam ăn đũa cơm.*
Nam eat chopsticks cooked rice

To conclude, verbs taking an NCO or a (P)IN form a [V- N] construction in the surface structure. However, in (P)NI constructions, verbs are mainly transitive. In NCO constructions, verbs are either transitive or intransitive (see more examples in Zhang 2018 and Ho 2021). The incorporated nominal may be the possessee part or the head noun of the internal argument of the verb, or it may take an external argument as its complement. The non-canonical object is base-generated by a complement of an unergative verb, as Zhang and Ho suppose.

2.2 The semantic functions of NCOs and (P)INs

This section illustrates some semantic characteristics shared by NCOs and (P)INs in Vietnamese. It starts with their construction under productivity and conventionalization and ends with their semantic roles as event kind-classifying elements.[8]

2.2.1 NCOs and (P)NIs have various forms

Corresponding to the diverse forms of Chinese NCOs in Zhang (2018), I copy examples of Vietnamese NCOs cited in Ho (2021, 2022). Type (a) examples are transitive verbs and type (b) are intransitive verbs. The semantic roles of each pair are noted in the last column.

[8] I borrow this terminology from Zhang (2018).

(21) a. *viết* ***bút mực***
write pen ink
‘ to write with an ink pen’

b. *ngủ* ***lều*** Instrument
sleep tent
‘sleep in a tent’

(22) a. *mặc* ***thời trang***
wear time.clothes
‘wear clothes stylishly’

b. *nhảy* ***chachacha*** Manner
jump Cha-Cha
‘dance Cha Cha’

(23) a. *ăn* ***nhà hàng***
eat restaurant
‘eat in a restaurant’

b. *nằm* ***đất*** Location
lie ground
‘lie on the floor’

(24) a. *dạy* ***tối***
teach night
‘teach in the evening’

b. *nghỉ* ***thứ Năm*** Temporal
rest Thursday
‘rest on Thursdays’

(25) a. *ăn* ***tiệc***
eat party
‘join/have a party’

b. *khóc* ***số phận*** Reason
cry destiny
‘cried for one’s destiny’

(26) a. *bán* ***từ thiện***
sell charity
‘sell something for charity’

b. *chạy* ***trường*** Purpose
run school
‘find ways to enter the ideal school’

(27) a. *ăn* ***tiền***
eat money
‘gain money by gambling’

b. *chơi* ***hụi*** Financial resources
play tontine
‘join in a tontine’

(28) a. *cắt* ***nam*** Benefactives
cut male
‘haircuts for men’

Constructions in which nominals incorporate into verbs, yielding a new form in Vietnamese, are also rather productive. These (P)INs can express instrument, purpose, manner, and so on, as in (29).

(29)

	Vietnamese	gloss	English	Roles
a.	*nổ* ***mìn***	explode bomb	‘to bomb’	Instrument
b.	*dẫn* ***đầu***	lead head	‘to lead’	Manner
c.	*bắt* ***nguồn***	catch source	‘to originate’	Location
d.	*bỏ* ***tù***	put jail	‘to put someone in jail’	Goal

Indeed, a variety of semantic roles of both NCOs and (P)INs are attested in Vietnamese. Barrie and Li (2012, 2015) agree that NCO constructions and NI are not fully productive because neither an NCO nor a (P) IN is found with benefactive, comitative, or recipient roles. My data in Vietnamese, especially (P)INs, does not demonstrate this point. I believe these issues may be answered through further research. Here, I focus only on the various forms of those nominals.[9]

[9] Incorporation includes thematic and non-thematic objects. However, NCOs cannot be thematic objects or take on a patient role. Indeed, this point is also a difference between NCOs and (P)INs. This article pays attention to the various semantic roles that (P)INs and NCOs can have.

2.2.2 Their constructions have idiomatic expressions

As an event kind-classifying element, an NCO must name a property of an institutionalized subclass of an activity (Barrie & Li, 2015, cited in (Zhang, 2018), (Ho, 2023)). We see examples in (30).

(30) a. *ăn* ***đũa***, *ăn* ***muỗng*** *hay* *ăn* ***nĩa***
eat chopsticks eat spoon or eat fork
'to eat with chopsticks, with a spoon or with a fork'

b. *ăn* ***nhà-hàng*** *hay* *ăn* ***căng tin***
eat restaurant or eat canteen
'to eat at a restaurant or eat at the canteen'

c.**ăn* *trường*
eat school
Intended: 'to eat at school'

Vietnamese people commonly use chopsticks, spoons, or forks when having a meal. Thus, Vietnamese speakers accept the expression in (30a). Likewise, they may say *ăn nhà hàng* 'eat at/in a restaurant' or *ăn căng tin* 'eat at/in the canteen' (30b) but do not say *ăn trường* ('lit. eat school'), as in (30c) to express eating at school. The location-denoting element *trường* 'school' must be followed by a preposition *ở* 'in/at' instead. An NCO construction gets a conventionalized reading.

Besides studies of Hồ Lê (1976, 2018) on a typology of compounds, Nguyễn Văn Khang (2008) discusses the general rule of compounding in Vietnamese: Two elements can combine and produce a new lexical compound, and then the compound must bear the logic and habitual language used by native speakers. In the examples of (31), whether the nominals are part of the same group, Vietnamese speakers do not use the expressions in (31a') and (31b') but use (31a) and (31b) instead.

(31) a. *học* ***gạo***
learn rice
'to bone up' or 'to mug something up'

b.**học* *nếp*
earn sticky rice

(32) a. *dẫn* ***đầu***
lead head
'to lead' or 'to come foremost'

b. **dẫn* *tay*
lead hand

Nguyễn Đình Hoà (1997:149) gives another example, the expression *chống gậy* 'to walk with a stick', literally 'lean.on stick'. In the context of a funeral, this idiomatic phrase is interpreted as a man, typically walking backward toward one's father's hearse, leaning upon a cane.

2.2.3 They classify events

In Zhang's (2018) analysis, an NCO behaves as an event kind-classifying element. I have similarly provided evidence indicating that an NCO in Vietnamese does (Ho 2023). They get properties as a classifying modifier, like a classificatory adjective. As Zhang says, they specify the kind of entity or event encoded by the modified noun. For example, the adjective *musical* in the phrase *musical instrument* is classificatory. It classifies a type of instrument that differs from others, such as *surgical instruments*. In the phrase 寫毛筆 *xiě máo bǐ* 'write with a brush pen', literally 'write brush pen,' the Chinese NCO 毛筆 *máo bǐ* 'a brush pen' denotes a kind of an event of writing which uses a brush pen, that differs from different types such as 寫鋼筆 *xiě gang bǐ* 'write with a pen', literally 'write steel pen'.

Returning to the examples in (30a), three Vietnamese NCOs denote different instruments used during a meal. Another example is *ngủ* ***lều*** 'sleep on the tent', literally 'sleep tent'. It may state a

different type of event expressed by the verb *ngủ* 'sleep'. Sleeping may include sleeping on a bed, *ngủ* ***giường*** (lit. 'sleep bed'), or sleeping in a hammock, *ngủ* ***võng*** (lit. 'sleep hammock').

Vietnamese (P)INs can name a kind of event expressed by the verb. In (33a), the bare noun *phiếu* 'ticket' means a protest vote, and the phrase *bỏ phiếu* refers to the voting event (Hồ Lê 2018:451-452). The (P)IN does not refer to a specific entity. Therefore, the nominal phrase *phiếu trắng* 'lit. ticket white' does not express the ticket with white color in (33b). Instead, it refers to another type of voting event, specifically leaving a blank. In (33c), the (P)IN construction refers to another type: having a secret ballot.

(33) a. *bỏ* ***phiếu***
put/leave **ticket**
'to vote'

b. *bỏ* *phiếu* *trắng*
put/leave ticket white
'to leave a blank vote'

c. *bỏ* *phiếu* *kín*
put/leave ticket secret
'to have a secret ballot'

From the above observation, an NCO and a (P)IN in Vietnamese can classify events. They may name a kind of event expressed in the verb.

The temporary conclusion drawn from the above illustration is that Vietnamese NCOs share some semantic traits with the (P)INs. Both have a variety of semantic roles, get conventionalized meanings, and can classify events.

The syntactic position (i.e. postverbal) and semantic properties shared by NCOs and (P)INs account for their mismatch in linguistic analyses of Vietnamese. Verbs that combine with either an NCO (e.g., *ăn* ***đũa*** 'eat with chopsticks') or a (P)IN (e.g., *nổ* ***mìn*** 'explode') form a [V-N] structure, and both constructions exhibit certain semantic similarities. Due to their shared [V-N] form and overlapping semantic traits, two constructions are grouped together as two types of verbal compounds. However, this classification lacks compelling evidence to fully account for their differences. As discussed earlier, the verb's transitivity in these two constructions is distinct: one typically functions as unergative, while the other is most often transitive. Additionally, their predicate structure differs. When a canonical argument co-occurs with an additional argument, the additional complement must be introduced by a preposition, forming a prepositional phrase rather than directly standing behind the verb to form a [V-NCO] construction. By contrast, a (P)IN is integrated into the verb, forming a [V- (P) IN] construction, and it may or may not require additional arguments to complete the sentence's meaning (see examples in (15b), (16b) and (17b)).

In the following section, I will provide further analysis to support my argument that NCO constructions should not be classified as compounds.

3 They differ in some ways

This section shows restrictions on (P)INs to differentiate them from NCOs as claimed by Barrie and Li (2012, 2015) and Zhang (2018). According to their analysis, a (P)IN does not allow (i) adjectival modification, (ii) demonstrative, or (iii) include a proper name, while an NCO can. I will employ these constraints in Vietnamese data to testify if Vietnamese NCOs obey them.

Following Zhang (2018), I assume that Vietnamese NCOs may take modifiers, have possessors, and become proper names (Ho 2021). Now, we can see if Vietnamese (P)INs also have those features in examples (34) to (37).

(34) a. *ăn bát lớn*
eat bowl big
'to eat with a big bowl'

b. *nổ mìn* (**lớn*)[10]
explode bomb big
Intended: 'to explode with a big bomb'

(35) a. *ăn bát đó*
eat bowl that
'to eat with that bowl'

b. *nổ mìn* (**đó*)
explode bomb that
Intended: 'to explode with that bomb'

(36) a. *ăn nhà hàng lớn*
eat restaurant big
'to eat at/in a big restaurant'

b. *bắt nguồn* (**lớn*)
catch source big
Intended: 'to originate from a big source'

(37) a. *ăn nhà hàng đó*
eat restaurant that
'to eat at/in that restaurant'

b. *bắt nguồn* (**đó*)
catch source that
Intended: 'to originate from that source'

Those examples (b) show some properties of (P)INs in Vietnamese data. As Dayal (2003) says, the object nominal neither takes a determiner nor an adjective modifier in (P)IN constructions. The adjective *lớn* 'big' or demonstrative *đó* 'that' may modify its head noun *bát* 'a bowl' in the NCO construction (34a) and (35a), respectively. Nevertheless, two elements cannot be accepted in the (P)IN construction, as shown in (34b) and (35b). This is the same restriction in the example (33). Neither the adjective *trắng* 'white' nor *kín* 'secret' modify the thematic object *phiếu* 'ticket'. They denote two kinds of event voting (i.e., *bỏ phiếu* 'vote', lit. 'leave ticket').

In (36a) and (37a) NCOs refer to a location. The adjective *lớn* 'big' and the demonstrative *đó* 'that' can be accompanied by the head noun *nhà hàng* 'restaurant'. In contrast, those elements are not allowed in (36b) and (37b).

Lastly, an NCO can be a proper name in Vietnamese (38), while a (P)IN cannot (39).

(38) a. *ngủ Park Hyatt*
sleep Park Hyatt
'to sleep in Park Hyatt hotel'

b. *dạo Nguyễn Huệ*
stroll Nguyen Hue
'to stroll the Nguyen Hue walking street'

(39) *đặt* *(*tên*) *Nam cho con-gái*
place name Nam for daughter
'to give one's daughter a name as Nam'

As Zhang (2018) posits, proper names express a property rather than an individual. The name *Park Hyatt* stands for a luxury hotel, an elegant and wellness stay in Ho Chi Minh City in Vietnam. The walking street *Nguyen Hue* is famous for its 60-meter vibrant pedestrian promenade in the city center of Ho Chi Minh City. The examples illustrate specific kinds of sleeping events (38a) and walking events (38b).

In Vietnamese culture, the name *Nam* is often given to a boy rather than a girl. In (39), the nominal argument *tên* 'name' becomes a part of the verb; the phrase *đặt tên* assigns the proper name *Nam* as its argument. Put differently, *Nam* is the internal argument of the verbal complex *đặt tên* 'to name'. The nominal *tên* 'a name' inside the [V-(P)IN] construction cannot be omitted. Otherwise, the phrase would be incorrect.

Giving details of restrictions on (P) IN constructions is beyond the scope of this paper. However, the cross-linguistic restrictions on (P)INs are traced in Vietnamese, as shown in previous sections. Put

[10] I thank some audience members at SEALS 33 who suggested I use the corresponding example here. If an NCO in (34) and (35) is an instrument, a (P)IN is, too. Thus, I changed *cảm ơn* 'to thank'(lit. feel favor) in my presentation file to *nổ mìn* 'to bomb' (lit. explode bomb) and provided more instances.

differently, Vietnamese has the phenomenon of so-called '*noun incorporation*' (cf. Mithun, 1981; Sapir, 1911; Sadock, 1986; Rosen, 1989; Gerdts, 1998; Johns, 2007; 2017; Massam, 2009; among others), and it is different from NCOs, unlike what some Vietnamese researchers have claimed in past literature.

4 Conclusion

In this article, I have reviewed Vietnamese non-canonical objects. I have examined properties shared by Vietnamese NCOs and (P)INs. This study follows the work of Barrie & Li (2012) and Zhang (2018) about Chinese NCOs and (P)INs in some polylanguages. Both Vietnamese NCOs and (P)INs can have conventionalized meanings; take various semantic roles such as Instrument, Locative, Manner, Temporal, and so on; and classify events. Their construction shows the same structure as a [V-N] phrase. This observation explains their mismatch in Vietnamese-language literature on this topic. In addition, their differences have been discussed. Predicates hosting the incorporated nouns in Vietnamese are mostly transitive, while NCOs complement unergative verbs. Furthermore, the data show that some restrictions on (P)INs are verified in Vietnamese. For instance, they cannot take a determiner, modifier, or be a proper name, while NCOs can. Due to these differences, I conclude that Vietnamese NCO constructions are not lexical compounds as claimed in the literature. The boundary between compounds in the language bears further investigation.

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THE INDEFINITE ARTICLE IN A CLASSIFIER LANGUAGE—HLAI

Hui-chi LEE
National Cheng Kung University
hclee6@mail.ncku.edu.tw

Abstract

This paper discusses the word 'one' in Hlai, a language of the Kra-Dai language family. The word *ɯ*^{55} 'one' has five uses: numeral use, presentative use, nonidentifiable specific reference, nonidentifiable nonspecific reference and nonreferential use. The last use relates to an indefinite-article function. Although Hlai has a classifier system and no plural markings, it does not fit Chierchia's (1998) notion of classifier languages. Nouns in Hlai are not necessarily modified by classifiers. The [*a*/*one* N] pattern (e.g., '*a/one chair*') occurs in Hlai. The numeral *ɯ*^{55} 'one' has undergone the process of grammaticalization to develop into an indefinite article.

Keywords: article, classifier language, indefinite article, Hlai

1 Introduction

This paper focuses on the indefinite article in Hlai. Partee (1987) points out that many languages (e.g., English) have overt determiners, including the definite article (e.g., English *the*) and the indefinite article (e.g., English *a*). Unlike English, Thai is a language lacking overt articles (Piriyawiboon 2010; Jenks 2011). Although Hlai and Thai belong to the same language group, Kra-Dai (see Ostapirat 2004, 2008), Hlai does not have an article-system like Thai.

According to Jiang (2015), articles are obligatory in some languages, like French, as in (1).

(1a) **(la) baleine joue*
the whale plays
'The whale is playing.'

(1b) **(les) baleines sont en train de disparaître*
the whales in the process of disappearing
i. 'The set of subspecies of whales is becoming extinct.'
ii. 'Whales are becoming extinct.' (Vergnaud and Zubizarreta 1992)

Articles do not occur in some languages at all, like Hindi, as in (2).

(2a) *kamre meN cuuhaa hai*
room in mouse is
'There's a mouse in the room.'

(2b) *kutte bahut bhau Nkte haiN*
dogs lot bark
'The dogs/Dogs bark a lot.' (Dayal 2004)

Articles can be either obligatory or optional in languages like English, as in (3).

(3a) **(The/A) dog is barking.*
(3b) *(The) dinosaurs are extinct.*

As for classifier languages, articles usually do not occur immediately with nouns and must co-occur with classifiers, as is the case in Mandarin, as in (4). Bare nouns are common in classifier languages.

(4a) **yi zhuozi / yi zhang zhuozi / zhuozi*
one table one CL table table
'one table/ one table/ table'

(4b) **liang zhuozi / liang zhang zhuozi / zhuozi*
two table two CL table tables
'two tables/ two tables/ tables'

(4c) **yi mi / yi li mi / mi*
one rice one grain rice rice
'one rice/ one grain of rice/ rice'

Chierchia (1998) points out that nouns in classifier languages behave very differently in several ways from those in non-classifier languages, such as Germanic, Romance and Slavic languages. Nouns in classifier languages generally do not have plural markers and articles. For example, they generally do not have a plural marker like *-s* or articles *a* and *an* in English. Chierchia (1998) also proposes a typology to distinguish argumental-NP languages from predicative-NP languages. NPs in Chinese-style languages are argumental because they can occur freely without articles, like *a*/*an*/*the* in English. They can occur in argumental positions relative to bare nouns. On the other hand, nouns in Romance languages occur in argumental positions and need to co-occur with articles. Chierchia assumes that nouns in Romance languages are predicative because nouns cannot freely occur in argumental positions. The third type of NPs are both argumental and predicative, like in Germanic and Slavic languages. They are argumental when mass or plural; they are predicative when countable or singular. In summary, NPs in languages can be categorized according to [±pred, ±arg] features. Chinese-style languages are [–pred, +arg]; Romance languages are [+pred, –arg]; Slavic/Germanic languages are [+pred, +arg].

(5) NP typology by Chierchia (1998)
(5a) [–pred, +arg] languages, e.g., Chinese
(5b) [+pred, –arg] languages, e.g., French
(5c) [+pred, +arg] languages, e.g., Slavic and German

Following Chierchia's (1998) typological framework, NPs in classifier languages can be summarized as follows.

(6) *NP [+arg, –pred]* languages
(6a) Generalized bare arguments
(6b) Mass noun extensions only
(6c) Absence of plural markings
(6d) Generalized classifier system

Thai is a classifier language (Jenks, 2011). As a member of the same language group, Kra-Dai languages, Hlai is also observed as a classifier language. Its classifier system is discussed in the following section. In a language like Hlai, according to Chierchia's (1998) hypothesis, plural markings are not active for the count portion of the lexicon. Nouns are arguments and can freely occur in argumental positions without any articles. However, some nouns in Hlai cannot occur freely in argumental positions. They need to occur with a determiner, *uu*^{55}, which is believed to be an indefinite article. The unique behaviors of this article are discussed in Sections 3 and 4 of this paper.

2 Distribution of the article *ɯ*^{55}

The Hlai indefinite article *ɯ*^{55} is a function word which basically indicates the numeral meaning *one*, such as *ɯ*^{55} *gaan*^{11} *ɯ*^{55} 'one hundred and one'. The distribution of the numeral use is shown in 2.1. It can also occur in the patterns [*ɯ*^{55} + CL + N] (in 2.2), and [*ɯ*^{55} + measure word + N] (in 2.3).

2.1 Numeral 'one'

The number 'one' is expressed by *ɯ*^{55} in Hlai, as in (7). In fact, the primary meaning of the word *ɯ*^{55} is the numeral meaning *one*.

(7a) *ɯ*^{55}, *ɬau*^{55}, *tshu*^{55}, *tsho*^{55}
one two three four
'one, two, three, four'

(7b) *ɯ*^{55} *gaan*^{11} *ɯ*^{55}
one hundred one
'one hundred and one'

When the word *ɯ*^{55} is used, it often indicates the numeral meaning one, as in (8).

(8) *eeŋ*^{55} *gua*^{11}*ɗun*^{33} *ɯ*^{55} *pau*^{121} *e*^{33}
older.brother marry one year PERF
'My older brother has been married for one year.'

2.2 ɯ^{55} *+ classifier + noun*

The numeral use of *ɯ*^{55} also occurs preceding classifiers and nouns. In Hlai, a noun mostly occurs with a corresponding classifier. The pairing of nouns and classifiers is not widely discussed in the previous literature (e.g., Ouyang and Zheng 1983, Yuan 1994). Classifiers can group nouns into classes on the basis of sematic characteristics of the nouns, such as shape, material, and animacy. This paper shows six types of classifiers. The most unmarked classifier is *hom*^{33}, which can modify almost all objects with an [-animate] feature, such as *room*, *boat*, *bag*, or *house*. Even abstract objects like *night* and *afternoon* can be modified by *hom*^{33}. Examples are shown in (9) to (14).

hom^{33} + [-animate]

(9) *hou*^{33} *tɯɯh*^{13} *ɯ*^{55} *hom*^{33} *faaŋ*^{55} *ŋan*^{33} *ɬen*^{33}
1SG live one CL room also good
'It is fine for me to stay in whichever room.'

(10) *nam*^{55} *laŋ*^{55} *kom*^{33} *ɯ*^{55} *hom*^{33} *tuun*^{121}
water wave bury one CL boat
'The heavy wave sank a boat.'

(11) *liaŋ*^{51}*-liaŋ*^{51} *lau*^{51} *ɯ*^{55} *hom*^{33} *ɗe*^{33} *ŋan*^{33} *koom*^{33} *ko*^{55} *mau*^{51}
on.the.fly choose one CL bag all can put thing
'Any bag you choose, you can put things in.'

(12) *ɯ*^{55} *hom*^{33} *ploŋ*^{55} *vei*^{11} *laai*^{55} *rooi*^{15} *guaai*^{33}
one CL house NEG see deer EXP
'No one in the family has seen any deer.'

(13) *ploŋ*^{55} *tau*^{33} *ɗuuu*^{33} *hou*^{33} *kau*^{121} *u*^{55} *hom*^{33} *fan*^{33}
house 2PL give 1SG sleep one CL night
'Allow me to stay in your house for one night.'

(14) *hou*^{33} *gaŋ*^{15} *kaai*^{15}*-ma*^{51} *thau*^{55} *pha*^{55} *u*^{55} *hom*^{33} *thau*^{55}*-van*^{11}
1SG stand place-that wait father one CL afternoon
'I was standing there, waiting for my father for the whole afternoon.'

The classifier *laŋ*^{33} is for those objects with a [+animate] feature, including both human and non-human nouns. Examples of words that co-occur with this classifier are *duck*, *chicken*, *fish* and *thief*.

laŋ^{33} + [+animate]

(15) *vei*^{11} *ɗuuh*^{55} *u*^{55} *laŋ*^{33} *ɓet*^{55} *tau*^{11} *nam*^{55}
NEG have one CL duck down water
'There was not one duck that got down to the water.'

(16) *hau*^{51} *u*^{55} *laŋ*^{33} *khai*^{33} *vei*^{11} *hau*^{55} *toon*^{121}
that one CL chicken NEG kill arrive
'That chicken wasn't killed.'

(17) *dza*^{33} *u*^{55} *laŋ*^{33} *ɬa*^{33} *vei*^{11} *pooh*^{55} *toon*^{121}
leave one CL fish NEG grasp arrive
'There is still one fish that has not been caught.'

(18) *pha*^{55} *man*^{55} *u*^{55} *laŋ*^{33} *ɓui*^{33} *pook*^{55} *ka*^{51} *toon*^{121}
father only one CL thief grasp cannot arrive
'There was only one thief my father didn't catch.'

The classifier *ɗan*^{51} is for long-shaped objects, such as *river* and *rope*, as in (19) and (20).

ɗan^{51} + *river, rope*

(19) *ni*^{51} *u*^{55} *ɗan*^{51} *nam*^{55} *tai*^{51} *tiah*^{55}, *pook*^{55} *vei*^{11} *toon*^{121} *ɬa*^{33}
this one CL river very dirty grasp NEG arrive fish
'This river is so dirty that we can't catch any fish.'

(20) *u*^{55} *ɗan*^{51} *ɗaai*^{33}
one CL rope
'one rope'

The classifier co-occurs with clothes is *fan*^{55}, as in (21).

fan^{55} + *clothes*

(21) *pi*^{15} *tooh*^{55} *ni*^{51} *u*^{55} *fan*^{55} *feeŋ*^{15} *liaŋ*^{51} *e*^{33}
mother wash this one CL clothes clean PERF
'Mother washed the clothes clean.'

When fingers are spoken about, the classifier *phuun*^{55} is used, as in (22).

phuun^{55} + *finger*

(22)	*dza*^{33}	*ɯ*^{55}	*phuun*^{55}	*ɬiaŋ*^{121}	*vei*^{11}	*ɗɯɯ*^{33}	*guui*^{55}	*ŋam*^{51}	*toon*^{121}
	leave	one	CL	finger	NEG	let	tiger	bite	arrive

'One finger is left without being bitten by the tiger.'

When land is quantified, the classifier *voon*^{15} is used, as in (23).

voon^{15} + *land*

(23)	*ni*^{51}	*voon*^{15}	*fan*^{11}	*ɗɯɯ*^{33}	*mɯɯ*^{33}
	this	CL	land	give	2SG

'This piece of land is given to you.'

As the above examples have shown, classifiers in Hlai classify nouns according to characteristics of entities.

2.3 ɯ^{55} + measure word + noun

In addition to classifiers, *ɯ*^{55} can co-occur with measure words and nouns. The term 'measure word' refers to words such as *acre* and *kilo*, which generally measure a portion of the entity specified in a following noun, e.g., *a kilo of apples*. The measure words can be extended to words which can designate and express quantification, e.g., *box* in *a box of apples*. Measure words in Hlai are also very abundant, for example, *bowl*, *pot*, *bundle* and *side*, as shown in (24)-(27). The word *ɯ*^{55} co-occurring with measure words is also interpreted as a numeral 'one'.

guau^{33} 'bowl'

(24)	*ni*^{51}	*ɯ*^{55}	*guau*^{33}	*ɓiaŋ*^{51}	*mut*^{55}*-ka*^{15}	*vei*^{11}	*toon*^{55}
	this	one	bowl	rice.wine	rice-glutinous.rice	NEG	fierce

'The bowl of rice wine isn't strong.'

thau^{33} 'pot'

(25)	*pi*^{15}	*rooŋ*^{121}	*ɯ*^{55}	*thau*^{33}	*tha*^{51}	*ni*^{51}	*thiŋ*^{33}	*e*^{33}
	mother	cook	one	pot	rice	this	rice.crust	PERF

'Mother overcooked this pot of rice.'

khoon^{55} 'bundle'

(26)	*ɯ*^{55}	*khoon*^{55}	*kun*^{15}
	one	bundle	firewood

'a bundle of firewood'

feeŋ^{33} 'side'

(27)	*tshai*^{33}	*thaai*^{51}	*tshuuŋ*^{55}*-tsha*^{33}	*ɯ*^{55}	*feeŋ*^{33}	*tshuuŋ*^{55}*-tsha*^{33}	*plaau*^{33}	*e*^{33}
	wood	hit	hole-eye(eye)	one	side	hole-eye(eye)	blind	PERF

'(Somebody) was hit by a piece of wood, so he is blind in one of his eyes.'

Abstract nouns such as *half* and *day* can also be used as measure words in Hlai, as in (28) and (29).

thoon^{33} 'half'

(28)	*hou*^{33}	*lau*^{51}	*vei*^{11}	*ɗaan*^{55}	*ɯ*^{55}	*thoon*^{33}	*vei*^{11}	*ɗuuh*^{55}	*e*^{33}
	1SG	eat	NEG	to	one	half	NEG	have	PERF

'(Two pieces of taro had been eaten.) I haven't eaten even half a piece.'

(29) *pa*^{11} *phuun*^{55} *maai*^{55} *hou*^{33} *vei*^{11} *lau*^{51} *ɗaan*^{55} *ɯ*^{55} *thoon*^{33}
five CL sugarcane 1SG NEG eat arrive one half
'I only ate some of the five sugarcanes.'

As seen in these examples, measure words in Hlai can be various, based on the context.

3 Readings of '*ɯ*^{55} + noun'

For a classifier language, it is not common to have a [*one* + noun] pattern. That is, an example like *a book* is not an acceptable form for a classifier language. For example, **yi shu* 'a book/one book' is not acceptable in Mandarin. The classifier *ben* for a book is obligatory between the number and the noun, *yi ben shu* 'a book/one book'.

3.1 Nouns with a numeral reading

Unlike nouns in typical classifier languages, nouns in Hlai allow the [*ɯ*^{55} + noun] form, similar to the English-style form [*a*/*an* + noun]. The [*ɯ*^{55} + noun] occurs freely with nouns of various classes, e.g., *chair*, *stool*, *axe*, *sickle*, *road*, *belly button*, *waist* and *day*, as in (30) to (36).

(30) *ko*^{55} *khien*^{33} *tɯ*^{11} *ɯ*^{55} *leeŋ*^{11}
put arm at one chair
'Rest your arm on the chair armrest.'

(31) *guei*^{15} *tsoŋ*^{55} *ɓat*^{55} *ɯ*^{55} *ɗeŋ*^{11} *e*^{33}
fat sit broken one stool PERF
'The fat man broke a stool by sitting on it.'

(32) *na*^{33} *ɗuuu*^{33} *ɯ*^{55} *ɓua*^{51} *fet*^{55} *tau*^{11} *fan*^{11}
3SG hold one axe throw fall land
'He threw the axe onto the ground.'

(33) *guai*^{121} *ɯ*^{55} *liim*^{33} *he*^{33} *ka*^{51} *thun*^{33} *kan*^{15}
NEG one sickle what cannot saw grass
'There is no sickle that cannot cut grass.'

(34) *tsaɯ*^{55} *fei*^{33} *man*^{33} *ɯ*^{55} *kuun*^{33} *e*^{33}
grandma walk correct one road PERF
'Grandmother walked on the right street.'

(35) *guuŋ*^{11}*-łuuuh*^{55}*-kho*^{51} *phuuun*^{33}*-ni*^{51} *goom*^{15} *ɯ*^{55}*-ɦuuu*^{11} *na*^{33}
younger.sibling-DIM-FEM generation-this(now) rub one-belly.button 3SG
'The younger sister is rubbing her belly button.'

(36) *puuun*^{11} *guan*^{15} *hou*^{33} *lau*^{51} *ɯ*^{55} *tshuŋ*^{55} *ni*^{51}
come knead 1SG help one waist this
'massage my waist.'

Sentences (37) and (38) are not grammatical when the word *ɯ*^{55} is replaced by any plural nouns such as *two chairs* or *three chairs*.

(37) **ko*^{55} *khien*^{33} *tɯ*^{11} *ɬau*^{55} *leeŋ*^{11}
put arm at two chair
'Put the arms on two chairs.'

(38) **guei*^{15} *tsoŋ*^{55} *ɓat*^{55} *ɬau*^{55} *ɗeŋ*^{11} *e*^{33}
fat sit broken two stool PERF
'The fat man broke two stools by sitting on it.'

The word *ɬau*^{55} 'two' needs to co-occur with classifiers to take the form [number + CL + noun], for example, *ɬau*^{55} *hom*^{33} *leeŋ*^{11} 'two chairs' and *ɬau*^{55} *hom*^{33} *ɗeŋ*^{11} 'two stools'. This fact shows that *ɯ*^{55} does not simply indicate the numeral meaning 'one' when it occurs in the [*ɯ*^{55} + noun] form.

3.2 Nouns with a non-numeral reading

The word *ɯ*^{55} generally expresses 'one' as shown in the previous section. However, the word *ɯ*^{55} can have meanings other than numeral. It can express indefiniteness without conveying a numeral meaning. This can be applied to countable nouns such as *ɯ*^{55} *guau*^{33} 'a bowl' or mass nouns such as *ɯ*^{55} *za*^{11} 'medicine', *ɯ*^{55} *tshai*^{33} 'vegetable' and *ɯ*^{55} *tha*^{51} 'rice'. Examples include nouns like *chili*, *medicine*, *grasshopper*, *betel nut*, *bean* and *vegetable*, as in (39) to (44).

(39) *hou*^{33} *ai*^{55} *lau*^{51} *ɯ*^{55}*-fiu*^{15}
1SG unwilling eat chili
'I do not eat chili.'

(40) *muuu*^{33} *zou*^{55} *lau*^{51} *ɯ*^{55}*-za*^{11}
2SG need.not eat medicine
'You need not take medicine.'

(41) *pi*^{15} *keeŋ*^{33} *ɯ*^{55}*-tɯɯh*^{13} *lau*^{51}
mother fry grasshopper eat
'Mom fried grasshoppers to eat.'

(42) *zou*^{55}*-moŋ*^{11} *lau*^{33}*-lau*^{33} *hei*^{33} *tshat*^{55} *ɯ*^{55}*-looŋ*^{55} *lau*^{51}
deontic.NEG anytime go buy betel.nut eat
'Do not go to buy betel nuts at any time.'

(43) *siio*^{55} *ɯ*^{55}*-tok*^{55} *ɗuuu*^{33} *hou*^{33}
take bean give 1SG
'Give me beans.'

(44) *guuŋ*^{11}*-ɬɯɯh*^{55}*-kho*^{51} *ran*^{121}*-ran*^{121}*-van*^{11} *rooŋ*^{121} *ɯ*^{55} *thau*^{33} *ɯ*^{55}*-tshai*^{33}
younger.sibling-DIM-FEM every-every-day cook one pot vegetable
'Younger sister often cooks a pot of vegetables.'

Notice that the word *ɬau*^{55} 'two' cannot replace the word *ɯ*^{55} in the example *ɯ*^{55}*-fiu*^{15} 'chili', *ɯ*^{55}*-za*^{11} 'medicine', *ɯ*^{55}*-tɯɯh*^{13} 'grasshopper', *ɯ*^{55}*-looŋ*^{55} 'betel nut', *ɯ*^{55}*-tok*^{55} 'bean' and *ɯ*^{55}*-tshai*^{33} 'vegetable'. That is, examples like *ɬau*^{55} *looŋ*^{55} 'two betel nuts', *ɬau*^{55} *tɯɯh*^{13} 'two grasshoppers', *ɬau*^{55} *tok*^{55} 'two beans' or *ɬau*^{55} *tshai*^{33} 'two vegetables' are ungrammatical in Hlai. Only when a classifier is added between the numeral and the noun is the phrase grammatical, as in (45).

(45a) *ɯ*^{55}-*fiu*^{15} ‘chili peppers’; **łau*^{55} *fiu*^{15} ‘two chilis’; *łau*^{55} *hom*^{33} *fiu*^{15} ‘two chilis’
(45b) *ɯ*^{55}-*za*^{11} ‘medicine’; **łau*^{55} *za*^{11} ‘two medicines’; *łau*^{55} *hom*^{33} *za*^{11} ‘two medicines’
(45c) *ɯ*^{55}-*tɯɯh*^{13} ‘grasshopper’; **łau*^{55} *tɯɯh*^{13} ‘two grasshoppers’; *łau*^{55} *laŋ*^{33} *tɯɯh*^{13} ‘two grasshoppers’
(45d) *ɯ*^{55}-*looŋ*^{55} ‘betel nut’; **łau*^{55} *looŋ*^{55} ‘two betel nuts’; *łau*^{55} *hom*^{33} *looŋ*^{55} ‘two betel nuts’
(45e) *ɯ*^{55}-*tok*^{55} ‘bean’; **łau*^{55} *tok*^{55} ‘two beans’; *łau*^{55} *hom*^{33} *tok*^{55} ‘two beans’
(45f) *ɯ*^{55}-*tshai*^{33} ‘vegetable’; **łau*^{55} *tshai*^{33} ‘two vegetables’; *łau*^{55} *hom*^{33} *tshai*^{33} ‘two vegetables’

Moreover, example (44) shows the [*ɯ*^{55} + noun] pattern, as in *ɯ*^{55}-*tshai*^{33} ‘vegetable’, is distinct from the [*ɯ*^{55} + CL + noun] form, as in *ɯ*^{55} *thau*^{33} *ɯ*^{55}-*tshai*^{33} ‘a pot of vegetables’. This indicates that the word *ɯ*^{55} is different in *ɯ*^{55}-*tshai*^{33} as it is in *ɯ*^{55} *thau*^{33}.

The word *ɯ*^{55} in *ɯ*^{55}-*tshai*^{33}, *ɯ*^{55}-*fiu*^{15}, *ɯ*^{55}-*za*^{11}, *ɯ*^{55}-*tɯɯh*^{13} and *ɯ*^{55}-*looŋ*^{55} does not indicate numeral meanings. In examples (41) to (43), *ɯ*^{55}-*tɯɯh*^{13} ‘grasshopper’, *ɯ*^{55}-*looŋ*^{55} ‘betel nut’ and *ɯ*^{55}-*tok*^{55} ‘bean’, these nouns are assumed to have indefinite plural interpretations. In other words, the [*ɯ*^{55} + noun] sequence is not related to number (singular/plural) objects. The word *ɯ*^{55} is associated with the indefiniteness meaning. Schwarz (2009) observes two types of definites: unique definites and anaphoric definites. Following Schwarz (2009), a nominal phrase is interpreted as definite if it refers to unique referent(s) or to previously mentioned referent(s). We use these two diagnostics to detect whether the nominal phrases in (39) to (44) are definite or not. By examining the contexts of the sentences, we find that the nouns in the [*ɯ*^{55} + noun] form in (39) to (44) do not have definite but rather indefinite interpretations.

4 Development of *ɯ*^{55} in Hlai

This section discusses the development process of the numeral ‘one’ into a grammaticalized marker of indefiniteness. Heine (1997) proposes a five-stage grammaticalization for the word ‘a’. This word develops from indicating the specific quantity of ‘one’ into additional senses, as in (46).

(46a) Numeral
I need an hour and a half.
(46b) Presentative use
A man came up the front stairway.
(46c) Nonidentifiable specific reference
He bought a house last year.
(46d) Nonidentifiable nonspecific reference
He wants to buy a house in this area; any house will do.
(46e) Nonreferential use
He is a good chef.

The word *ɯ*^{55} ‘one’ in Hlai is examined according to these five stages of grammaticalization. The result shows that the word *ɯ*^{55} has all of the senses as in English, and this suggests it has undergone grammaticalization, as shown in (47) to (51).

I. Numeral use

(47a)	*ɯ*^{55},	*łau*^{55},	*tshu*^{55},	*tsho*^{55}
	one	two	three	four
	‘one, two, three, four’			
(47b)	*ɯ*^{55}	*gaan*^{11}	*ɯ*^{55}	
	one	hundred	one	
	‘one hundred and one’			

II. Presentative use

(48) *ɯ*^{55} *aau*^{33} *za*^{11} *pɯɯn*^{11}
one person old come
'An old man came.'

III. Nonidentifiable specific reference

(49) *na*^{33} *ɗɯɯ*^{33} *ɯ*^{55} *ɓua*^{51} *fet*^{55} *tau*^{11} *fan*^{11}
3SG hold one axe throw fall land
'He threw an axe onto the ground.'

IV. Nonidentifiable nonspecific reference

(50) *hou*^{33} *zom*^{33} *vien*^{11} *ɯ*^{55} *łɯɯm*^{55}
1SG want wear one shoe
'I want to wear shoes.'

V. Nonreferential use

(51) *hou*^{33} *ai*^{55} *lau*^{51} *ɯ*^{55}*-fiu*^{15}
1SG unwilling eat chili
'I do not eat chili.'

ɯ^{55} with a nonreferential use co-occurs not only with common nouns but also with abstract nouns, such as *self* and *pity*, as in (52), (53) and (54).

ɯ^{55} *tsaɯ*^{15} 'self'

(52) *o*^{51}*-Li*^{51} *ka*^{51} *lau*^{51} *tha*^{51} *ɯ*^{55}*-tsaɯ*^{15}
FEM-Li cannot eat rice self
'Li cannot eat rice by herself.'

ɯ^{55}*-gen*^{11} 'pity'

(53) *hou*^{33} *laai*^{55} *na*^{33} *vei*^{11} *ɯ*^{55}*-gen*^{11}
1SG see 3SG NEG pity
'I don't feel pity for him.'

(54) *hou*^{33} *vei*^{11} *lau*^{51} *mɯɯ*^{33} *ɯ*^{55}*-gen*^{11} *hou*^{33}
1SG NEG need 2SG pity 1SG
'I don't need your pity.'

The word *ɯ*^{55}*-tsaɯ*^{15} is interpreted as 'self' and *ɯ*^{55}*-gen*^{11} as 'pity'. The words 'self' and 'pity' are not associated with any numeral meanings. The word *ɯ*^{55} is not related to singular/plural meanings, either. Like an indefinite article, *ɯ*^{55} performs a non-referential function.

The word *ɯ*^{55} developed from its numeral use into an indefinite article with a non-referential use. The indefinite article can modify both singular/plural and mass nouns. The word *ɯ*^{55} has five senses: numeral use, presentative use, nonidentifiable specific reference, and nonidentifiable nonspecific reference. The word *ɯ*^{55} can be currently used as a robust indefinite article.

5 Conclusion

This paper has discussed the following three issues of the word *ɯ*^{55}: (i) its distribution, (ii) its article usage, and (iii) its grammaticalization. One of the functions of the word *ɯ*^{55} includes numeral use: [*ɯ*^{55} + classifier + noun], [*ɯ*^{55} + measure + noun] and [*ɯ*^{55} + noun]. The word *ɯ*^{55} can be used as a numeral, the number 'one'. It can also occur in two patterns: [*ɯ*^{55} + classifier + noun] and [*ɯ*^{55} + measure + noun]. These uses are often found in classifier languages. However, the [*ɯ*^{55} + noun] pattern is rarely observed and often unacceptable in classifier languages. For example, languages with Chinese-like

traits do not accept phrases like **yi shu* 'a book/one book'. Instead of [*one* + noun], classifiers are obligatory in the [*one* + CL + noun] pattern. The [*one* + noun] pattern in Hlai is thus unique among classifier languages. While the word *ɯ*^{55} is assumed to function as an indefinite article in Hlai, it is different from the English indefinite article *a*/*an*. The word *ɯ*^{55} is irrelevant to the meaning of number (singular/plural) or countability. It is related to indefiniteness.

The development of the word *ɯ*^{55} is also examined using Heine's (1997) proposal of the process of grammaticalization of the indefinite article in English. Hlai *ɯ*^{55} has developed the five functions as per Heine's description of English '*a*/*an*'. This development of grammaticalization might begin with a numeral use and end with a nonreferential use, as in (55).

(55) *ɯ*^{55}: numeral use, presentative use, nonidentifiable specific reference, nonidentifiable nonspecific reference, nonreferential use.

The nonreferential *ɯ*^{55} has developed a range of applications to various types of nouns with various semantic properties and can even co-occur with abstract nouns such as *self* and *pity*.

Hlai is a classifier language that does not fully fit Chierchia's (1998) description of classifier languages. Hlai does have a clear classifier system and no plural markings. However, not all nouns in Hlai are mass, nor are they necessarily modified by classifiers. The fact that the numeral *ɯ*^{55} 'one' has developed into an indefinite article presents a unique phenomenon among classifier languages.

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CLITICIZATION OF OBLIQUE CASE MARKERS IN SAKIZAYA

Chihkai LIN
National Taiwan University of Science and Technology
linchihkai@gmail.com

Abstract

This paper examines the cliticization of case markers in Sakizaya, with a particular focus on oblique case markers, which have not been previously analyzed alongside nominative and genitive markers. Building on Lin's (2020) study, which explored cliticization patterns only for nominative and genitive markers, this research introduces new data on oblique case markers to reassess the proposed type difference and distance effect. This paper collects data from the Online Sakizaya Dictionary, focusing on sentences with two noun phrases—one oblique and the other nominative or genitive. The analysis identifies four possible word orders: XP + NP_{NOM} + NP_{OBL}, XP + NP_{OBL} + NP_{NOM}, XP + NP_{GEN} + NP_{OBL}, and XP + NP_{OBL} + NP_{GEN}. The findings confirm Lin's type difference hypothesis, showing that nominative case markers are more prone to cliticization than genitive ones, with oblique markers exhibiting a similar behavior. Additionally, this paper corroborates the distance effect, indicating that case markers in the first noun phrase are more likely to cliticize than those in the second. A significant interaction between case marker type and position is also found, with nominative markers favoring cliticization in the first noun phrase, while genitive and oblique markers tend to cliticize in the second.

Keywords: Cliticization, Sakizaya, oblique case marker, type difference, distance effect
ISO 639-3 codes: szy

1 Introduction

This paper examines the cliticization of oblique case markers in Sakizaya, a Formosan language spoken in Hualien County, eastern Taiwan. The case markers, which precede a head noun to form a noun phrase, are categorized into three primary types: nominative (K-type), genitive (N-type), and oblique (T-type), as detailed in Table 1.[1]

Table 1: *Case markers in Sakizaya*

		Nominative	**Genitive**	**Oblique**
Proper nouns	Singular	ci	ni	ci … -an
	Plural	ca/cini	na/nini	ca … -an/ cini … -an
General nouns		ku	nu	tu

[1] In Sakizaya, there is an additional case marker, *u*, specifically used for non-human referents.

(i) u takal kuyni. (From Shen 2022:43)
u takal *kuyni*
U table this
'This is a table.'

The non-human case marker *u* typically appears in the initial position, introducing a copulative sentence. Due to its positional constraint, this paper will not examine this particular case marker.

The case markers are distinguished based on the type of head noun, whether proper or general. For general nouns, the nominative case marker is *ku*, the genitive case marker is *nu*, and the oblique case marker is *tu*, as illustrated in (1).[2]

(1) mukan ku babalaki tu titi nu pabuy. (From Shen 2018:55)

mu-kan	*ku*	*babalaki*	*tu*	*titi*	*nu*	*pabuy*
AF-eat	NOM	the.elder	OBL	flesh	GEN	pig

'The old man is eating pork.'

Proper nouns are further divided based on the number of the head noun, distinguishing between singular and plural forms. For singular nouns, the nominative case marker is *ci*, the genitive is *ni*, and the oblique is *ci … -an*, as shown in (2).

(2a) miazih ci ama tu cudad ni Panay. (From Shen 2018:59)

mi-azih	*ci*	*ama*	*tu*	*cudad*	*ni*	*Panay*
AF-see	NOM	father	OBL	book	GEN	Panay

'Father is reading Panay's book.'

(2b) mabulah kaku ci Panayan. (From Shen 2022:41)

ma-bulah	*kaku*	*ci*	*Panay-an*
AF-miss	1SG	OBL	Panay-AN

'I miss Panay.'

For plural forms, the nominative case markers are *ca* or *cini*, the genitive markers are *na* or *nini*, and the oblique markers are *ca … -an* or *cini … -an*, as shown in (3).

(3a) tabuyu' amin cini Panay mikama. (From Sakizaya Online Dictionary)

ta-buyu'	*amin*	*cini*	*Panay*	*mi-kama*
TA-mountain	all	NOM	Panay	AF-tangerine

'The Panay family goes to mountain to pick tangerines.'

(3b) manamuh ci ama ca panayan. (From Shen 2018: 57)

ma-namuh	*ci*	*ama*	*ca*	*panay-an*
AF-like	NOM	father	OBL.PL	Panay-AN

'Father likes Panays.'

(3c) ka-namuh-en na panay kiza wawa. (From Shen 2018:58)

ka-namuh-en	*na*	*panay*	*kiza*	*wawa*
KA-like-PF	GEN.PL	Panay	that.NOM	child

'Panays like that child.'

According to Tsukida (1993) and Shen (2016, 2018, 2022), the verb and noun phrases at the syntactic level adhere to a word order of verb + NP_1 + NP_2, where the sequence of the nominative and genitive noun phrases varies depending on the verb's focus, as demonstrated in (3b) and (3c). When the verb has agent focus (3b), the nominative noun phrase immediately follows the verb, with the oblique noun phrase appearing after the nominative noun phrase. Conversely, when the verb has patient focus

[2] The abbreviations of the glosses in this paper are listed as follows: AF = agent focus, CM = case marker, GEN = genitive, INS = instrument, NEG = negation, NOM = nominative, N = noun, NP = noun phrase, OBL = oblique, PF = patient focus, PRF = perfective, PPh = phonological phrase, PL = plural, PW = prosodic word, PN = proper noun, SG = singular, and V = verb.

(non-agent focus) (3c), the genitive noun phrase directly follows the verb and precedes the nominative noun phrase.

At the phonological level, the verb corresponds to a prosodic word, while the subsequent noun phrases are considered independent phonological phrases. Consequently, the syntactic and phonological structures should theoretically align, as illustrated in (4) and exemplified in (5).

(4)

Syntax:	XP	|	NP_1	|	NP_2
Phonology:	Prosodic word	|	Phonological phrase	|	Phonological phrase

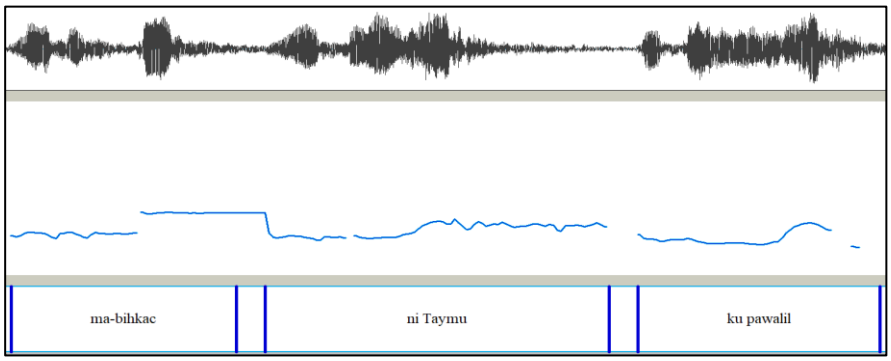
(5) mabihkac ni Taymu ku pawalil. (From Sakizaya Online Dictionary)

ma-bihkac	*ni*	*Taymu*	*ku*	*pawalil*
PF-catch	GEN	Taymu	NOM	rabbit

'Taymu catches a rabbit.'

The phonetic realization of (5), as demonstrated in (6), clearly illustrates the alignment of syntactic and phonological structures. Specifically, the left edge of the case markers *ni* and *ku* aligns with the left boundary of the corresponding noun phrases.

(6)



Syntax	[	$]_V$ [	$]_{NP}$ [	$]_{NP}$
Phonology	[	$]_{PW}$ [	$]_{PPh}$ [	$]_{PPh}$

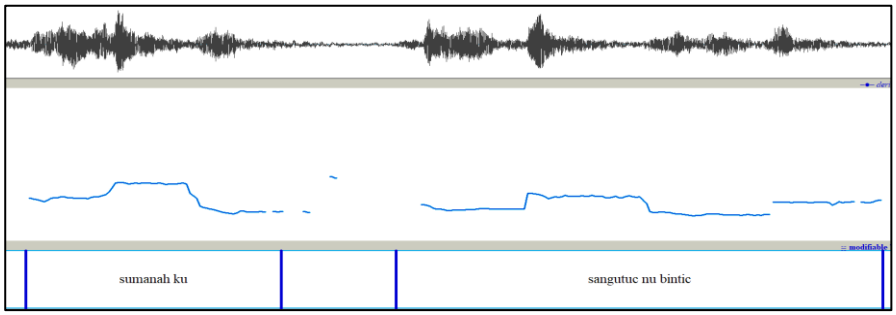
Since the case marker and the head noun together form a noun phrase (= a phonological phrase), the case markers are expected to remain with the head noun within the same noun phrase. However, Lin (2020) has demonstrated a discrepancy between syntactic and phonological phrases, wherein the case marker detaches from the head noun and attaches to the preceding word. An example of this phenomenon is presented in (7), with its phonetic realization illustrated in (8).

(7) sumanah ku sangutuc nu bintic. (From Sakizaya Online Dictionary)

sumanah ku		*sangutuc nu*		*bintic*
red	NOM	beak	GEN	kingfisher

'Kingfisher's beak is red.'

(8)



Syntax	[[	$]_V$ ku]	[[	$]_N$ [	$]_{NP}$]
Phonology	[[	$]_{PW}$ ku]	[		$]_{PPh}$

The demarcation of the nominative case marker *ku* in (8) indicates a cliticization process (Zwicky 1977; Zwicky and Pullum 1983, Klavans 1985; Selkirk 1995; Anderson 2005; Vogel 2009), suggesting that *ku* is associated with the preceding verb *sumanah* 'red' rather than the following noun *sangutuc* 'beak'. Additionally, the genitive case marker *nu* exhibits a different pattern, forming a larger phonological phrase that includes both the preceding noun *sangutuc* 'beak' and the following noun *bintic* 'kingfisher'.

Lin (2020) investigated the cliticization of nominative and genitive case markers in Sakizaya, focusing specifically on sentences containing two noun phrases. Lin's (2020) results revealed two key findings: (a) a type difference and (b) a distance effect concerning the cliticization of these markers. The type difference indicates that nominative case markers are more prone to cliticization compared to genitive case markers (70% for nominative vs. 50% for genitive). The distance effect suggests that the proximity of the case markers to the predicate influences their likelihood of cliticization. Specifically, in a sentence structured as predicate + NP_1 + NP_2, the case marker in NP_1 is more likely to undergo cliticization than the case marker in NP_2.

Although Lin (2020) investigated the phonological representation of case markers in Sakizaya, he focused exclusively on nominative and genitive case markers, omitting the oblique case marker, which is one of the three categories of case markers in Sakizaya. To address this, the current paper will examine the oblique case marker and re-evaluate the type difference and distance effect in light of its inclusion. To re-evaluate the type difference and distance effect in Lin's (2020) findings, the paper is organized as follows: Section 2 details the processes of data collection, identification, and classification, with a specific focus on sentences containing two noun phrases—one oblique and the other either nominative or genitive. Section 3 presents the results related to the oblique case marker in the dataset. Section 4 compares these findings with those from Lin (2020) and discusses both the type difference and distance effect, as well as their interaction. Section 5 concludes the paper.

2 Methodology

The data for oblique case markers were collected from the Online Sakizaya Dictionary, available at https://e-dictionary.ilrdf.org.tw/ais/search.htm, sponsored by the Indigenous Languages Research and Development Foundation. This online dictionary includes recordings of the examples; however, some recordings are missing or mismatched. Sentences for which recordings were unavailable have been excluded from this study.

The steps for data collection are as follows: First, the complete version of the online dictionary was downloaded in PDF format, comprising 329 pages. The search function was then used to locate oblique case markers. To ensure comparability with Lin's (2020) analysis of nominative and genitive case markers, only sentences containing *tu* for general nouns were collected. Case markers for proper nouns, such as *ci … -an* and *ca … -an*/*cini … -an*, were excluded from the dataset. All collected sentences were transferred to an Excel file, and sentences containing exactly two noun phrases were marked for further analysis. In this context, four possible word orders are considered, as illustrated in (9) with examples provided in (10).

(9) $XP + NP_{NOM} + NP_{OBL}$
$XP + NP_{OBL} + NP_{NOM}$
$XP + NP_{GEN} + NP_{OBL}$
$XP + NP_{OBL} + NP_{GEN}$

(10a) miaam ku miaamay tu hemay. (From Sakizaya Online Dictionary)

mi-aam	*ku*	*miaamay*	*tu*	*hemay*
AF-porridge	NOM	beggar	OBL	rice

'The beggar begs for food (rice).'

(10b) caduk tu amutu ku misiyagiay. (From Sakizaya Online Dictionary)

caduk	*tu*	*amutu*	*ku*	*misiyagiay*
shovel	OBL	concrete	NOM	cement.worker

'The cement worker shovels concrete.'

(10c) mapabeli tu nu maku tu paysu'. (From Sakizaya Online Dictionary)

ma-pabeli=tu	*nu*	*maku*	*tu*	*paysu'*
PF-pay=PRF	GEN	1SG	OBL	money

'I have paid the money.'

(10d) mikiskis tu banuh nu pabuy. (From Sakizaya Online Dictionary)

mi-kiskis	*tu*	*banuh*	*nu*	*pabuy*
AF -shave	OBL	fur	GEN	pig

'Shave the pig.'

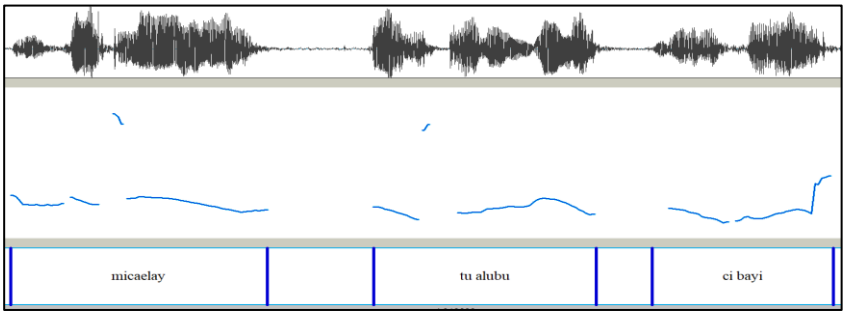
The demarcation of the case markers is based on Lin's (2020) analysis, resulting in four possible outcomes: on the left edge, on the right edge, on both edges, and no demarcation. Firstly, demarcation on the left edge occurs when the case marker remains within the same noun phrase. For instance, in (11), the oblique case marker demonstrates left-edge demarcation with *tu*, as illustrated in (12).

(11) micaelay tu alubu ci bayi. (From Sakizaya Online Dictionary)

mi-caelay	*tu*	*alubu*	*ci*	*bayi*
AF-carry	OBL	bag	NOM	elder.laby

'The elder lady carries a bag.'

(12)



Syntax	[	]$_V$	[	]$_{NP}$	[	]$_{NP}$
Phonology	[	]$_{PW}$	[	]$_{PPh}$	[	]$_{PPh}$

Demarcation on the right edge and no demarcation can be illustrated by the case markers in (8). The nominative case marker *ku* exemplifies demarcation on the right edge, while the genitive case marker

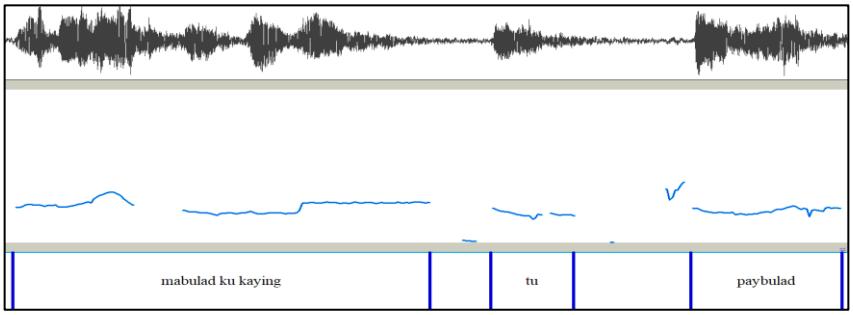
nu demonstrates no demarcation. Although rare, it is theoretically possible for a case marker to exhibit demarcation on both edges, as shown in (13) and (14).

(13) mabulad ku kaying tu paybulad. (From Sakizaya Online Dictionary)

ma-bulad	*ku*	*kaying*	*tu*	*paybulad*
AF-menstruate	NOM	lady	OBL	every.month

'A woman menstruates every month.'

(14)



Syntax	[[	]$_{V}$ [	]$_{NP}$]	tu	[	]$_{N}$
Phonology	[[	]$_{PW}$ [	]$_{PPh}$]	tu	[	]$_{pw}$

In (14), the oblique case marker stands independently, neither integrating with the preceding nor the following noun. Sentences like (14) are included in the corpus but are excluded from further discussion.

Consequently, there are four possible patterns: two for cases involving three parsed units and two for cases involving two parsed units, as illustrated in (15).

(15)	a.	[XP] +	[CM NP] +	[CM NP]	(no cliticization)
	b.	[XP + CM]	[NP + CM]	[NP]	(two cliticizations)
	c.	[XP + CM]	[NP + CM NP]		(one cliticization)
	d.	[XP] +	[CM NP + CM NP]		(no cliticization)

In (15a), the case markers do not undergo cliticization, resulting in three parsed units: [XP] + [CM NP] + [CM NP]. In (15b), both case markers undergo cliticization, yet the structure remains at three parsed units, with the second noun phrase remaining separate ([XP + CM] [NP + CM] [NP]). In (15c), the first case marker attaches to the predicate, while the second does not, with the first head noun and the second noun phrase forming a larger unit ([XP + CM] [NP + CM NP]). In (15d), there is no cliticization of the case markers, but the two noun phrases are not treated as separate phrases ([XP] + [CM NP + CM NP]). After collected sentences are marked with their respective demarcations and classified according to their cliticization patterns, the results will be reported in Section 3.

3 Results

The results presented in this section include the four word orders outlined in (9). The dataset comprises 290 sentences corresponding to these word orders, as shown in Table 2. In Table 2, there are 187 sentences for XP + NP_{NOM} + NP_{OBL}, 60 sentences for XP + NP_{OBL} + NP_{NOM}, 40 sentences for XP + NP_{GEN} + NP_{OBL}, and 3 sentences for XP + NP_{OBL} + NP_{GEN}.

Table 2: *General distributions of the four word orders*

Word orders	Sentences	Percent
XP + NP_{NOM} + NP_{OBL}	187	64%
XP + NP_{OBL} + NP_{NOM}	60	21%
XP + NP_{GEN} + NP_{OBL}	40	14%
XP + NP_{OBL} + NP_{GEN}	3	1%
Total	290	100%

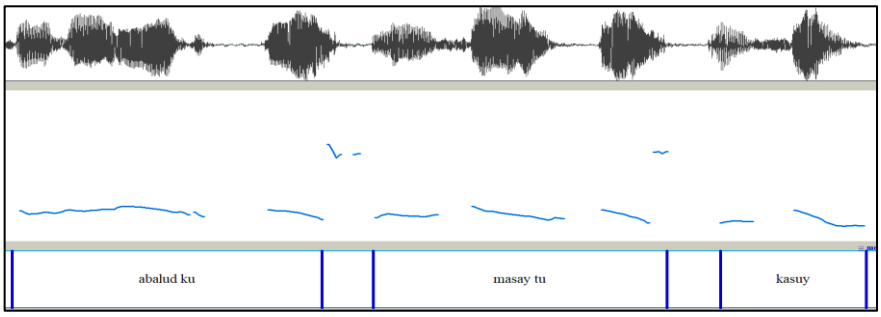
Table 3 presents the distribution of nominative and oblique noun phrases across two word orders: XP + NP_{NOM} + NP_{OBL} and XP + NP_{OBL} + NP_{NOM}. For the XP + NP_{NOM} + NP_{OBL} word order, there are 186 sentences.[3] In this configuration, 55% of the sentences (103 sentences) demonstrate that both case markers are cliticized to the preceding word, as illustrated in (16) and (17).

Table 3: *Distributions of XP + NP_{NOM} + NP_{OBL} and XP + NP_{OBL} + NP_{NOM}*

XP + NP_{NOM} + NP_{OBL}			XP + NP_{OBL} + NP_{NOM}		
NP_1	NP_2		NP_1	NP_2	
KU/CI]	TU]	103	TU]	KU/CI]	30
	[TU	3		[KU/CI	1
	NO	20		NO	11
[KU/CI	TU]	0	[TU	KU/CI]	0
	[TU	0		[KU/CI	0
	NO	0		NO	1
NO	TU]	30	NO	KU/CI]	8
	[TU	4		[KU/CI	0
	NO	26		NO	9
Total		186	Total		60

(16) sabalud ku masay tu kasuy. (From Sakizaya Online Dictionary)
sa-balud ku masay tu kasuy
INS-tie NOM vine OBL wood
'The vine is used to tie wood.'

(17)



Syntax	[[	]$_V$ ku]	[[	]$_N$ tu]	[	]$_N$
Phonology	[[	]$_{PW}$ ku]	[[	]$_{PW}$ tu]$_{PPh}$	[	]$_{PW}$

[3] The sentence in (13) is not included in Table 3 because there are pauses before and after the oblique case marker, *tu*.

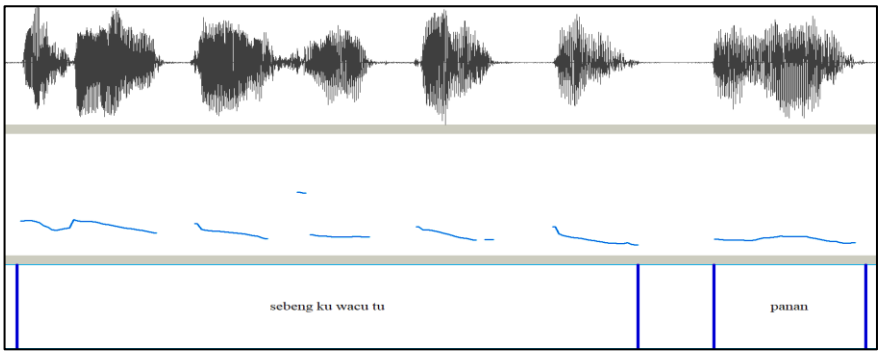
There are 30 sentences with cliticization on the second case marker, 26 sentences without cliticization, and 20 sentences with cliticization on the first case marker. The other two types of demarcation occur less frequently. Additional examples are provided in (18) and (19).

(18) sebeng ku wacu tu panan. (From Sakizaya Online Dictionary)

sebeng	*ku*	*wacu*	*tu*	*panan*
guard	NOM	dog	OBL	entry

'The dog guards the entry.'

(19)



Syntax	[[	]$_{V}$ [		]$_{NP}$	tu]]	[	]$_{N}$
Phonology	[[	]$_{PW}$ [		]$_{PPh}$	tu]]	[	]$_{PW}$

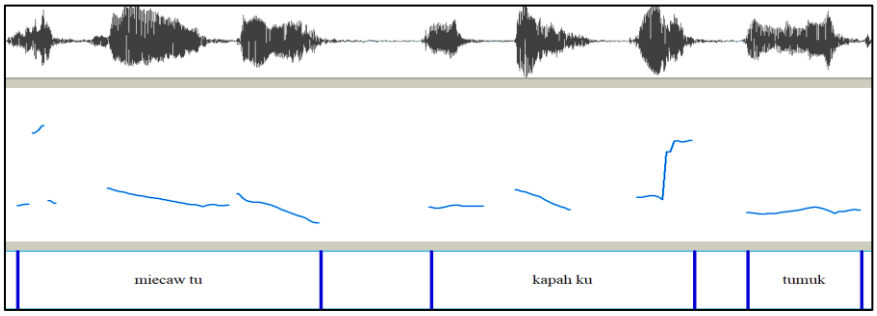
For the XP + NP_{OBL} + NP_{NOM} word order, there are 60 sentences. Half of these (30 sentences) exhibit cliticization on both case markers. The remaining half displays five types of cliticization: 11 sentences with cliticization on the first case marker, 9 sentences without cliticization, and 8 sentences with cliticization on the second case marker. The other two types occur sporadically. An example illustrating cliticization on both case markers for XP + NP_{OBL} + NP_{NOM} is provided in (20) and (21).

(20) miecaw tu kapah ku tumuk. (From Sakizaya Online Dictionary)

mi-ecaw	*tu*	*kapah*	*ku*	*tumuk*
AF-train	OBL	good	NOM	tribe.leader

'The tribe leader trains the younger generation.'

(21)



Syntax	[[	]$_{V}$ tu]	[[	]$_{N}$ ku]	[	]$_{N}$
Phonology	[[	]$_{PW}$ tu]	[[	]$_{PW}$ ku]$_{PPh}$	[	]$_{PW}$

Table 4 presents the distributions of genitive and oblique noun phrases across the word orders: XP + NP_{GEN} + NP_{OBL} and XP + NP_{OBL} + NP_{GEN}. The table includes 43 sentences, with 40 sentences in the XP + NP_{GEN} + NP_{OBL} configuration and only three sentences in the XP + NP_{OBL} + NP_{GEN} configuration. For

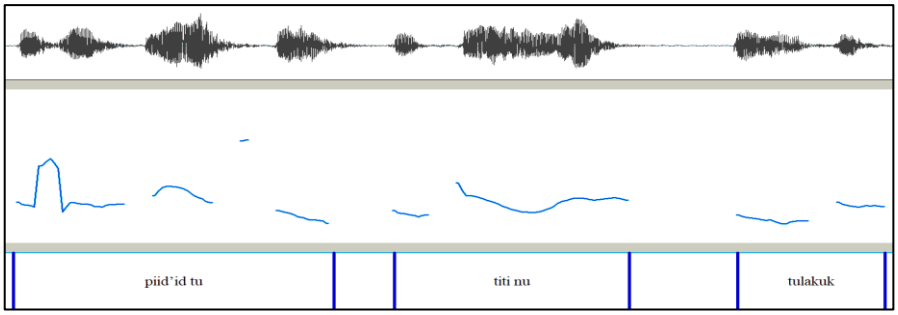
XP + NP_{GEN} + NP_{OBL}, 21 sentences show cliticization of both case markers to the preceding word. Additionally, 7 sentences exhibit cliticization on the first case marker, and 6 sentences show cliticization on the second case marker. An example with cliticization on both case markers is provided in (22) and (23).

Table 4: *Distributions of XP + NP_{GEN} + NP_{OBL} and XP + NP_{OBL} + NP_{GEN}*

XP + NP_{GEN} + NP_{OBL}			XP + NP_{OBL} + NP_{GEN}		
NP_1	NP_2		NP_1	NP_2	
TU]	NU/NI]	21	NU/NI]	TU]	1
	[NU/NI	0		[TU	0
	NO	7		NO	1
[TU	NU/NI]	0	[NU/NI	TU]	0
	[NU/NI	0		[TU	0
	NO	0		NO	0
NO	NU/NI]	6	NO	TU]	0
	[NU/NI	0		[TU	0
	NO	6		NO	1
Total		40	Total		3

(22) piid'id tu titi nu tulakuk. (From Sakizaya Online Dictionary)
piid'id *tu* *titi* *nu* *tulakuk*
roast OBL flesh GEN chicken
'Roast the chicken.'

(23)

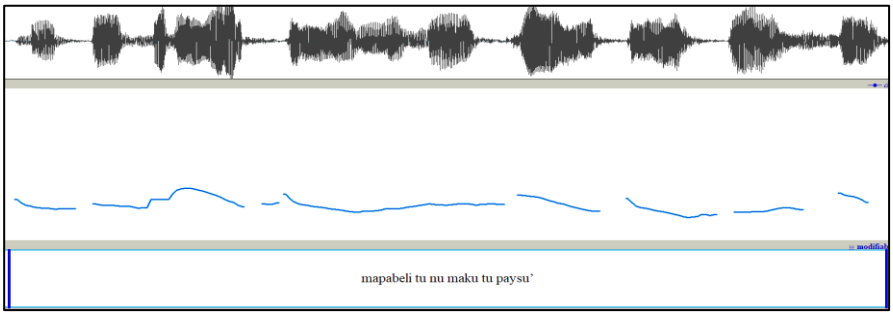


Syntax	[	]$_V$ tu]	[[	]$_N$ nu]	[	]$_N$
Phonology	[	]$_{PW}$ tu]	[[	]$_{PW}$ nu]$_{PPh}$	[	]$_{PW}$

For the XP + NP_{OBL} + NP_{GEN}, there are only three sentences, indicating that this structure is rare in Sakizaya. An example showing no cliticization is provided in (24) and (25).

(24) mapabeli tu nu maku tu paysu'. (From Sakizaya Online Dictionary)
ma-pabeli=tu *nu* *maku* *tu* *paysu'*
PF-pay=PRF GEN 1SG OBL money
'I have paid the money.'

(25)



Syntax	[[	]$_V$	nu	[	]$_N$	tu	[	]$_N$]
Phonology	[[	]$_{PW}$	nu	[	]$_{PW}$	tu	[	]$_{PW}$]

Thus far, I have presented the distributions of the four word order types, along with examples and their phonetic realizations. In the following section, the results of this paper will be compared both internally and with the findings of Lin (2020).

4 Discussion

This section examines the internal differences between the oblique case marker and the other two case markers, followed by a comparison with Lin's (2020) findings to provide a comprehensive overview of case marker cliticization in Sakizaya. As Lin (2020) proposed type difference and distance effect, Table 5 presents a comparison of Lin's (2020) data with the data from this paper to address type difference.

Table 5: *General distributions of the 6 word orders*

NP_1	NP_2	XP + NP_{NOM} + NP_{GEN}	XP + NP_{GEN} + NP_{NOM}	XP + NP_{NOM} + NP_{OBL}	XP + NP_{OBL} + NP_{NOM}	XP + NP_{GEN} + NP_{OBL}	XP + NP_{OBL} + NP_{GEN}
CM]	CM]	205	92	103	30	21	1
CM]	[CM	38	9	3	1	0	0
CM]	NO	101	17	20	11	7	1
[CM	CM]	3	1	0	0	0	0
[CM	[CM	2	2	0	0	0	0
[CM	NO	7	1	0	1	0	0
NO	CM]	45	60	30	8	6	0
NO	[CM	12	7	4	0	0	0
NO	NO	48	50	26	9	6	1
Total		461	239	186	60	40	3

Lin's (2020) analysis of type difference for nominative and genitive noun phrases is based on the calculation of the right demarcation in the first noun phrase: 75% ((205+38+101)/461) for nominative and 49% ((92+9+17)/239) for genitive.

With the inclusion of new data for oblique noun phrases, the type difference is recalculated based on Table 5: 73% for nominative noun phrases (= (205+38+101+103+3+20)/(461+186)), 52% for genitive noun phrases (= (92+9+17+21+7)/(239+40)), 70% for oblique noun phrases (= (30+1+11+1+1)/(60+3)). This indicates a clear type difference in cliticization in Sakizaya. Specifically, nominative and oblique noun phrases in the first position are more likely to undergo cliticization than genitive noun phrases (73% and 70% vs. 52%).

Regarding the distance effect, Lin's (2020: 53) data are reproduced in Table 6 for a general comparison.

Table 6: *Cliticization of nominative and genitive noun phrases*

NP_1 \ NP_2	Right	Left	No	Total
Right	297	47	118	462
Left	4	4	8	16
No	105	19	98	222
Total	406	70	224	700

Lin (2020) suggests a distance effect, indicating that the closer the case markers are to the predicate, the more likely they are to undergo cliticization. Based on the percentage of cliticization when it occurs (shaded areas in Table 5), the results show that 98% of the examples in the first noun phrase undergo cliticization ((297+48)/352) and 86% of the examples in the second noun phrase undergo cliticization ((297+4)/352).

Following Lin's (2020) analysis, the data in Table 3 for nominative and oblique noun phrases can be reinterpreted as shown in Table 7, highlighting cliticization on different edges.

Table 7: *Cliticization of nominative and oblique noun phrases*

NP_1 \ NP_2	Right	Left	No	Total
Right	133	4	31	168
Left	0	0	1	1
No	38	4	35	77
Total	171	8	67	246

In Table 7, it is evident that for both the first and second case markers, right demarcation occurs more frequently than no demarcation, while left demarcation is the least preferred, as also observed in Table 6. The data in Table 7 further indicate that when cliticization occurs in the first case marker, all examples exhibit right demarcation. Similarly, when cliticization occurs in the second case marker, 97% of the examples show right demarcation (133/137).

Second, the data in Table 4 for genitive and oblique noun phrases can be reinterpreted as shown in Table 8, focusing on cliticization at different edges. In Table 8, right demarcation is the only option observed when cliticization occurs (100%, 22/22).

Table 8: *Cliticization of genitive and oblique noun phrases*

NP_1 \ NP_2	Right	Left	No	Total
Right	22	0	8	30
Left	0	0	0	0
No	6	0	7	13
Total	28	0	15	43

Although the data in Tables 7 and 8 for oblique noun phrases do not fully support Lin's (2020) hypothesis of distance effect, we can examine the overall distribution of the data across Tables 6, 7, and 8, as presented in Table 9.

Table 9: *Cliticization of nominative, genitive and oblique noun phrases*

NP_1 \ NP_2	Right	Left	No	Total
Right	452	51	157	660
Left	4	4	9	17
No	149	23	140	312
Total	605	78	306	989

The data in Table 9 reveal that 98% of the examples in the first noun phrase undergo cliticization ((452+51)/511), while 89% of the examples in the second noun phrase exhibit cliticization. This strongly indicates that the distance effect remains present in Sakizaya.

With the confirmation of type difference and distance effect in cliticization, the next step is to explore the potential interaction between the types of case markers and their positions in cliticization. Table 10 summarizes the total number of examples for the three main types of case markers across the two positions (focusing on right demarcation).

Table 10: *Interaction of types of case markers and positions (right demarcation only)*

	NP_1	**NP_2**	**Total**
NOM	470	191	661
GEN	146	254	400
OBL	44	160	204
Total	660	605	1265

A Chi-square test is conducted to determine whether there is a significant difference between the types of case markers and their positions. The chi-square statistic is 210.89, with a *p*-value of < 0.00001, indicating a categorical difference between the two positions. When the interaction is examined, it becomes evident that nominative case markers are more likely to undergo cliticization in the first noun phrase, while genitive and oblique case markers tend to cliticize in the second noun phrase.

Table 11 provides a comprehensive summary of the cliticization patterns observed in two noun phrases in Sakizaya. This table encapsulates the overall distribution of cliticization across the different types of case markers (nominative, genitive, and oblique) and their respective positions within noun phrases.

Table 11: *Summary of type difference and distance effect of cliticization in Sakizaya*

	Case markers	**Type difference**	**Distance effect**
Lin (2020)	NOM vs. GEN	Yes	Yes
This paper	NOM vs. OBL	Yes	Yes
	OBL vs. GEN	No	No
General	NOM vs. GEN vs. OBL	Yes	Yes

5 Conclusion

In conclusion, this paper has explored the cliticization of three types of case markers in Sakizaya by incorporating data on oblique noun phrases. The analysis has expanded the existing corpus with 290 new sentences, bringing a comprehensive set of examples that include different combinations of nominative, genitive, and oblique noun phrases. The results confirm the prevalence of cliticization across these structures, aligning with Lin's (2020) proposals on type difference and distance effect. Specifically, the findings indicate that nominative and oblique case markers are more likely to undergo cliticization compared to genitive case markers, with a notable tendency for cliticization in the first noun phrase rather than the second. Moreover, the interaction between the type and position of case

markers suggests distinct cliticization behaviours, with nominative case markers typically cliticizing in the first noun phrase, while genitive and oblique markers tend to cliticize in the second.

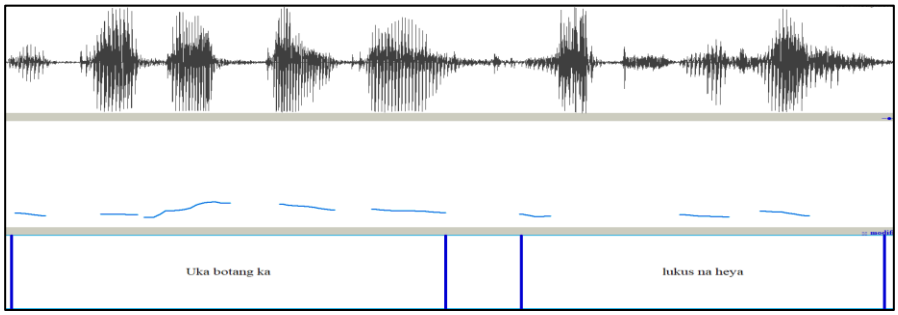
This study advances our understanding of cliticization in Sakizaya and lays the groundwork for research on other Formosan languages that may exhibit similar syntactically-conditioned phonological processes. For instance, Seediq and other languages within the Austronesian family could provide valuable insights into the broader patterns of cliticization, offering a richer perspective on the linguistic structures within these language groups. As shown in (26) and (27), cliticization of the nominative case marker *ka* is also observed to undergo cliticization.

(26) Uka botang ka lukus na heya. (From Seediq Online Dictionary)

Uka	*botang*	*ka*	*lukus*	*na*	*heya*
NEG	button	NOM	cloth	GEN	3SG

'There is no button on his cloth.'

(27)



Syntax	[[	]$_{XP}$	ka	]	[[	]$_{N}$ [	]$_{NP}$]
Phonology	[[	]$_{PPh}$	ka	]	[[	]$_{PW}$ [	]$_{PPh}$]

If other Formosan languages also exhibit cliticization, future studies could extend this investigation, potentially uncovering new dimensions of cliticization that contribute to the overall understanding of Austronesian languages.

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DECOMPOSING THAI WH-WORDS: THE SYNTAX AND SEMANTICS OF WH-MORPHEMES *DAJ*/*RAJ*/*NAJ*

Naparat MEECHANYAKUL
Language Institute, Thammasat University
naparat.m@litu.tu.ac.th

Abstract
This study investigates the syntactic and semantic roles of common *wh*-morphemes, namely *-daj*, *-raj*, and *-năj*, in the formation of *wh*-words in Thai. Previous analyses suggest that the common *wh*-morpheme in Thai is either *-raj* or *-aj*, so *thîinăj* 'where' and *thammaj* 'why' are derived from **thîiraj* and **thamraj* respectively. Those studies, however, did not address the fact that Thai has *-daj* as another *wh*-morpheme and that *-năj* is semantically different from *-raj*. In this study, I propose an alternative view by arguing that the common morphemes of Thai *wh*-words are *-daj* and *-năj*, while *-raj* surfaces as an allomorph of *-daj*. I show that the three morphemes have different properties and that only *-daj* and *-năj* are productive. A formal syntactic analysis shows that *-daj* and *-năj* are demonstratives occupying a D-head and taking a classifier phrase as a complement. Semantically, these *wh*-morphemes denote a set of alternatives. This study contributes to the understanding of Thai *wh*-phrases and of *wh*-words in general. Since Thai *wh*-words can be decomposed into meaningful elements, we can better understand what role the common *wh*-morpheme plays in the syntax and semantics of *wh*-words.

Keywords: wh-words, wh-morphemes, morphology, syntax, semantics
ISO 639-3 codes: tha

1 Introduction

Among languages, systems of *wh*-words often have recurring morphemes or phonological material as sources of derivation for the various words. For example, English has *wh-* as a common morpheme for the *wh*-words, which is realized as *wh-* in written form and as the sound /w/ in spoken form. Such words in Italian have the common sound /k/, which is represented by the letters *ch-* or *q-* in writing. While these common morphemes serve as a signature of *wh*-words in each language, it is still unclear if they have any syntactic or semantic roles in the formation of *wh*-words. These morphemes may not merely represent a uniform class of words but may also have syntactic and semantic effects. This study aims to understand the role of *wh*-morphemes by examining the formation of *wh*-phrases in Thai.

Central Thai (henceforth Thai), a variety that is used in governmental, educational, and media settings in Thailand, also has a common morpheme that represents a group of *wh*-words. The following six basic *wh*-words have been discussed in the literature: *ʔàraj* 'what', *khraj* 'who', *thîinăj* 'where', *mûaraj* 'when', *thammaj* 'why', and *jàaŋraj* 'how'. Previous studies of these words suggest that the common *wh*-morpheme in Thai is either *-raj* (e.g., Warotamasikkhadit 1972; Thiramongkol 1973; Jenny 2019) or the vowel-glide *-aj* (Ruangjaroon 2005).

The analysis that the common *wh*-morpheme is *-raj* is generally agreed by the majority of researchers on the Thai language. According to the analysis, the *wh*-words that do not end with *-raj* namely *thîinăj* 'where' and *thammaj* 'why' are derived from **thîi-raj* and **tham-raj* respectively. Although this analysis is promising, a few issues are in order. First, what would be the process that changes *-raj* to *-năj* on the one hand, but to *-maj* on the other hand? Second, why did the change take place only for these two words (*thîinăj* and *thammaj*) but not for the rest of the *wh*-words? Upon closer scrutiny, *-raj* does not seem to be the source morpheme of *-năj*. For one thing, *-raj* and *-năj* are in fact distinctive in terms of their semantics: *-năj* encodes specificity, while *-raj* is not.

One fact about Thai *wh*-phrases that is not addressed by previous studies is the existence of the *wh*-morpheme *-daj*. Although the morpheme sounds archaic in contemporary spoken Thai, it is still used extensively in written language, for instance, social media postings. It also appears in formal documents such as governmental statements, exam papers, and essays. When we take into account the existence of the morpheme *-daj*, we now have three *wh*-morphemes in consideration namely *-daj*, *-raj*, and *-năj*. This set of *wh*-morphemes prompts us to ask the following research questions:

- How are the three morphemes *-daj*, *-raj*, and *-năj* syntactically and semantically different?
- What syntactic and semantic roles do these morphemes contribute to the formation of Thai *wh*-words?

This paper is organized as follows. In section 2, the six Thai *wh*-words are decomposed to examine what types of words are involved in their formation. Section 3 discusses the differences between the morphemes *-daj* and *-raj* on the one hand and between the morphemes *-daj/-raj* and *-năj* on the other hand. Section 4 proposes an alternative analysis that argues that *-daj* and *-năj* are the two common *wh*-morphemes in Thai. The *raj*-ending phrases surface as a result of phonetic change and/or morphological blending; thus, they are lexical items. The *daj*- and *năj*-ending phrases, on the other hand, remain complex syntactic objects. Under a generative framework, I propose, in section 5, an analysis for the *daj*- and *năj*-ending phrases which shows that *-daj* and *-năj* are demonstratives and have a syntactic role in the formation of Thai *wh*-phrases. Semantically, these morphemes denote a set of alternatives. Section 6 concludes and addresses the contributions of the study.

2 Decomposing Thai *wh*-words

Researchers on the Thai language propose that Thai *wh*-words *ʔàraj* 'what', *khraj* 'who', *thîinăj* 'where', *mûaraj* 'when', *thammaj* 'why', and *jàaŋraj* 'how' are decomposable (e.g., Thiramongkol 1973; Jenny 2019). Each *wh*-word constitutes a content word and an ending stem, as illustrated in Table 1. The content words bear the core meaning of *wh*-words which corresponds to their functions. For example, *ʔàraj* 'what' that is used to ask for (in)animate non-human entities has the word *ʔan* meaning 'thing' as its content word as exemplified in (1). In other words, the content words identify what types of information that each *wh*-word is asking for.

(1) *Pim lûak ʔan níi*
Pim choose thing this
'Pim chooses this thing/one.'

The ending stems we see here in the table are *-raj*, *-năj*, and *-maj*. As discussed earlier, *-năj* does not seem to be an allomorph of *-raj* due to their semantic differences, which is also signaled by different tones (i.e., *-năj* bears a rising contour tone whereas *-raj* and *-maj* do not). As for *-maj*, it may be derived either from *-raj* or *-daj*, which will be discussed below. I call these ending stems "*wh*-morphemes" since they function similarly to common *wh*-morphemes in other languages (e.g., *wh-* in English). In Thai, these *wh*-morphemes do not display any mismatch in form and sound.

Table 1: *Morphological decomposition of Thai wh-words*

***wh*-words**	**meaning**	**content words**	**meaning**	**ending stems**
ʔàraj	what	*ʔan*	thing	*raj*
khraj	who	*khon*	person	*raj*
thîinăj	where	*thîi*	place	*năj*
mûaraj	when	*mûa*	time	*raj*
thammaj	why	*tham*	do	*maj*
jàaŋraj	how	*jàaŋ*	manner	*raj*

Another *wh*-morpheme in Thai is *-daj*. While it does not appear in the six basic *wh*-words in Table 1, it can be combined with all the content words, rendering the same meaning as the *raj*-ending words. The *daj*-ending counterparts are shown in (2).

(2) Thai *wh*-words ending with *-daj*
a. *ʔan-daj* 'what'
b. *khon-daj* 'who'
c. *thîi-daj* 'where'
d. *mûa-daj* 'when'
e. *? tham-daj* 'why'
f. *jàaŋ-daj* 'how'

As marked by the question mark (?) in (2e), *thammaj* 'why' is special in that it is unclear whether *-raj* or *-daj* is the source form. Neither **tham-raj* nor **tham-daj* are attested nor meaningful in contemporary Thai, so it is not possible to justify its original form based on these synchronic forms alone. However, as the discussion becomes clear, I hypothesize that **tham-daj* is the original form of *thammaj* 'why'.

Another aspect of *thammaj* 'why' that is worth discussing concerns the content word source morpheme. As shown in Table 1, the content word element of *thammaj* 'why' is the verb *tham* 'do'. It is somehow hard to see the connection between the meaning 'do' and the fact that it is a part of the *wh*-word that asks for reasons. While I do not attempt to tackle this puzzle in this study, I would like to provide an observation that in the Northern Thai variety, the word for 'why' is *jáʔ-jǎŋ* where *jáʔ* also means 'do'.

In this section, I have dissected Thai *wh*-words and established that Thai has three *wh*-morphemes namely *-daj*, *-raj*, and *-nǎj* that end each *wh*-word. In the next section, I will discuss the properties of these morphemes and show how they are similar and different from one another.

3 Properties of *-daj, -raj,* and *-nǎj*

Two distinctions will be discussed in this section. In section 3.1, I discuss in what ways that *-nǎj* is different from *-daj* and *-raj*. In section 3.2, I show how *-nǎj* and *-daj* is different from *-raj*.

3.1 -nǎj vs. -daj/-raj

-nǎj has two characteristics that are not shared by *-daj/-raj*. First, under the condition that there is a prior contextual conversation, *-nǎj* can be used as a stand-alone question word (see also Thiramongkol 1973 and Thamniam et al. 2013). In (3), there is contextual information available such that Pim told Som that the package they had been waiting for had just been delivered. Som did not see the package, so she asked *nǎj* 'Where?'. Crucially, an out-of-the-blue utterance of *nǎj* would be ungrammatical and pragmatically infelicitous.

(3) *-nǎj* as a stand-alone question word
Pim said: The package was just delivered!
Som asked: *nǎj*
where
'Where (is it)?'

Second, *-nǎj* can appear with some stative and motion verbs without having to be mediated by a classifier, as shown in (4).

(4) *-nǎj* with stative/motion verbs and optional classifiers
Pim *[$_{VP}$ jùu / paj / maa-càak]* *(thîi / troŋ)* *nǎj*
Pim be / go / come-from CLF where
'Where is Pim?'; 'Where did Pim go?'; 'Where did Pim come from?'

-daj and *-raj* do not have these properties. (5a) shows that it is not possible for *-daj* and *-raj* to be stand-alone question words. The contrast between (5b) and (5c) shows that a classifier is needed for the morpheme *-daj* to form a legitimate *wh*-phrase. When the classifier is absent, the sentence is ungrammatical. Notice that the ungrammaticality in (5a) and (5c) can be rescued by having a classifier, so for (5a), it is possible to ask *ʔan-daj* or *ʔàraj* in the situation.

(5) *-daj/-raj* cannot be used as stand-alone question words, and a classifier is needed.

a. Pim said: Something is in front of our house!
   Som asked: **daj / *raj*
   Intended: 'What (is it)?'
b. *Pim* *jùu* *thîi-daj*
   Pim be CLF-WH
   'Where is Pim?'
c. **Pim* *jùu* *daj*
   Pim be WH

The unique properties of *-năj* discussed thus far suggest that inherent in the meaning of *-năj* is location/spatial information so that the morpheme itself can be used as a question word asking for location and can appear with some stative and motion verbs with optional classifiers. The fact that *-daj* and *-raj* cannot occur alone without a classifier tells us that the morphemes do not have an inherent meaning in the same way as *-năj* has. However, it does not suggest that the morphemes do not contribute to the semantics of *wh*-words. This will be discussed in section 5.

3.1 -năj/-daj vs. -raj

While *-daj* is different from *-năj* in some respects, they are also similar to each other in some ways, and this makes the two morphemes distinct from *-raj*. First, both *-daj* and *-năj* are productive morphemes. They can be combined with any nouns to derive a *wh*-phrase, with the presence of a classifier, as exemplified in (6a-b).

(6) *-daj* and *-năj* are productive *wh*-morphemes.

a. *bâan* *lăŋ* *daj / năj*
   house CLF WH
   'What/which house?'
b. *kràpăw* *baj* *daj / năj*
   bag CLF WH
   'What/which bag?'

-raj is not productive. As shown in (7a-b), the morphological composition of the morpheme *-raj* with nouns and classifiers is ungrammatical.

(7) Ungrammaticality with the *raj*-ending phrases

a. ** bâan* *lăŋ* *raj*
   house CLF WH
   Intended: 'What house?'
b. ** kràpăw* *baj* *raj*
   bag CLF WH
   Intended: 'What bag?'

Note that the ungrammaticality observed in (7) should not be confused with *ʔàraj* contraction. In modern spoken Thai, *ʔàraj* is normally shortened to *raj*. In that case, the utterance ending with *raj* as

shown in (8) is in fact a shortened form of *ʔàraj* 'what' and cannot be taken to be an instance of the ending stem *-raj*.

(8) *ʔàraj* contraction

bâan	*raj*	→	*bâan*	*ʔàraj*
house	what		house	what

'What house?'

The second property that *-daj* and *-năj* share to a certain extent is their ability to form D(iscourse)-linked *wh*-phrases. As its name suggests, D-linked *wh*-phrases are *wh*-phrases that refer to an existing set of entities available in the discourse. The set of entities serves as a common ground in a conversational situation; thus, both the speaker and the hearer share the knowledge of the set. When the D-linked *wh*-phrases are uttered, an expected answer is to be drawn from the set. For example, suppose that A as a speaker, and B as a hearer are both aware of ten books/materials from which Pim can select for her reading. A would like to know what Pim selected for reading, so A asked B the question in (9). *sìŋ-năj* or *lêm-năj* are D-linked *wh*-phrases that refer to the list of ten books/materials that both A and B share the knowledge of. The question in (9), thus, is syntactically grammatical and pragmatically appropriate for the situation.

(9) *-năj* in D-linked *wh*-phrase

Pim	*ʔàan*	*sìŋ / lêm*	*năj*
Pim	read	CLF	WH

'Which one/book did Pim read?'

-daj seems to share this property with *-năj* in that, sometimes, *daj*-ending phrases can be interpreted as D-linked *wh*-questions. So, for the same context described for (9), the sentence (10) is also grammatical and pragmatically felicitous.

(10) *-daj* as D-linked *wh*-phrase

Pim	*ʔàan*	*sìŋ / lêm*	*daj*
Pim	read	CLF	WH

'Which one/book did Pim read?'

Nevertheless, *daj*-ending phrases can also be used as a non-D-linked *wh*-phrase. When contextual information is not available or when A and B do not share the common ground, asking with *daj*-ending phrases is pragmatically more felicitous than asking with *năj*-ending phrases, as shown by the contrast between (11a) and (11b). In (11a), the speaker only knows that Pim has bought something, but s/he does not know or see what those things are. In (11b), on the contrary, the speaker already knows and sees the list of things that have been bought, but s/he wants to know the specific items that Pim, and not someone else, bought. Hence, specificity is encoded in the morpheme *-năj* whereas it might not be or weakly encoded in the morpheme *-daj*.

(11) *-daj* can form non-D-linked *wh*-phrases

a. *Pim súuu sìŋ-daj maa*
   Pim buy CLF-WH come
   'What did Pim buy?'

b. *Pim súuu sìŋ- năj maa*
   Pim buy CLF-WH come
   'Which thing did Pim buy?'

In this section, I have discussed the distinctions and similarities of the three *wh*-morphemes. The discussion in this section shows that *-raj* is not productive and the morpheme is attested only in the following *wh*-words: *ʔàraj* 'what', *khraj* 'who', *mûaraj* 'when', and *jàaŋraj* 'how'. *-daj* and *-năj*, on the other hand, are productive morphemes that can form a *wh*-phrase with any noun or classifier. The morpheme *-năj* has an inherent meaning denoting location; hence, it can be used as a stand-alone question word in a discourse context. The morpheme *-năj* can form D-linked *wh*-phrases since it denotes specificity, which is necessary for delivering the meaning of D-linked *wh*-phrases. The morpheme *-daj* can be interpreted as both D-linked and non-D-linked *wh*-phrases, depending on the conversational situation.

4 An alternative view on the common *wh*-morpheme in Thai

Based on the characteristics and the distributions of the three morphemes described thus far, I propose an alternative view by arguing that the common *wh*-morphemes in Thai are *-daj* and *-năj*. The morpheme *-raj* surfaces as an allomorph of *-daj* through phonetic change and/or morphological blending. As a result, *raj*-ending phrases become lexical items whereas *daj-* and *năj*-ending phrases remain complex syntactic objects.

Table 2 illustrates the changing process of Thai *wh*-words. I propose that all the *raj*-ending phrases are derived from *daj*-ending phrases. The morpheme *-daj* is composed with a noun/classifier deriving the *wh*-phrases *ʔan-daj* 'what', *khon-daj* 'who', *mûa-daj* 'when', and *jàaŋ-daj* 'how'. The change could first be phonetic in that the vowel-glide [aj] conditions the change from [d] to [r]. After that, the *raj*-phrases undergo morphological blending, giving rise to the current form as shown in the last column of table 2. The *wh*-word *thîi-năj* 'where' retains its original form; that is, its source derivational material is the morpheme *-năj*, and not the morpheme *-daj*. As briefly mentioned in section 2, I hypothesize that *tham-daj* is the original form of *thammaj* 'why'. The change could be purely phonetic in that the dental plosive [d] underwent progressive assimilation, becoming the bilabial nasal [m] and giving rise to the current form *thammaj*.

Table 2: *Morphological derivation of Thai wh-words*

Meaning	**Phonetic Change/ Morphological Blending**			**Current Form**
What	*ʔan-daj*	→	*ʔan-raj*	*ʔàraj*
Who	*khon-daj*	→	*khon-raj*	*khraj*
When	*mûa-daj*	→	*mûa-raj*	*mûa-raj*
How	*jàaŋ-daj*	→	*jàaŋ-raj*	*jàaŋ-raj*
Where	*thîi-năj*	→	-	*thîi-năj*
Why	*tham-daj*	→	-	*tham-maj*

Based on the derivation discussed, I further propose that the current forms in Table 2 are lexical items that belong to the lexical categories shown in (12). *ʔàraj* 'what' and *khraj* 'who' are nouns because the content words are *ʔan* 'thing' and *khon* 'person' are nouns. The words *mûa* 'when' and *jàaŋ* 'manner' are adverbs, so *mûaraj* and *jàaŋraj* are also adverbs. Only *thammaj* 'why' has a mismatch in the category of the content word and the derived *wh*-word in that the word *tham* 'do' is a verb, while *thammaj* 'why' should belong to the adverb category. The categorization is crucial for understanding the behavior of these *wh*-words when they appear in a clausal structure, which should be explored in future studies.

(12) Lexical categories of *raj*-ending phrases

	***Wh*-lexical item**	**Meaning**	**Category**
a.	*ʔàraj*	what	Noun
b.	*khraj*	who	Noun
c.	*mûaraj*	when	Adverb
d.	*thammaj*	why	Adverb
e.	*jàaŋraj*	how	Adverb

In this section, I have proposed that *-daj* is the original morpheme of *-raj* and that these two morphemes are allomorphs. While *raj*-ending items have undergone some phonetic changes, *năj*-ending phrases retain their original formation. Also, whereas *raj*-ending phrases become lexical items, *daj-* and *năj-*ending phrases remain complex syntactic objects. In the next section, I propose a formal analysis of the syntax and semantics roles of these *wh*-morphemes.

5 On the syntax and semantics of *wh*-morphemes: a formal analysis

As we have seen in the previous discussion, the morpheme *-daj* and *-năj* constitute *wh*-phrases as complex syntactic objects. In this section, I propose that *-daj* and *-năj* are demonstratives that occupy a D° and take classifier phrases as their complements. The morphemes also contribute to the semantics of *wh*-phrases by denoting a set of alternatives. This section is divided into two parts. Section 5.1 provides a syntactic analysis of the position and distribution of the morphemes and discusses a few evidence showing that *-daj* and *-năj* are heads of a DP. Section 5.2 discusses the semantics of the morphemes and the role of classifiers.

5.1 The syntax of the wh-morphemes -daj and -năj

It is necessary to first identify what type of word the *wh*-morphemes *-daj* and *-năj* are. Jenks (2011:128) classifies *năj* as a demonstrative that forms a natural class with deictic modifiers such as *níi* 'this' and *nán* 'that' in terms of syntactic distribution. I follow Jenks in this respect and propose that *-daj* is also a demonstrative. As will also be discussed, these morphemes are in complementary distribution with other demonstratives (i.e., *níi* 'this' and *nán* 'that'), suggesting that they belong to the same category and share the same syntactic position.

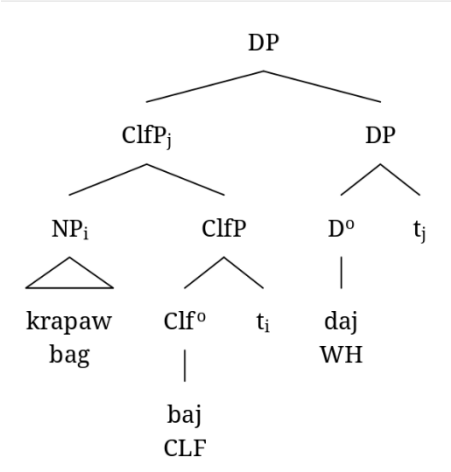
5.1.1 Previous analyses on the syntax of Thai demonstratives

There are two lines of analysis on the syntactic status of Thai demonstratives which I call, following Jenks (2011:132), the Demonstratives as Heads analysis and the Demonstratives as Adjuncts analysis. The Demonstratives as Heads analysis posits that Thai demonstratives occupy the head of a functional projection DP (e.g., Singhapreecha 2001; Simpson 2008; Piriyawiboon 2010; Chaiphet 2023). As depicted in (13), *-daj* occupies the D° which takes the classifier phrase (ClfP) as its complement. The ClfP takes an NP as its complement. The correct word order of the *wh*-phrase *kràpăw baj daj* is derived in two steps. The first step is the movement of the NP *kràpăw* 'bag' to [Spec, ClfP] where the path of movement is represented by the index *i*. The second step is the movement of the whole ClfP to [Spec, DP]; the path of movement is represented by the index *j*.

(13) The Demonstratives as Heads analysis (adapted from Jenks 2011:132)

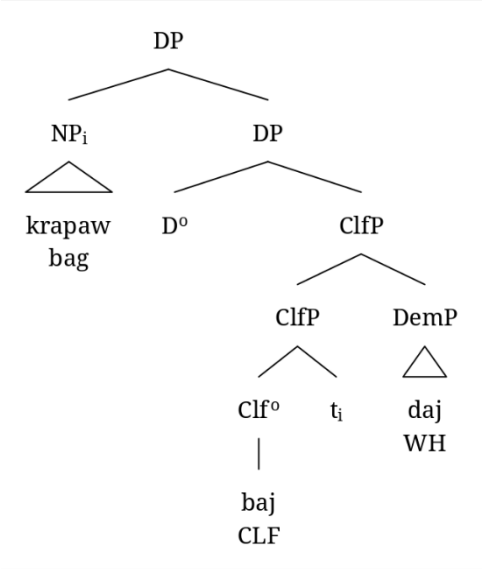
kràpăw	*baj*	*daj*
bag	CLF	WH

'What bag?'



The Demonstratives as Adjuncts analysis provides an alternative view on the status of the demonstratives in Thai. Under this view, the demonstratives are adjuncts that merge to the right of a ClfP as illustrated in (14). In this structure, only the movement of the NP to [Spec, DP] is involved to derive the correct word order.

(14) The Demonstratives as Adjuncts analysis (adapted from Jenks 2011:132)
kràpăw *baj* *daj*
bag CLF WH
'What bag?'



Several arguments have been made to support one analysis over the other. One of the arguments for the adjunct analysis is based on the parallel distribution of adjectives and demonstratives in classifier languages (Jenks, 2011). In Thai, adjuncts typically attach to the right of a constituent. Thai adjectives and demonstratives both appear to the right of an NP as shown in (15). Since adjectives are adjuncts, demonstratives could be analyzed as adjuncts too.

(15) The distributions of adjectives and demonstratives in Thai
a. *kràpăw* *(baj)* *jàj*
bag CLF big
'A big bag'
b. *kràpăw* **(baj)* *daj*
bag CLF WH
'What bag?'

One important difference between the adjective and the demonstrative observed in (15) is the optionality of the classifier. The classifier is optional when the adjective modifies the noun in (15a), but it must be present when the demonstrative, here the *wh*-morpheme, modifies the noun, as in (15b). This close relationship of the *wh*-morpheme and the classifier seems to reflect a head-complement relationship, rather than simply being a modifier (i.e., an adjunct). In the next section, I show that the *wh*-morphemes and classifiers form constituency and that they license noun ellipsis. I will also show that the *wh*-morphemes cannot co-occur with other demonstratives. These characteristics provide evidence in favor of the Demonstratives as Heads analysis.

5.1.2 Constituency and co-occurrence

To confirm that the *wh*-morphemes form constituency with classifiers, I use a coordinate structure as a test. The constituency is further confirmed by the fact that the *wh*-classifier constituents can license noun ellipsis and can be topicalized.

It is the case that only constituents of the same or similar category can be coordinated, as shown in (16).

(16) [$_{DP}$ The teacher] and [$_{DP}$ his friends] visited Chiang Mai last weekend.

The two *wh*-DPs in Thai can also be coordinated as shown in (17).

(17) The coordination of *wh*-DPs

Pim	*súɯ*	*[$_{DP}$ tóʔ*	*tua*	*daj/năj]*	*léɛ*	*[$_{DP}$ năŋsŭɯ*	*lêm*	*daj/năj]*
Pim	buy	table	CLF	WH	and	book	CLF	WH

'What table and what book did Pim buy?'

'Which table and which book did Pim buy?'

It is not possible to coordinate the noun and classifier to the exclusion of the *wh*-morphemes as shown by the ungrammaticality of (18a). We would expect (18a) to be grammatical if the *wh*-morphemes were truly adjuncts. In (18b), the bare noun and the *wh*-DP can coordinate but with the following interpretation: Pim already bought a table, and the speaker wants to know what/which book Pim also bought besides the table. The fact in (18b) further suggests that the *wh*-morphemes must form a constituency with the classifiers, and they only take scope over the NP in its constituent. That is, the interpretation in (17) is not available for (18b).

(18) The *wh*-morphemes do not modify both conjuncts at the same time

a. **Pim súɯ [$_{ClfP}$ tóʔ tua] léɛ [$_{ClfP}$ năŋsŭɯ lêm] daj/năj*
   Pim buy table CLF and book CLF WH
   Intended: 'What/which table and what/which book did Pim buy?'

b. *Pim súɯ [$_{NP}$ tóʔ] léɛ [$_{DP}$ năŋsŭɯ lêm daj/năj]*
   Pim buy table and book CLF WH
   'What/which book x such that Pim bought the table and the book x?'

Jenks (2011) and Chaiphet (2023) discuss the fact that classifier phrases can license noun ellipses. As presented in (19), the NP *sàmùt* 'notebook' can be omitted in the answer as long as the classifier phrase is present. The answer is ungrammatical if the classifier is absent.

(19) Noun ellipsis is licensed by a classifier phrase

Q: *khun-khruu mii sàmùt jɤ́ʔ máj*
   teacher have notebook many Q$_{[Y/N]}$
   'Does the teacher have many notebooks?'

A: *mâj jɤ́ʔ mii sɔ̌ɔŋ lêm*
   NEG many have two CLF
   Lit: 'Not many, she has only two.'

A: **mâj jɤ́ʔ mii sɔ̌ɔŋ*
   NEG many have two

Since the classifier and the *wh*-morpheme form a constituent, it should be able to license an elided noun as well. This is indeed the case as shown in (20b). (20a) provides the context that Pim bought a table from Jane who sold it. The follow-up question in (20b) is grammatical even if the noun is omitted. It is not possible to use only the *wh*-morphemes for the intended meaning 'Which one?' as in (20c). Note

that *năj* can appear alone but with the intended meaning 'Where (is it)?'. When *-năj* is used as a D-linked *wh*-morpheme, it cannot occur alone without a classifier.

(20) Noun ellipsis is licensed by the classifier phrase

a. *Pim* *súuu* *tó?* *tua* *thîi* *Jane* *khăaj*
Pim buy table CLF REL Jane sell
'Pim bought a table which Jane sold.'

b. *tua* *daj/năj*
CLF WH
'Which one?'

c. * *daj/năj*
WH
Intended: 'Which one?'

The fact that *-daj* and *-năj* cannot appear alone seems to support the idea that it is the head of a functional phrase that needs a classifier as its complement. This behavior is parallel to determiners and demonstratives in some languages like English in that these elements, too, cannot occur alone without the nouns as exemplified in (21). These elements occupy the D°, so we can analyze the *wh*-morphemes *-daj* and *-năj* in Thai in the same way. Since Thai is a classifier language, a DP selects a ClfP as its complement, instead of an NP.

(21) Determiners and demonstratives in English

a. The bag is over there.
b. *The is over there.
c. Which bag belongs to Jane?
d. *Which belongs to Jane?

To further support the fact that Thai *wh*-morphemes occupy the D°, we can further examine whether or not they can occur with some other demonstratives in the same category. The logic is that if all the demonstratives in Thai indeed occupy the D°, they should not be able to co-occur since they all occupy the same position in the syntax.

As shown by the data in (22), as expected, the *wh*-morphemes cannot co-occur with other deictic modifiers such as *níi* 'this'. The ungrammaticality in (22a) suggests that *níi* 'this' and the *wh*-morphemes are competing for the same D°, so the co-occurrence is simply not possible. (22b) shows that *níi* 'this' is not an adjunct because if it were, it should be able to modify the bare noun in the same way as the adjective does in (22c). The data in (22b) and (22c) further confirm that *níi* 'this' occupies the D° and it competes for the same syntactic position with the *wh*-morphemes.

(22) Co-occurrence with other demonstratives

a. *Pim *súuu* *kràpăw* *baj* *daj/năj* *níi*
Pim buy bag CLF WH this

b. *Pim *súuu* *kràpăw* *níi* *baj* *daj/năj*
Pim buy bag this CLF WH

c. *Pim* *súuu* *kràpăw* *màj* *baj* *daj/năj*
Pim buy bag new CLF WH
'What/which new bag did Pim buy?'

Jenks (2011) proposes that the impossibility for two demonstratives to co-occur can be explained based on semantic grounds. When both elements co-occur, here the *wh*-morphemes and *níi* 'this', for instance, they "refer to some position an object holds in some ordered space or time" (p. 133) – causing a semantic conflict, hence, uninterpretability. Under the assumption that narrow syntax contains all information that will be transferred to LF and PF, we may explain this semantic conflict that has a syntactic origin.

The D° is generally a position that is crucial for the interpretation of an NP. Demonstratives are interpreted in this position; therefore, two demonstratives cannot occupy the position at the same time. The violation surfaces as ungrammaticality and uninterpretability, as observed in (22).

In this section, I have discussed evidence showing that the *wh*-morphemes *-daj* and *-năj* form constituency with classifiers, and thus, they should be analyzed as heads of a DP. The discussion is in favor of the Demonstratives as Heads analysis. In the next section, I will discuss the semantic aspect of the *wh*-morphemes.

5.2 The semantics of the wh-morphemes -daj and -năj

Although the *wh*-morphemes *-daj* and *-năj* cannot occur alone, it does not mean that they do not contribute to the semantics of *wh*-phrases. When we compare a noun that is modified by indexicals such as *níi* 'this' or *nán* 'that' with the one by the *wh*-morphemes, previous assumptions about that noun must be changed. In (23a) with the indexicals, the sentence conveys the meaning that there exists a beautiful house that is closer or farther from the speaker. In (23b) with the *wh*-morphemes, the sentence has a meaning that there exists a list of houses, familiar or unfamiliar to the speaker, and an expected answer is to be chosen from this list.

(23) Comparing phrases with indexicals and *wh*-morphemes

a. *bâan* *lăŋ* *níi / nán* *sŭaj*
house CLF this / that beautiful
'This/that house is beautiful.'

b. *bâan* *lăŋ* *daj / năj* *sŭaj*
house CLF WH beautiful
'What/which house is beautiful?'

The perspective introduced by (23b) aligns with the idea that *wh*-words denote a set of alternatives in the sense of Hamblin (1973) and Rooth (1992). Since (23a-b) are different only in the choice of demonstratives, we can conclude that the *wh*-morphemes *-daj* and *-năj* change the semantics of (23a) from a singleton to a set of alternatives in (23b). Therefore, the source of the semantics of *wh*-words as a set of alternatives is the *wh*-morphemes. When *-daj* and *-năj* are composed of a noun/classifier, it introduces a set of possible alternatives or answers based on the noun/classifier that they are combined with, deriving the denotation of *wh*-phrases.

The fact that the *wh*-morphemes contribute to the semantics of *wh*-phrases also explains why the morphemes are always needed to form a constituency with classifiers. In addition to syntactic reason, the close relationship between the *wh*-morphemes and the classifiers also has semantic reason. Nouns in Thai are bare nouns. According to Jenks (2011:130), Thai bare nouns are kind, and the role of classifiers is to make deictic modifiers accessible to individuals in the kind domain. Likewise, *-daj* and *-năj* need classifiers to access individuals in the domain to turn them into a set of alternatives.

In this section, I have discussed how *wh*-morphemes in Thai have their place in both syntax and semantics. In syntax, they occupy a D° of a functional phrase DP. They form a *wh*-phrase as a complex syntactic object with a noun/classifier. In this position, they affect the interpretation of a noun/classifier they are composing with. The *wh*-morphemes denote a set of alternatives, and their denotation ranges over the noun/classifier.

Based on the analysis discussed in this section, I further propose that the *raj*-ending phrases which have become lexical items retain the semantics of the complex *wh*-DPs. The content words (see Table 1) are generic, so the meanings of *raj*-ending phrases are also generic. Thus, they are always used as non-D-linked *wh*-words, except for *thîinăj* 'where', which is inherently D-linked. *Daj*-ending phrases are weaker in the degree of specificity, compared to *năj*-ending phrases. Therefore, the *daj*-ending phrases can sometimes be interpreted as non-D-linked and sometimes as D-linked *wh*-phrases, depending on conversational contexts.

6 Conclusion

This article has investigated the role of *wh*-morphemes through Thai *wh*-words. I started with decomposing the six basic Thai *wh*-words ending with *-raj, -năj,* and *-maj*. By taking into account the existence of another *wh*-morpheme *-daj*, I examined how the three morphemes *-daj, -raj,* and *-năj* are different from one another. I argued that the common *wh*-morphemes in Thai are *-daj* and *-năj*, while *-raj* surfaces as an allomorph of *-daj* through phonetic change and/or morphological blending. The processes enable *raj*-ending phrases to become lexical items whereas *daj*- and *năj*-ending phrases remain complex syntactic objects. Through the complex *wh*-objects, I provided a syntactic and semantic analysis of the *wh*-morphemes in Thai by proposing that the *wh*-morphemes are the head of a DP, and they form a constituent with a ClfP. The semantics of the *wh*-morphemes are that of a set of alternatives.

In addition to a better understanding of Thai *wh*-phrases, this study contributes to the understanding of *wh*-phrases in general. Thai *wh*-phrases can be decomposed into meaningful elements, which provide an insight into the internal syntax and the source of the semantics of *wh*-words. Through Thai *wh*-phrases, we can understand better what roles the common *wh*-morphemes play in the syntax and semantics of *wh*-words.

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MIRATIVITY IN ILOCANO, ITAWIS, AND KARAO

Benito Vargas NOLASCO, Jr.
University of the Philippines Diliman/Miriam College Loyola Heights
nbenito29@gmail.com

Abstract
Delancey (1997 and 2001) and Aikhenvald (2012) defined mirativity as a grammatical marking that expresses new and unexpected information and surprise. Previous grammatical descriptions of Ilocano (ISO 639-3: ilo), Itawis (ISO 639-3: itv), and Karao (ISO 639-3; kyj) have focused only on the syntactic functions of expressions that convey mirative meanings. Using spoken and written data, this article aims to (i) determine the criteria for describing mirativity in Ilocano, Itawis, and Karao and (ii) explain the relationship between and among the range of meanings expressed by mirative markers *gayam* (in Ilocano and Karao) and *balattan* (in Itawis) based on a typological framework. The two cross-linguistic mirative notions (i.e., realization and new information) are the primary mirative attitudes expressed in both propositional and illocutionary mirativity in these languages. In propositional mirativity, these primary attitudes may be expressed simultaneously by the speaker along with other attitudes, responses, or conditions including surprise, counter expectation, and expectation met. In illocutionary mirativity, these attitudes function as conversation updates (e.g., narrative, interrogative, and imperative utterances).

Keywords: mirativity, semantics, typology, language description, Philippine Northern Luzon languages
ISO 639-3 codes: ilo, itv, kyj

1 Typological definitions and expressions of mirativity

Typological studies[1] have laid out significant notions of mirativity since Delancey coined it in 1997. Delancey (1997 and 2001) defined mirativity as information that is novel to the speaker and has an overtone of surprise. Prior to his works on mirativity, notions on new or unexpected information and surprise were analyzed under other linguistic categories, such as evidentiality[2] and exclamatives. Aside from Delancey, Aikhenvald (2012) provided cross-linguistic values of mirativity including (i) sudden discovery, revelation, or realization; (ii) surprise; (iii) an unprepared mind; (iv) counter expectation; and (v) new information to the speaker, addressee, or main character. Delancey's (1997, 2001) definition and Aikhenvald's (2012) proposed values of mirativity provide two intersecting notions – new information and surprise. They also agree that these meanings or values in a proposition reflect the overall knowledge[3] of the speaker. Hengeveld and Olbertz (2012) corroborate this, arguing that

1 List of abbreviations and symbols: -, morpheme separator; < >, infix; =, clitic boundary; ~, reduplication; 1, first person; 2, second person; ABIL, Abilitative; ABS, absolutive; ADJF, adjective-forming; APP, applicative; AUX, auxiliary; CONT, continuous; DEL, deliberative; DIS, distal; ERG, ergative; EXIST, existential; FUT, future; IMPF, imperfective; IMPV, imperative; INCL, inclusive; INT, intransitive; INTER, interrogative; IRR, irrealis; J, noun class in Chechen; LKR, linker; MIR, mirative; NEG, negative; NMLR, nominalizer; NOM, nominative; NPER, non-personal; NSP, non-specified subject pronoun; OBL, oblique; PAR, particle; PER, personal; PFV, perfective; PL, plural; POL, polite; POSS, possessive; R, realis; RECPST, recent past; RECWITPST, recent witnessed past; SG, singular; STAT, stative; TOP, topic; TRA, transitive

2 Linguistic studies prior to Delancey (2001), grammatical descriptions analyzed grammatical elements with mirative meanings as admirative expressions.

3 Delancey (1997; 2001) and Aikhenvald (2012) argued that the reflection of a speaker's overall knowledge differentiates mirativity from evidentiality which centers on the nature of the source of information. The dissimilarities of these two grammatical markings are not discussed in this article.

mirativity is a linguistic category that describes the speaker's (and addressee's) means of expressing the newsworthiness of a proposition.

In many languages, mirativity is expressed through (verbal) affixation as in (1a), complex predication as in (1b), or pronouns as in (1c). Furthermore, mirativity may be expressed through other lexical means such as *pala* in Tagalog, as shown in (1d).

(1a) Chechen mirative affix

Hwazh-ahw,	*j-ied-iq*	*iza*
Look.IMPF-IMPV.POL	j-run.IMPF-RECWITPST-MIR	3SG.NOM(J)

'Look! It has escaped.' (Aikhenvald 2012:446)
Context: The children were playing with a chicken, putting it into a cage, and it escaped. The speaker and the addressee saw the event.

(1b) Tariana mirative complex construction

Harame-mhe	*pi-a-sika*
be.scared-appear.MIR	2SG-AUX.MIR-RECPST.assumed

hanu-yakale-nuku
big-clf.village-TOP.NON.A/S
'You have been scared of the big city.' (Aikhenvald 2012:446)
Context: Assumed by the speaker, based on deduction, and to the speaker's surprise

(1c) Hone mirative pronoun

kū-yāk	*bcá*
NSP.3SG-PFV-cry	MIR.3SG

'He/she went on unexpectedly [despite the fact that it was forbidden].' (Aikhenvald 2012:446)

(1d) Tagalog mirative particle

(Ah!)	*Ikaw*	*pala*	*'yon.*
Oh	you	MIR	that

'Oh, that was you! (I just realized).' (Anderbois 2018:5)

There are a few studies that substantiate the range of mirative meanings of lexical elements or particles in Philippine languages. In Tagalog, AnderBois (2018:2) uses the term mirativity to describe the semantic and pragmatic configuration of the lexical element pala in (1d) which conveys "a sudden revelation about the illocutionary update being performed". However, studies on other Philippine languages such as Ilocano, Karao, and Itawis mostly explain the syntactic functions of lexical elements that convey mirativity. They did not use the term mirativity nor mirative to explain this linguistic category. For example, the Ilocano mirative marker *gayam* in (2) is only described as a marker that expresses surprise.

(2) Ilocano *gayam*

Nalaingka	gayam.
na-laing=ka	*gayam*
ADJF-good=2SG.ABS	so

'So you are good (at the piano, etc.: I did not know before). (Rubino 1997:330)

In order to understand the subset of mirative meanings grammaticalized in three Northern Luzon languages, this article explains the relationship between the cross-linguistic studies on mirativity and the meanings of mirative markers *gayam* (used in Ilocano and Karao) and *balattan* (used in Itawis). Specifically, it aims to answer the following questions below to analyze and describe the syntactic positions and semantic configuration of these expressions.

(i) What syntactic positions do *balattan* in Itawis and *gayam* in Ilocano and Karao occupy?
(ii) What are the parameters in defining mirativity in Ilocano, Itawis, and Karao?
(iii) What mirative values or attitudes do *gayam* (in Ilocano and Karao) and *balattan* (in Itawis) convey?

2 Method

The current study uses spoken and written materials. Through a written consent, the participants of the study agreed to record their conversation using the Voice Memo application. These conversations consisted of face-to-face conversations with a family member. They involved random topics about their lives and current issues that concern them. There are two recordings from each participant that vary from 15 to 20 minutes in length. As supplementary materials, this study also utilizes written data from online public portals (e.g., magazines, government websites, blogs in Ilocano). Then, constructions containing mirative markers were extracted from the materials. The participants recorded in the study were also consulted on the nuances in the meanings of expressions and constructions that encode mirative meanings. The language subgroup, EGIDS level, geographical distribution of speakers, and number of speakers for each language are summarized in Table 1.

Table 1: *Language Background of Ilocano, Karao, and Itawis*

Language	**Subgroup** (Eberhard, David, and Charles 2024)	**EGIDS Level** (Eberhard, David, and Charles 2024)	**Areas/Regions using the language** (Eberhard, David, and Charles 2024)	**Native Speaker Population** (Eberhard, David, and Charles 2024)
Ilocano	Northern Luzon	3 (Wider Communication)	Ilocos Sur, Ilocos Norte, Abra, La Union, Cagayan Valley, Babuyan Islands, Mindoro, Mindanao areas	6,370,000 in Philippines
Itawis	Northern Cordilleran	5 (Developing)	Apayao province, Conner municipality, Cagayan Valley region	189,000
Karao	Meso-Cordilleran	5 (Developing)	Benguet province, Bokod municipality, Ekip and Karao villages	3,690 (2010 census)

3 Brief introduction to the morphosyntax of Ilocano, Itawis, and Karao

Before delving into the meanings and functions of mirative markers in Ilocano, Karao, and Itawis, I will briefly describe the basic case markers and basic verbal constructions of these languages to acquaint us with the basic predicational word order of these Northern Luzon languages.

3.1 Ilocano, Itawis, and Karao case marking

Similar to other Philippine languages, Ilocano, Itawis and Karao are predicate-initial languages. The predicate of a construction (e.g., verb, existential, or adjectival elements) occurs first before the grammatical arguments and/or adjunct elements (e.g., adverbs or adverbial clitics). Grammatical arguments in these languages are introduced by nominal case markers that have varied phonological forms and sometimes cliticized variants, as in Karao. These markers may indicate various cases – absolutive, ergative, and oblique. In prototypical transitive verbal constructions, the patient argument

is absolutive-marked, and the agent argument is ergative-marked. In a prototypical intransitive construction, the agent or doer, which is the only core argument, is absolutive-marked. In semantically transitive but grammatically intransitive constructions, the (semantic) agent or doer is absolutive-marked, and the (semantic patient) extended argument is oblique-marked. Nolasco and Saclot (2006) referred to this structure as syntactically transitive or S-transitive but are grammatically intransitive or M-intransitive construction. The subsequent sections in this article provide sample sentences.

3.2 Basic verbal transitivity in Ilocano, Itawis, and Karao

Syntactic transitivity is concerned with the valence required by the verb predicate of a clause. This valence is "the set of argument positions that the verb takes together with their grammatical properties" (Haspelmath 2021:3). A prototypical intransitive construction in these languages has only one absolutive core argument which is marked by either a personal or non-personal nominal marker. In Ilocano, the prototypical intransitive construction in (3a) *Nadungpar ni R* 'R was hit (accidentally by something)' has the verb *nadungpar* 'hit accidentally' which functions as the predicate. Its core argument *ni R* is preceded by a personal absolutive marker ni. In (3b), the verbal predicate *nallabbet* 'went home' takes the NP argument *abbing* 'child' that is preceded by the absolutive non-personal case marker *yo*. In (3c), the verb *jo'kow* 'sleep' serves as a predicate. It only takes the agent argument *nga'nga 'child'*, which is preceded by the absolutive non-personal case marker *i*.

(3a) Prototypical Intransitive Construction in Ilocano
Nadungpar ni R.

na-dungpar	*ni*	*R*
INT.R-hit	SG.PER.ABS	R

'R was hit (by something accidentally).'

(3b) Prototypical Intransitive Construction in Itawis
Nallabbet yo abbing.

naK-labbet	*yo*	*abbing*
INT.R-be home	SG.NPER.ABS	child

'The child went home.'

(3c) Prototypical Intransitive Construction in Karao
Onjo'kow 'i nga'nga.

on-jo'kow	*'i*	*nga'nga*
INT.IR-sleep	SG.NPER.ABS	child

'The child will sleep.'

Aside from the prototypical intransitive constructions, these languages also have an extended intransitive construction (EIC), which has a core argument (S) and an extension of the core argument (E). In (4a), the Ilocano verb *makakitanto* 'you will be able to see (something)' is the predicate of the extended intransitive construction. The predicate is followed by the (S) argument L marked by the absolutive nominal marker da and the (E) argument *al-alya* 'ghost' marked by the oblique nominal marker *iti*. In (4b), the verbal predicate *guminatang* 'bought' takes the absolutive S argument *nak* 'I' and the E argument *mangga* which is preceded by the oblique marker *kang*. In (4c), the construction is headed by the verb *mengeked* 'will cut'. It is followed by the absolutive-marked agent (S) argument *to'o* 'person' and the oblique-marked (E) argument *pakod* 'rope'.

(4a) Extended Intransitive Construction in Ilocano
Makakitanto da L iti al-alya.

maka-kita=nto	*da*	*L*	*iti*	*al-alya*
INT.IR.ABIL-see=FUT	3PL.ABS	L	S.OBL	ghost

'They including L will be able to see a ghost.'

(4b) Extended Intransitive Construction in Itawis
Guminatang nak kam mangga.

<umin> gatang	*nak*	*kang*	*mangga*
<INT.R> buy	1SG.ABS	1SG.OBL	mango

'I bought a mango.'

(4c) Extended Intransitive Construction in Karao
Mengeked 'i to'oy pakod.

meN-eked	*i*	*to'o*	*na*	*pakod*
INT.IR-cut	SG.NPER.ABS	person	OBL	rope

'The person will cut a rope.'

Moreover, a transitive construction in these languages has two arguments, i.e., the ergative agent argument and the absolutive patient argument. In (5a), the transitive construction headed by the predicate *patayen* 'to kill' takes an ergative pronominal agent argument *=da* 'they' and a patient argument *silaw* 'light (bulb)' marked by the absolutive nominal marker *ti*. In (5b), the patient argument *danum* 'water', which is preceded by the non-personal case marker *yo*, is absolutive-marked. On the other hand, the pronominal agent argument *ko* 'I' is ergative-marked. In (5c), the construction is headed by the verb predicate *ekeden* 'to cut'. The (most affected) patient argument *pakod* 'rope' is absolutive-marked, while the agent pronominal argument *na* 's/he' is ergative-marked.

(5a) Transitive Construction in Ilocano
Patayenda ti silawen.

patay-en=da	*ti*	*silaw=en*
kill-TRA.IR=3PL.ERG	SG.NPER.ABS	light=already

'They will turn off the light already.'

(5b) Transitive Construction in Itawis
Ininom ko yo danum.

in-inom	*ko*	*yo*	*danum*
TRA.R-drink	1SG.ERG	SG.NPER.ABS	water

'I drank the water.'

(5c) Transitive Construction in Karao
Ekeren na to'oy pakod.

eked-en	*na*	*to'o-i*	*pakod*
cut-TRA.IR	SG.NPER.ERG	person-SG.NPER.ABS	rope

'The person will cut the rope.'

3.3 Syntactic positions of mirative markers in Ilocano, Itawis, and Karao

After providing an overview of the basic verbal predication and word order of these languages, I will now show the syntactic positions of mirative marker in Ilocano, Itawis, and Karao. They may take clause-initial, clause-final, and second positions.

3.3.1 Clause-initial Mirative Marker

The mirative marker *balattan* in Itawis may take the clause-initial position. In (6a), the speaker realizes that the object in question represented by the word *yan* 'that' is not beautiful.

(6) Clause-initial mirative marker in Itawis
Balattan mari nakasta yan.
balattan *mari* *nakasta* *yan*
MIR NEG beautiful that
'Oh, that was not beautiful.'

3.3.2 Second Position Mirative Marker in Ilocano, Itawis, and Karao

The mirative markers *gayam* (in Ilocano and Karao) and *balattan* (in Itawis) may take the second position in a clause. In this position, the speakers express their surprise to the action done by the participants. For example, the actions done by the participants are unexpected by the speakers (e.g., *napan* 'went' in [7a], *maggatang* 'will buy' in [7b], and *yandaba* 'washed' in [7c]).

(7a) Second position mirative marker in Ilocano
Napan gayam isunan?
napan *gayam* *isuna=n*
INT.R.went MIR 3SG.ABS=already
'Oh, s/he went already?'

(7b) Second position of mirative marker in Itawis
Maggatang balattan kang baggat y nanang.
maK-gatang *balattan*
INR.IR-buy MIR

kang *baggat* *i* *nanang*
SG.OBL rice grains SG.PER.ABS mother
'Oh, mother will buy rice.'

(7c) Second position mirative marker in Karao
Yandaba gayam si A.
y*an-daba* *gayam* *si* *A*
INT.R-wash MIR SG.PER.ABS A
'Oh, A washed (something).'

3.3.3 Clause-final mirative markers in Ilocano, Itawis, and Karao

The mirative markers *gayam* (in Ilocano ang Karao) and *balattan* (in Itawis) may also take the clause-final position. Similar to their function when they occupy the clause-initial position, these markers scope over the whole clause. The Ilocano mirative marker *gayam* in (8a) modifies the clauses *aggraduar isuna* 's/he will graduate'. Itawis mirative marker *balattan* in (8b) modifies the clause *kinaretutan ka y A* 'A left you'. Karao mirative marker *gayam* in (8c) modifies the clause *nat yandotho kayo* 'you did not cook'.

(8a) Clause-final position mirative marker in Ilocano
Aggreduar isuna gayam.
ag-greduar *isuna* *gayam*
DEL-graduate 3SG.ABS MIR
'Oh, s/he will graduate.'

(8b) Clause-final position mirative marker in Itawis
Kinaretutan ka y A balattan.

<in> karetut-an	*ka*	*i*	*A*	*balattan*
<TRA.R>run-APP	2SG.ABS	SG.PER.ERG	A	MIR

'Oh, A left you.'

(8c) Clause-final position mirative marker in Karao
Nat yandotho kayo gayam.

nat	*yan-dotho*	*kayo*	*gayam*
NEG	INT.R-cook	2PL.ABS	MIR

'Oh, you did not cook,'

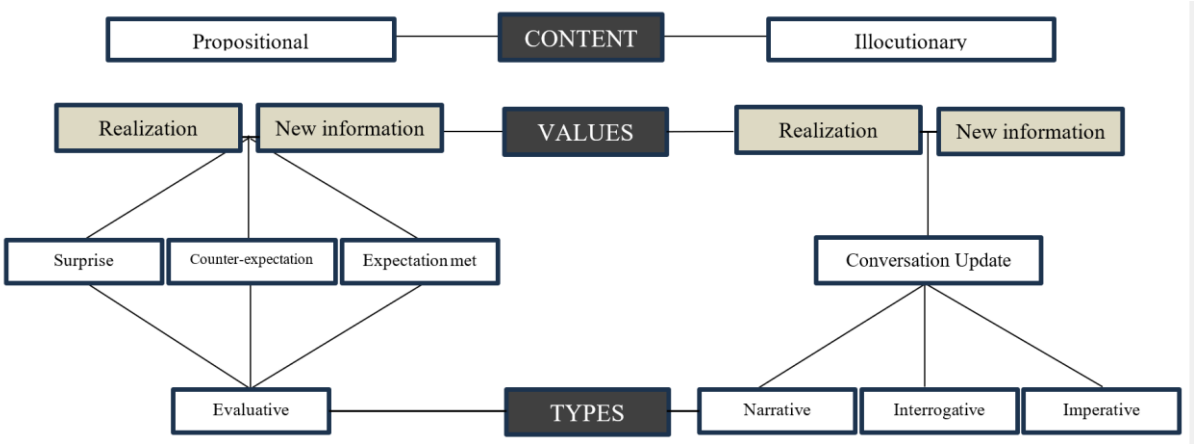
Mirative markers in Ilocano, Itawis, and Karao may take clause-initial (only *balattan* in Itawis occurs in this position), second, and final positions. In clause-initial and final positions, *balattan* (in Itawis) and *gayam* (in Ilocano and Karao) modify clauses. On the other hand, they modify grammatical elements that come before them when they occur in second position.

4 Mirative meanings in Ilocano, Itawis and Karao

Surprise and new information are the common mirative meanings discussed in previous literature on mirativity. However, there are other mirative meanings or notions related to them (e.g., [i]sudden discovery, revelation, or realization, [ii] surprise, and/or [iii] counter expectation). In this article, I argue that mirativity is the linguistic domain of expressing the primary surprise-induced meanings of new information and realization along with surprise, counter-expectation, and expectation met. In a surprise-induced mental state, the speaker may experience mental, physical, or behavioral responses (Zhuang 2023). This cognitive state is automatically encoded and translated into a combination of linguistic responses or attitudes using grammaticalized means of expressing them. A person's mental state processing new information leading to one's realization of connections between and among personal experiences or knowledge of an event may also induce other responses or attitudes. This multitude of attitudes may be experienced by the speaker at the same time. This argument is in consonance with Zhuang's (2023) argument that "mental states are multidimensional, in the sense that they can, and typically do, simultaneously instantiate multiple properties that pertain to different types of phenomena" (p. 49). In Figure 1, the current study presents the relationship between and among the parameters in describing mirative meanings in Ilocano, Itawis, and Karao based on the works of Aikhenvald (2012) and Zhuang (2023).

The perspectives on propositional and illocutionary distinction are employed in this article to explain the semantic functions of selected mirative expressions in Ilocano, Itawis, and Karao. Propositional mirativity, on the one hand, is concerned with the speaker's use of mirative marker to convey her/his attitude towards a proposition. On the other hand, illocutionary mirativity is defined as the use of mirative markers to express attitudes towards a speech act. Values and types are used to explain the mirative content in these languages. Values in this article refer to various mirative attitudes the speaker intends to express towards a certain proposition or speech act. The primary mirative values or responses include new information and realization. In propositional mirativity, these attitudes may simultaneously be experienced by the speaker with other mirative attitudes or values such as surprise, counter expectation, or expectation met. In illocutionary mirativity, these attitudes function as conversation updates. The type of mirative attitudes depends on the meaning conveyed by these morphemes. According to Zhuang (2023), cognitive mirative attitudes refer to those propositions that convey the acquisition of knowledge, whereas evaluative mirative attitudes refer to those that express counter-expectation and multidimensional mirative attitudes. With this distinction, I argue that propositional mirative attitudes in these three languages fall under evaluative mirative attitudes since they instantiate multidimensional attitudes by the speaker. In addition, illocutionary mirative attitudes may serve as a narrative, interrogative, or imperative update.

Figure 1: *Conceptual map of mirative meanings in Ilocano, Itawis, and Karao based on Aikhenvald (2012) and Zhuang (2023)*



The mirative markers *gayam* (in Ilocano and Karao) and *balattan* (in Itawis) may convey realization and new information along with other mirative values including surprise, counter-expectation, or expectation met. These meanings and values are the speaker's personal evaluation of a proposition. Since mirative morphemes in Ilocano, Itawis, and Karao may simultaneously convey various mirative attitudes, they all fall under evaluative mirative markers.

4.1.1 Realization, New Information, and Surprise

In Ilocano, Itawis, and Karao, mirative values – realization, new information, and surprise – may simultaneously be conveyed by the speaker. In (9a), the agent realizes that there are pieces of nuts in her/his food. This new information is coupled with the mirative value surprise which is akin to shock. The information causes the agent to experience anxiety because s/he may experience negative effects of nut intake (e.g., allergies). The example in (9b) is similar to that in (9a). It also illustrates the speaker's surprise. However, the surprise condition in (9b) is akin to the suddenness of acquired information after a moment of mental processing. The speaker realizes that s/he, indeed, knows the participant. This new information also triggers a surprise response from the speaker. The example in (9c) is also different from (9a) and (9b). In (9c), the surprise is a response to unexpected knowledge acquired by the speaker. The agent in this example has pre-existing knowledge about the participant's residence. However, the speaker realized new information about the participant in question. This new information activates a surprise response caused by the contradiction of the prior knowledge and new information acquired by the speaker. This claim is consistent with Zhuang (2023) stating that counter-expectation induces surprise.

(9a) Ilocano

Context: While eating, the speaker chewed some small pieces of nuts in her/his food. The speaker is surprised that her/his food has peanuts which s/he is allergic to. The speaker says:

Adda gayam mani daytoy kanek.				
adda	*gayam*	*mani*	*daytoy*	*kanen=k*
EXIST	MIR	peanut	this	food=1SG.POSS

'Oh, my food has peanut.'

(9b) Itawis
Context: The speaker bumped into the addressee who answered the speaker's question in the speaker's previous presentation. The participant is trying to introduce herself, and suddenly the speaker says:

Ikaw balattan nattabag kaniakan.
ikaw *balattan* *naK-tabbag* *kaniakan*
2SG.ABS MIR INT.R-answer SG.OBL
'Oh, you answered me.'

(9c) Karao
Context: The speaker knows that the addressee speaks Cebuano fluently. Based on this, s/he believes that the addressee is from Cebuano-speaking territory. When the speaker finds out that the addressee is from Ilocos Sur, s/he says:

Idoko ka gayam a!
idoko *ka* *gayam* *a*
Iloko 2SG.ABS MIR PAR
'Oh, you are Iloko!'

4.1.2 Realization, New Information, and Counter-expectation
Aside from surprise that goes with realization and information, counter-expectation along with realization and new information may also be expressed by a speaker of these languages. In the examples in (10), the speakers have prior knowledge about the participants involved. This knowledge may come from personal experience with the participants or from other sources. In (10a), the speaker knows that K is boring. Moreover, the example in (10b) shows that the speaker knows about the addressee's cooking capability. In (10c), the speaker knows that the addressee is not the kind of person who prepares for any examination. In these examples, the speakers use mirative markers to mark the speaker's realization of new information. In (10a), the speaker shares with the addressee that K is not a boring person. This new information contradicts her prior knowledge about K. Similarly, the speaker in (10b) expresses a counterintuitive response about the addressee's cooking skills. In (10c), the speaker conveys her/his realization about what the addressee's action. This realization counters the speaker's belief that the addressee does not prepare before any academic tasks.

(10a) Ilocano
Context: The speaker has expressed her contradiction of her preconception that K is a boring person after her/his experience with K in a party. The speaker says:

K, haan ka met gayam nga boring.
K *haan* *ka* *gayam* *nga* *boring*
K NEG 1SG.ABS MIR LKR boring
'K, (It is surprising that) you are not boring.'

(10b) Itawis
Context: The speaker knows that the addressee is not really good at cooking because of what s/he heard their common friends; however, the speaker learned that the addressee cooks delicious food. The speaker says:

Ammo balattan yo malluto.
ammo *balattan* *yo* *maK-luto*
know MIR SG.NPER.ABS INT.IR-cook
'Oh, you know how to cook.'

(10c) Karao
Context: The speaker knows that her/his addressee is not fond of reading nor reviewing her school notes. When the speaker sees the addressee busy memorizing her/his speech for a school presentation, the speaker says:

Nayanbasaka met gayam.
na-iyan-basa=ka *met* *gayam*
INT.R-read=2SG.ABS PAR MIR
'Oh, you are reading'

4.1.3 Realization, New Information, and Expectation Met
According to AnderBois (2018), there are circumstances where the prior knowledge of the speaker is confirmed by new information after the speaker realizes the connection between her/his prior knowledge about an event and the new information that confirms this realization. The examples in (11) show that the speakers have prior knowledge of an event (e.g., rain) in (11a) and objects (e.g., wallet) in (11b) and dress in (11c). What affects the realization of the connection between the prior knowledge and the confirmation is the (un)preparedness of the speaker with respect to an emergent novel information. This relationship may also help us understand the obscure "unprepared mind" mirative value posited by Aikhenvald (2012). Zhuang (2023) explained that "prepared mind" describes circumstances where the speaker actively generates a set of expectations until her/his prior knowledge is confirmed. This phenomenon is illustrated in (11b) and (11c). On the other hand, the proposition in (11a) shows the "unpreparedness" of the speaker because s/he is preoccupied with events that are not relevant or connected to her/his previous knowledge about the incoming rain. In this instance, the speaker is unable to generate expectations that are related to her/his prior knowledge about the incoming rain.

(11a) Ilocano
Context: The speaker knows that there is rain coming because s/he is aware of the of the weather bulletin for the day. When s/he goes out of the building and sees that it is raining, s/he says:

Agtutudo gayamen.
ag-tud~tudo *gayam=en*
DEL-CONT~rain MIR=already
'Oh, it is already raining.'

(11b) Itawis
Context: The speaker is asked to look for the wallet in his/her room. In addition, the speaker expects that her/his sister keeps her wallet in the cabinet. When the speaker finds it, s/he says:

Awan bitu kanyaw ay nyan balattan chaw.
awan *bitu* *kanyaw* *ay* *nyan*
NEG counter expect here oh EXIST

balattan *chaw*
MIR here
'It is not here; oh, it is here.'

(11c) Karao
Context: The speaker tries to find her/his favorite dress in her cabinet. At first, s/he cannot find it. However, after patiently looking for it and finds it out, s/he says:

Mitak ma, eta-kepan gayam na bakjot.

matha-i=ak	*ma*	*e-takepan*	*gayam*
see-INT.R=1SG.ABS	PAR	STAT-cover	MIR

na	*bakjot*
SG.NPER.ERG	clothes

'I saw (it) already. It was covered with clothes.'

5 Illocutionary mirative values in Ilocano, Itawis, and Karao

There was an indisputable notion that mirativity only describes the speaker's surprise as a response to new information. However, this notion is challenged by AnderBois's (2018) discussion of mirative markers that convey attitudes towards speech acts. Mirative markers of this nature may be used in non-declarative constructions, such as imperative and interrogative. Similar to AnderBois (2018) and Zhuang's (2023) analysis, mirative markers in Ilocano, Itawis, and Karao may also be used to encode what AnderBois (2018) calls an illocutionary update. In this article, I will present narrative, imperative, and interrogative updates using mirative markers in Ilocano, Itawis, and Karao.

5.1 Narrative update

Markers of mirativity in Ilocano, Itawis, and Karao may express attitudes towards speech acts when used in declarative forms. The speaker uses these markers when s/he suddenly remembers that s/he needs to tell the addressee information that serves as illocutionary update in a discourse event. In (12a), *gayam* in Ilocano is used in a context where the speaker wishes to inform the addressee that M is sick. In (12b), *balattan* in Itawis is used to convey the speaker's intention to share his/her bad experience with the object in question. In (12c), *gayam* in Karao is used to express the speaker's knowledge about Aunt K. In a conversation, the speaker and the addressee engage in what Zhuang (2023) called as communal act of proposing information in a discourse event. The speaker in this communicative event tries to endorse information that may be added to the Common Ground of all discourse participants. The examples then illustrate mirative attitude towards a speech act which is in consonance with Zhuang (2023) and AnderBois (2018) argument that mirative markers are linguistic forms that are used to make information visible or understandable to all discourse participants. In these instances, the speaker suddenly remembers information s/he needs to share with the addressee to address the other participant's difficulty to comprehend connections between and among narrative details.

(12a) Narrative update in Ilocano
Context: The speaker is talking about G who is close to the speaker. S/he suddenly realizes that the person in question has not reached out any of them for the last few months. S/he says:

Ay masakit gayam ni M.

ay	*ma-sakit*	*gayam*	*ni*	*M*
oh	ADJF-illness	MIR	SG.PER.ABS	M

'Oh, M is sick.'

(12b) Narrative update in Itawis
Context: In a conversation, the speaker remembers that the object in question has defects and realizes that s/he has unpleasant experiences when s/he used it. The speaker says:

Mari balattan nga nakasta yan.
mari *balattan* *nga* *nakasta* *yan*
NEG MIR LKR beautiful that
'Oh, that is not good.'

(12c) Narrative update in Karao
Context: The addressee talks about the death of Aunt K. Suddenly, the speaker remembers that a few days before Aunt K's death, s/he saw that Aunt K was taken to the hospital. The speaker says:

Mitak gayam si Anti Karing. Inkowan ched ospital nonta ka-cheman.
matha-i=ak *gayam* *si* *Anti* *K*
see-INT.R=1SG.ABS MIR SG.PER.ABS Aunt K

in-kowan *cha* *ched* *ospital*
TRA.R-go 3PL.ERG SG.OBL hospital
'Oh, I saw Aunt K. They delivered her to the hospital.'

5.2 Imperative update
Aside from the illocutionary functions of mirative markers in declaratives, these linguistic expressions may also be used in imperatives. Cross-linguistically, imperatives may express the speaker's desire for a discourse participant to carry out an action. In some cases, the speaker uses mirative markers to provide an update to a previously issued command. In (13), the speakers have already asked the addressees to carry out some actions until the speakers suddenly remember additional actions that need to be accomplished by the addressees, such as cleaning the garage in (13a), getting the pot from Aunt Boots in (13b), and paying Aunt M in (13c). In these examples, the new information that functions as an imperative update seems to have been suspended or delayed because there is a tendency for the speaker to miss out a command or the speaker realizes the utility and relevance of a command just after the issuance of other requests. In some cases, some addition particles such as *pay* 'also' as in (13a) to emphasize this additional information.

(13a) Imperative Update in Ilocano
Context: The speaker asks another participant to do clean the backyard. S/he remembers that s/he also wants the garage to be cleaned. S/he says:

Ay wen, dalusam pay gayam diay garahe.
ay *wen* *dalus-an=mo* *pay* *gayam*
oh yeah clean-APP=2SG.ERG also MIR

diay *garahe*
SG.DIS.ABS garage
'Oh yeah, (you) also clean the garage.'

(13b) Imperative Update in Itawis
Context: The speaker suddenly remembers another task that must be accomplished by another participant. S/he says:

Alakam mu balattan yo kaldero nga sinakko y anti Boots.

alakan	*mu*	*balattan*	*yo*	*kaldero*
get	2SG.ERG	MIR	SG.NPER.ABS	pot

nga	*<in>takko*	*i*	*Anti*	*Boots*
LKR	<TRA.R> borrow	SG.ABS	Aunt	Boots

'Oh, get the pot that Anti Boots borrowed'

(13c) Imperative Update in Karao
Context: The speaker enumerates the things the addressee should do when s/he goes out. When the speaker suddenly remembers that they need to pay Aunt M, s/he says:

Mo gayam bayari othang tayod Anti M.

Mo	*gayam*	*bayari*	*othang*	*tayod*
2SG.ERG	MIR	pay	debt	1PL.INCL.POSS

Anti	*M*
Aunt	M

'Oh, pay our debt to Aunt M.'

5.3 Interrogative update
After discussing the use of the languages' mirative markers in imperatives, we now turn to their functions when used with interrogatives. Similar to declarative and imperative forms, mirative markers in interrogatives are used to express the utility of a question suddenly remembered by the speaker. This context is illustrated when the speaker asks about the name that needs to be used in the form in (14a), the co-maker when borrowing a money from a lending company in (14b), and the method of sending cash assistance in (14c). This argument is similar to the claim of AnderBois (2018:13) in Tagalog interrogative contexts that license the use of *pala* to express "sudden remembering of a prior intent to ask a question or suddenly realizing the relevance or need of a given question".

(14a) Interrogative update in Ilocano
Context: When the speaker filled out a form, s/he left out the name to be used at first because s/he was uncertain about the name to be used in the form. After completing the form, s/he realized that s/he needed to ask whose name must be written on the form. The speaker forgot the name of the payor, so s/he asks the other participant about it. S/he says:

Sino gayam ti ikabil ko ditoy?

sino	*gayam*	*ti*	*ikabil*	*ko*	*ditoy*
what	MIR	SG.NPER.ABS	put	1SG.ERG	here

'Oh ,who will be put here?'

(14b) Interrogative update in Itawis
Context: The speaker asks the addressee the important details on how to borrow money from a bank. S/he already asked a few questions and suddenly remembers a question. The speaker says:

Kunnasi balattan nu awanmu co-maker?
kunnasi *balattan* *nu* *awan=mu* *co-maker*
how MIR if N.EXIST=2SG.POSS co-maker
'Oh, what if you do not have a co-maker?'

(14c) Interrogative Update in Karao
Context: The speaker and the addressee are talking about the financial assistance from the government. The speaker and the addressee already discussed some important details about it, but when the speaker suddenly remembers about the method of sending the cash assistance, s/he says:

Empiyan gayam i pengi-iken chen ma chegwen dibo?
empiyan *gayam* *i* *pengi-iken* *chen*
INTER MIR ABS NMLR-give PL.PER.ERG

ma *chegwen* *dibo*
PAR two thousand
'Oh, how will they give the two thousand?'

6 Conclusion and Summary

As for syntactic distribution, mirative markers in Ilocano, Itawis, and Karao take different syntactic positions. *Balattan* in Itawis may take clause-initial position. In this position, it modifies the whole clause. In addition, *balattan* in Itawis and *gayam* in Ilocano and Karao may also take second position. In this position, they modify the element that comes before them. These morphemes may also take clause-final position where they may modify the whole clause.

As for semantic properties, *balattan* in Itawis and *gayam* in Ilocano and Karao may express various mirative meanings. Propositional mirative meanings in these languages convey the primary mirative attitudes of realization and new information. The realization of new information may activate the speaker's response (e.g., surprise) and violate (counter-expectation) or confirm (expectation met) her/his expectations. Since these mirative markers convey various mirative notions, they are grouped with what Zhuang (2023) called evaluative miratives. On the other hand, illocutionary mirative meanings focus on conversational updates (e.g., narrative, imperative, and interrogative) that are necessary in proposing new information that may guide participants or aid in understanding the discourse event in question.

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TRANSITIVE, INTRANSITIVE AND DETRANSITIVE IN WARAY

Thomas E. PAYNE, and Voltaire Q. OYZON
University of Oregon; SIL International and Leyte Normal University
tpayne@uoregon.edu, v.oyzon@gmail.com

Abstract
Waray is a major language spoken in the Eastern Visayas region of the Philippines. In this paper we advance the claim that genitive marked undergoers in clauses describing transitive situations are not direct objects, but a kind of oblique constituent. Their grammatical properties result from speakers' choice to "de-perspectivize" the undergoer. Consequently, constructions that have been called "Actor-voice" can be understood as grammatically intransitive. This observation has profound consequences for the conceptualization of voice and grammatical relations in Philippine languages.

Keywords: morphology, syntax, case, transitivity, Philippines
ISO 639-3 codes: war (Waray); tgl (Tagalog)

1 Introduction
Voice and case are extremely controversial topics in linguistic descriptions of Philippine languages. We will not summarize the many studies that have characterized this debate over the years. Rather our intent in this brief paper is to address one issue that seems to be key—namely the question of whether non-topic[1] undergoers are core arguments or not. If they are, then most Philippine languages exhibit a rare or unique voice system in which there are two "symmetrical" transitive clause constructions, with the grammatical relations of the actor and the undergoer simply reversed (Foley 2007:23). Pairs of examples similar to the following are often presented to show that the actors and undergoers may be expressed in the same grammatical case, depending on the morphology of the predicating word. These examples are in Waray, a Philippine language spoken by about three million people in the Eastern Visayas region of the Philippines. The prenominal marker *han* in Waray is also a marker of an adnominal genitive. For this reason, some authors (Kroeger 1993, Chen and McDonnell 2019, *inter alia*) consistently gloss the corresponding Tagalog morpheme *ng* as GEN. Others (e.g. Foley 2007) consistently gloss the same morpheme as CORE when it marks a clause constituent but GEN when it marks an adnominal genitive. Here we are applying Kroeger's Tagalog glosses to the comparable morphemes in Waray:

(1) a. *Ginhilot han nanay an batà.*

Gin-hilot	*han*	*nanay*	*an*	*batà.*	Undergoer Voice (NOM = undergoer)
PAST.UV-massage	GEN	mother	NOM	child	

'The mother massaged the child.'[2]

[1] Various terms have been used for the "topic" nominal in the clause structure of most Philippine languages, including pivot, focus, nominative, absolutive, subject, and probably others. This is a grammatical relation signaled by the pre-nominal markers *ang* or *si* in Tagalog full noun phrases. The Waray equivalents are *an* and *hi*. By "non-topic" we mean any nominal element that does not bear this grammatical relation.

[2] In this paper, the first line in Waray examples is the official Waray orthography, as described in Nolasco, Oyzon and Ramos (2012; revision of 2017 currently under consideration by the Department of Education). The second line provides morphological analyses, following the Leipzig formatting conventions as far as possible (https://www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf). The third line gives the morpheme-by-morpheme glosses. Finally, the last line gives a free English translation. In examples (1)a and (1)b, glosses are consistent with the symmetrical voice hypothesis, while in the rest of the paper glosses of Waray examples are

b. *Naghilot han batà an nanay.*
Nag-hilot *han* *batà* *an* *nanay.* Actor Voice (NOM = actor)
PAST.AV-massage GEN child NOM mother
'The mother massaged the child.'

Such examples show, according to some linguists, that grammatical relations, signaled by the prenominal markers *an* and *han*, are reversed in these two clauses. Therefore, these two constructions are equally as transitive (see, e.g., Foley 1988, 2007:23, Kroeger 1993:47-48, Chen and McDonnell 2019:15, *inter alia*). The different "voice" prefixes on the verbs are the only indication of who is acting on whom (with constituent order serving a secondary function). This "symmetrical voice hypothesis" depends on arguments that nominal elements preceded by *han* as in (1a) and (1b) bear the same (core) grammatical relation.

One major alternative to this view is that the pre-nominal case markers are multifunctional, with *han* in (1a) marking the ergative relation in a transitive clause, and *han* in (1b) marking a kind of oblique phrase in a grammatically Intransitive clause[3]. In this paper, we would like to argue for this alternative on four grounds: 1) multifunctionality is normal in language. The fact that distinct grammatical categories overlap in form does not necessarily mean they have the same function. In particular, syncretism between ergative and genitive cases is not uncommon in the world's languages. 2) The nominals represented by *han nanay* in 1a and *han batà* in 1b do not have the same syntactic properties. In particular, they pronominalize differently and have different distributional properties. 3) The AV ("actor voice") affixes are those that occur in unquestionably intransitive clauses. Finally, 4) The history and typology of most Philippine languages lends itself to the kind of multifunctionality we are claiming for *han*.

2 Multifunctionality and genitive/ergative case syncretism

Multifunctionality in language is normal. In particular case syncretism (also known as isomorphism 'same form', or polysemy 'many meanings') is normal. Examples abound in which core and non-core cases overlap or are identical in form. In a typological study of case syncretism, Baerman and Brown

consistent with the alternative proposal advanced in this paper. Tagalog examples are formatted and glossed as in the sources.

References to the sources of examples are given in parentheses following the free translations. The primary published sources are the Corpora Project (2024), and Alunan (2016). The numbers in the Corpora Project references include the title of the text, and the sentence number within the text. Numbers in references to Alunan (2016) refer to the page number. Examples with no parenthesized references are from native speaker intuition or conversations. Each of these examples has been verified by at least two native speakers.

In the current official orthography, syllable prominence (either word stress, vowel length, or both) is not indicated when it is predictable. When it is unpredictable given the context, an acute accent indicates syllable prominence. Briefly, if the final syllable is prominent, no accent is needed. If there is a "heavy" syllable (CVC, or CV:) anywhere in the word other than the last syllable, the prominence predictably moves to the left, and so is not indicated. All other prominent syllables in indigenous Waray words are indicated with an acute accent. In Spanish and English loan words, stress is not indicated at all. Syllable prominence alone may distinguish lexical items. In addition, several morphological distinctions involve changes in syllable prominence patterns. The glottal stop is a full, phonemic consonant, and is indicated in one of five ways: 1) words written with an initial vowel grapheme always begin with a glottal stop, e.g. *anak* [ʔanˈak] 'offspring'; 2) Sequences of vowel graphemes always involve an intervening glottal stop, e.g., *tiil* [tiˈʔil], 'foot', *bao* [baˈʔo] 'tortoise'; 3) Following a consonant, the glottal stop is indicated with a hyphen, e.g. *mag-áanak* [magˈʔaʔanak] 'will give birth' 4) At the end of a word in a prominent syllable, it is indicated with a circumflex over the final vowel, e.g., *kitâ* [kiˈtaʔ] 'to see'; 5) At the end of a word in a non-prominent syllable, it is indicated with a grave accent over the final vowel, e.g., *sikò* [ˈsi:koʔ] 'elbow'. In such cases the penultimate syllable is predictably prominent. Most published material in Waray does not follow the official standard, and simply omits diacritics entirely.

[3] In order to highlight the important distinction between semantic and grammatical transitivity, we will capitalize terms referring to grammatical Transitivity and not capitalize terms referring to semantic transitivity.

(2013) found that case syncretism was present in 40 of 73 languages they investigated that involved morphological case marking. They also mention Central Yup'ik as one language in which ergative and genitive cases are completely syncretic. To this we may add Mayan languages such as Ixil (Townsend 1986), and the Sahaptian language Niimi'ipuutímt (Nez Perce, Rude 1991). Therefore, the use of the prenominal marker *han* to mark an actor in (1)a and an undergoer in (1)b, while consistent with the symmetrical voice hypothesis, is not prima-facie evidence in favor of it.

3 Grammatical properties of genitive-marked undergoers

Genitive marked undergoers in Waray (*han bata* in 1b above) do not have syntactic properties of core arguments. In this section we will illustrate four ways in which they differ in syntactic properties from absolutive and ergative elements. These differences involve the treatment of pronouns and personal names, omissibility, movement and syntactic "control".

3.1 Pronouns and personal names

The examples in (1) illustrate sentences with full common noun phrase actor and undergoer. When these elements are pronouns or personal names, the grammatical differences between the ergative and non-topic undergoer cases begin to emerge. Ergative noun phrases may be replaced by the ergative/genitive pronouns, e.g., *niya* in (1)a, whereas undergoers in constructions such as (2)b and (2)c may not (glosses in the following Waray examples reflect the alternative analysis advanced in this paper):

(2) a. *Ginhilot niya an bata.*
g<in>-hilot ***niya*** *an* *batà.*
DEL<TR.R>-massage 3SG.ERG ABS.CONS child
'S/he massaged the child.'

b. *Naghilot* *an* *nánay* *niya.*
na-g-hilot *an* *nánay* ***niya***
INTR.R-DEL-massage ABS.CONS mother 3SG.GEN
'Her/his mother massaged (someone).'

c. **Naghilot* ***niya*** *an nanay.*

Example (2)b is perfectly grammatical, but the pronoun *niya* must be understood as an adnominal possessor of *nanay* 'mother'. It may not refer to the undergoer of the massage. The ungrammatical example (2)c also shows that *niya* may not refer to the undergoer, even if it is placed immediately after the verb.

Non-topic undergoers may be pronominalized, but not with the dedicated ergative/genitive pronouns. Rather an oblique form must be used, *ha iya* in the examples in (3):

(3) a. *Naghilot an nánay ha iya.*
na-g-hilot *an* *nánay* ***ha*** ***iya***
INTR.NEU.R-DEL-massage ABS.CONS mother OBL 3SG.OBL
'The mother massaged him/her.' (Less forcefully, without much effort, or improperly)

b. *Naghilot* ***ha iya*** *an* nánay. (Same basic meaning)

Similarly, when non-topic undergoers are referred to with personal names, the oblique forms must be used:

(4) Naghilot *an nánay kan Maria.*
na-g-hilot *an* *nánay* ***kan*** ***Maria***
INTR.NEU.R-DEL-*massage* ABS.CONS mother OBL.PERS Maria
'The mother massaged Maria.' (Less forcefully, without much effort, or improperly)

Constructions such as (3) and (4) illustrate at least two facts not often brought to light in descriptions of Philippine voice systems. Most relevant for the claims of this paper is that non-topic undergoers (*ha iya* in example 3, or *kan Maria* in example 4) are overtly marked as oblique rather than genitive (the genitive forms would be *níya* and *ni Maria* respectively). This is evidence that they are not core arguments, i.e., direct objects. Secondarily, such examples show that non-topic undergoers need not be indefinite, since pronouns and personal names necessarily refer to referents the speaker presents as identifiable. When occurring as full noun phrases, non-topic undergoers *often* are presented as non-referential, generic or incompletely affected, but this is only one manifestation of a more general function of such "actor voice" constructions. As argued in Payne and Oyzon (2022, 2024), the overarching function of these constructions is to mitigate scalar transitivity. The examples in (3) and (4) express the idea that the massage was less than fully effective for one reason or another. Effectiveness of the activity is one component of scalar transitivity, as observed in Hopper and Thompson (1980) and reiterated in Næss (2007) among others. This reduction in semantic transitivity motivates the use of an overtly marked grammatically Intransitive construction.

Another fact not often highlighted in studies that argue for or assume the symmetrical voice hypothesis is that the AV verb forms (examples 1b, 2b, 3 and 4) are the forms used for unquestionably intransitive situations. The roots illustrated below may only occur with Intransitive verbal inflection, unless a special transitive sense is intended or valence increasing morphology (causative or applicative) is used (see Payne and Oyzon 2023, 2024 for further details and argumentation):

(5) a. *Tumawa hiya.*
t<um>awa *hiya*
<INTR.R>smile 3SG.ABS
'S/he smiled.'

b. *Tumawa an batà.*
t<um>awa *an* *batà*
<INTR.R>smile ABS.CONS child
'The child smiled.'

(6) a. *Nagsayaw hi Lillia ha entablado.*
na-g-sayaw *hi* *Lillia* *ha* *entablado*
INTR.NEU.R-DEL-dance ABS.PERS Lillia LOC stage
'Lillia danced on stage.' (A particular, deliberate act).

b. *Sumayaw hi Lillia ha entablado.*
s<um>ayaw *hi* *Lillia* *ha* *entablado*
<INTR.R>dance ABS.PERS Lillia LOC stage
'Lillia (normally) dances on stage.' / 'Lillia danced (as expected) (on stage).'

c. *Magsasayaw hi Lillia ha entablado.*
*ma-g-sa~*sayaw *hi* *Lillia* *ha* *entablado*
<INTR.NEU. IR>-DEL-RED1-dance ABS.PERS Lillia LOC stage
'Lillia will dance on stage.'

Other verbs that fall into this class include *tindog* 'stand', *lakat* 'walk', *langoy* 'swim', *lukso* 'jump', *turog* 'sleep', *luhod* 'kneel' and many others. The conclusion is that the verb affixes (including *mag-*, *nag-* and <*um*> illustrated here) overtly express grammatical Intransitivity. If a semantically transitive situation is intended, one of the contrasting Transitive set of affixes (including <*in*>/*gin-* illustrated in 1a and 2a) must be used, often with accompanying valence increasing morphology (causative or applicative) in the verb stem.

From this point of view, AV constructions such as (1)b and (2)b are overtly marked as grammatically Intransitive. They express transitive situations in grammatically Intransitive constructions. In this respect they are similar to such English expressions as *Irving already ate, I saw, I conquered, She eats meat* or *She chewed on the bone*. These are all semantically transitive in that they describe activity that carries over from an actor to an undergoer. However, they are presented by the speaker as grammatically less than fully transitive in some way, either by omitting reference to the undergoer altogether, or treating it as indefinite, non-referential or incompletely affected by the activity of the predicate. These constructions say more about what the actor *does*, than what happens to some undergoer. Following in the tradition of Fillmore (1977)[4], we claim that such constructions "de-perspectivize" the undergoer.

Constructions parallel to those illustrated in (1)b, (2)b, (3) and (4) have been called "antipassives" in several studies of other Philippine languages, primarily studies grounded in theoretical frameworks such as Relational Grammar (Bell 1979, Gerdts 1988), and Generative Grammar (Aldridge 2004, 2012). Antipassive constructions were first identified by Silverstein (1976), who characterized them as the "mirror image" of passive constructions. Silverstein's insight is that, while both passive and antipassive constructions are based on a semantically transitive schema, a passive promotes the patient to the privileged syntactic position (subject), and demotes the agent to an oblique role. Conversely, an antipassive promotes the agent (to absolutive) and demotes the patient. Silverstein's view is based on a derivational model in which passives and antipassives are pragmatically-marked derivations of corresponding transitive constructions.

However, several studies of Philippine languages (e.g., Foley 1988, Kroeger 1993, Hemmings 2021) have pointed out that the construction represented in (1)b, (2)b, (3) and (4) lacks one of the features that characterize prototypical antipassive constructions in some other language families—namely there is no dedicated antipassive verb or verb-phrase morphology. This fact makes the construction appear less like the mirror image of a prototypical passive construction, since passives are (usually) glaringly marked with dedicated verb or verb phrase morphosyntax.[5] Furthermore, these constructions in Philippine languages are much more common in ordinary conversation than passive constructions tend to be in languages that have robust passives.

For these reasons (among others), we agree that, from a functional perspective, "antipassive" is not the most insightful descriptor for this construction type, our preferred term being "detransitive." A detransitive construction is not syntactically derived from a transitive construction any more than an English sentence like *Phillip already ate* is a syntactic derivation of *Phillip already ate my pizza*. The case marking and Transitive/Intransitive verbal inflections in Waray provide speakers with various alternatives for expressing a range of transitivity related functions, including downplaying the centrality, referentiality or specificity of the undergoer. In section 4 we will have more to say about the typological differences between English and Waray that lead to the two languages expressing such similar functions in such different ways.

[4] Fillmore (1977) famously made a distinction between elements that are in "primary perspective" and those that are in "secondary perspective" in discourse scenes. In that paper Fillmore firmly articulated the view that voice and grammatical relations were all about the speakers' perspectives on situations being discussed, and not necessarily about de-contextual semantic or pragmatic statuses of clause elements.

[5] It should be noted that not all linguists who have studied antipassives from a typological perspective insist that an antipassive construction must involve dedicated morphology. See, for example, Polinsky (2013), and Janic and Witzlack-Makarevich (2021:14-15).

3.2 Omissibility of the de-perspectivized undergoer

It has been claimed (e.g, by Chen and McDonnell 2019:15) that the undergoer in Actor Voice (AV) constructions must be a core argument in Tagalog because it cannot be omitted. This is false for Tagalog and for Waray. Most semantically transitive predicates may appear in an AV construction with no reference to an undergoer. Here are a few of the many examples that appear in the Waray corpus:

(7) *Nag-iininaw ngay-an hira, diri pa ngay-an nira igarawas hito nga oras.*
na-g-i~<in>inaw *ngay-an* *hira* *diri* *pa* *ngay-an* *nira*
INTR.NEU.R-DEL-INCMPL-REP-watch yet 3PL.ABS NEG CONT yet 3PL.ERG

i-g<ar>awas *hito* *nga* *oras*
APPL2-<DIST>flow.out DEMO2.ABS LK time

'They were just observing, (but) it was not yet time for them to go out.' (Alunan 2016: 3)

(8) *Di, pumakiana hira kun ano daw la adi.*
di *p<um>akiana* *hira* *kun* *ano* *daw* *la* *adi*
then[6] <INTR.R >ask 3PL.ABS if what HSY INCMPL DEMO3.ABS
'They asked (of themselves), what this could be.' (Alunan 2016: 4)

Examples (7) and (8) both illustrate roots that evoke transitive situations expressed in grammatically Intransitive frames with no genitive marked undergoer. Both of these verbs, like most roots that depict such semantically transitive situations, fall into a class which Payne and Oyzon (2020) call "agent-preserving labile roots". Example (8) illustrates one common usage of the <*um*> 'Intransitive, realis, controlled modality' infix. The default interpretation in this example is that the absolutive case actors (*hira*) ask themselves or one another, even though there is no reflexive nominal, or reciprocal marking on the verb that would enforce either of these interpretations.

In Waray and in Tagalog, there are some semantically transitive roots that do seem, at least out of context, to require overt expression of the undergoer in an AV construction. However, it must be pointed out that such apparent non-omissibility of elements does not automatically indicate those elements are direct objects—there are such things as "obligatory obliques". Consider such English clauses as *we went to your office*, and *Put the book on the table*. While a string like *we went* may be understood as a complete, fully grammatical clause, out of context it still seems to require a destination, which may only be expressed as an oblique or locational noun (e.g., *we went home*). Perhaps even clearer is the second example, in which the string **Put the book* is even more difficult to contextualize without an obligatory location expressed as an oblique.

3.3 Fronting of de-perspectivized undergoers

It has been claimed for Tagalog (e.g., by Kroeger 1993: 47) that the genitive-marked undergoer in a de-transitive construction is not an oblique argument because it cannot occur in front of the verb in the way obliques can: "(In Tagalog) genitive marked patients can never undergo Adjunct Fronting . . . This implies that they are terms, i.e., Objects, since any non-term can appear in this construction" (Kroeger 1993: 47). While the empirical observation is correct—obliques are often fronted and genitive marked undergoers are not—the conclusion that genitive undergoers are therefore core arguments (direct objects) does not follow. In fact core arguments do occur in preverbal position, in Tagalog and in Waray. In particular, absolutives serving any semantic role are the most likely clause elements to appear before the verb in both Tagalog and Waray—and absolutives are certainly core arguments (or "terms"). Ergatives may also appear before the verb when pronominalized. Therefore, the fact that genitive

[6] Speakers often use the contracted form of the irrealis negative marker *dirì* as a discourse connector. In this context, the best gloss is 'then'—it does not negate the following clause.

undergoers do not naturally occur before the verb sets them apart from both core arguments *and* most obliques.

The following are some Waray examples from the corpus showing that absolutives and ergatives may occur before the verb. Example (9) illustrates an absolutive actor in preverbal position (in this example and the following, the fronted elements are bolded).

(9) *Ini hi Nanay nagpípinamulod.*
Ini ***hi*** ***Nánay*** *na-g-pí~p<in>a-m-ulod.*
DEM.ABS ABS.PERS Mom INTR.NEU.R-DEL-INCMPL-<REP>-INF-PLC-cut.tree
'As for Mom, she was going around cutting down trees.' (Alunan 2016: 72)

Example (10) illustrates a fronted absolutive undergoer, while example (11) illustrates a fronted ergative pronoun:

(10) *An mga batô pinas-an níya.*
An ***mga*** ***bato*** *p<in>inas-an* *níya.*
ABS.CONS PL stone <TR.R>carry.on.shoulder-APPL1 3SG.ERG
'The stones he carried on his shoulders.' (Alunan 2016: 209)

(11) Translation of previous sentence: 'we stood up hurriedly and wiped the table.'

Akon ginkuha an pinggan ngan ginbutang didto han ligid han lamesa kun diin ako nalingkod.
Akon *g<in>kuha* *an* *pinggan* *ngan* *g<in>butang* *didto* *han* *ligid* *han*
1SG.ERG DEL<T.R>get ABS.CONS dish and DEL<TR.R>put there GEN.DEF edge GEN.DEF

lamesa *kun* *diin* *ako* *na-lingkod*
table if where 1SG.ABS R.HAP-sit
'I took the plate and put it near the edge of the table where I happened to be sitting.' (Corpora Project 2024: Essay by Carol Anne Aballar 75)

These examples show that indeed core arguments may be fronted in Waray. If genitive marked undergoers in de-transitive constructions were core arguments, we would expect that they could also be fronted. However, as Kroeger observes for Tagalog, this is not the case:

(12) **?Hin surat nagsurat an babáyi.*
Hin ***surat*** *na-g-surat* *an* *babáyi.*
GEN.INDEF letter INTR.NEU.R-DEL-write ABS.CONS woman
('A letter the woman wrote.')

(13) **?Han batà naghilot an babáyi.*
Han ***batà*** *na-g-hilot* *an* *babáyi.*
GEN.DEF child INTR.R-DEL-massage ABS.CONS woman
('The child the woman massaged.')

(14) **?Ha iya naghilot an babáyi.*
Ha ***iya*** *na-g-hilot* *an* *babáyi.*
OBL 3SG.OBL INTR.R-DEL-massage ABS.CONS woman
('Her/him the woman massaged.')

These sentences are interpretable but are described as poetic or "Yoda speech" by Waray speakers. No examples of fronted genitive or oblique marked undergoers have been found in the corpus. Part of the

reason for this prohibition against fronted preverbal non-topic undergoers is that they do not pronominalize in the same way as ergatives do (see section 3.1), and ergatives must be pronominalized in order to occur preverbally (see ex. 11). Pre-predicate arguments express contrastive focus. Since genitive undergoers are so often non-referential or otherwise "de-perspectivized," their pragmatic functions tend to be incompatible with such a focused position. The conclusion is that undergoers in de-transitive constructions are neither core arguments nor prototypical obliques.

These facts illustrate that "oblique" in Waray is not necessarily a unitary category. In fact, some linguistic theories posit multiple types of obliques. For example, Role and Reference Grammar (Van Valin 2001) proposes a distinction between "core obliques" vs. "peripheral obliques." Relational grammar (Perlmutter 1980) famously introduced the concept of "chômeur" as a label for a nominal relation that has syntactic properties of neither "terms" (core arguments) nor obliques. While we do not take a stand on either of these theoretical frameworks, we believe they provide some insight into the status of genitive-marked undergoers in Waray. Genitive-marked undergoers are in a pragmatically de-perspectivized grammatical role, and as such lack some syntactic properties of core arguments (ergatives and absolutives) while simultaneously lacking some syntactic properties of prototypical obliques.

3.4 "Control" in participial adjunct constructions

Finally, it has been claimed beginning with Kroeger 1993 that genitive undergoers must be core arguments (direct objects) because they control coreference in certain clause combining constructions in Tagalog. The following examples illustrate this claim (glosses and formatting conventions are those given in Kroeger 1993: 47).

Tagalog:

(15) *Hinuli ng polis ang magnanakaw*
h<in>uli ng polis ang magnanakaw
PERF-catch-OV GEN police NOM thief

nang pumapasok sa bangko.
nang p<um>a~pasok sa bangko
ADV <AV>IMPERF~enter DAT bank
'The police caught the thief entering the bank.'

The question is, which of the two participants mentioned in the first clause of (15) is understood as the participant entering the bank in the second clause. In this example with "Object Voice" (Transitive) marking on the first verb, either the police or the thief may be understood as the participant entering the bank. Example (16) illustrates a similar sequence, but with "Actor Voice" (Intransitive) marking on the first verb and the thief appearing in the genitive case.

Tagalog:

(16) *Nanghuli ng magnanakaw ang polis*
nang-huli ng magnanakaw ang polis
AV.PERF-catch GEN thief NOM police

nang pumapasok sa bangko.
nang p<um>a~pasok sa bangko
ADV <AV>IMPERF~enter DAT bank
'The police caught the thief entering the bank.'

In this example, again, it may be understood that the event expressed in the first clause happened while either the police or the thief were entering the bank. The conclusion is that the thief, even though

expressed as a genitive marked undergoer of the first clause, may still control coreference of the actor of the second clause, and therefore must be a core argument.

The main problem with these examples is that they are not natural. They are obviously elicited, rather than from a Tagalog conversation or text, therefore the coreference relationships are unclear. In particular, the first clause of example (16) implies that there is no particular thief the police caught. As observed by one Tagalog consultant, it is as though the police were out "thief catching." Another mentioned that it was like the police were "catching fish in a tank", as though some thief were there among many others specifically to be caught. The second clause presents a conflicting scene in that it implies some specific person entered the bank, probably the police, but it could be anyone, including possibly some thief. It all depends on the context in which this story is being told.

Our observation for Tagalog and for similar examples in Waray is that these are not syntactic "control" constructions at all. The syntax of the main clause in combination with the second clause neither requires nor precludes coreference between any of the participants. Rather coreference or lack thereof is inferred via the roles and pragmatic statuses of the various participants in the discourse context.

In summary, all four of the major arguments that purport to show that genitive marked undergoers in de-transitive constructions are in fact direct objects are based on faulty data or reasoning. Unfortunately, similar data and arguments have resurfaced in several publications in the past thirty years (e.g., Chen and McDonnell 2019, Hemmings 2021, *inter alia*), thus possibly giving the impression that the "symmetrical voice" hypothesis is established fact.

The more consistent and simpler analysis is that semantically transitive AV constructions are in fact grammatically Intransitive. They constitute a way of downplaying the semantic centrality of the undergoer, according to the perspective of the speaker. Because Waray verbal predicates are overtly marked for Transitivity, this very useful communicative function is elegantly achieved by Intransitive syntax and verbal inflection. No new typological category of symmetrical voice systems or languages is necessary.

4 The typology of Philippine languages

We have not investigated all the languages of the world, but we would guess that all languages include constructions that allow speakers to de-perspectivize the undergoer in a semantically transitive situation in some way. In this section we would like to observe that the morphosyntactic typology of Waray lends itself to expressing such de-perspectivization by overtly marking the verb. Whether or not it is universal, de-perspectivization of an undergoer by de-transitivization is certainly common. Simple examples from English have already been given. Here they are again, with some additions:

(17) a. Irving already ate.
b. We saw, we conquered.
c. She eats pizza.
d. She chewed on the bone.
e. Maradona kicks!
f. Micah shaved.
g. John and Mary embraced.
h. Romeo drank of the potion.

All of these English clauses might be considered "semantically transitive" in that they depict situations that inherently involve activity "transferring over" from a conscious initiator to some undergoer. These transitive situations are expressed in less than fully transitive constructions with the undergoer de-perspectivized in some way. Possible corresponding grammatically Transitive constructions would be:

(18) a. Irving already ate his lunch.
b. We saw Zela, we conquered Zela.
c. She ate our pizza.

d. She chewed the bone.
e. Maradona kicks the ball!
f. Micah shaved himself.
g. John and Mary embraced each other.
h. Romeo drank the potion.

In English, as in many languages linguists are familiar with, de-transitivization as in (17) is mostly accomplished in the expression of the undergoer, either by eliminating it entirely, (17)a, b, e, f, and g, expressing it as generic (17)c, or by placing it in an oblique role, (17)d and h. The verb forms in all the grammatically detransitive constructions in (17) and the corresponding grammatically Transitive constructions in (18) remain the same, no matter whether or how the undergoer is expressed.

However, in Waray, constructions corresponding to (17) would all have to occur with Intransitive verbal morphology (as illustrated in examples 1 through 4 above), whereas those corresponding to (18) would occur in a transitive form. This is consistent with the general typology of most Philippine languages in that much of the functional "work" of indicating the relationship between semantic roles and grammatical relations is accomplished in the verb. Verbs in most Philippine languages tend to be polysynthetic, while noun phrases tend to be much more analytic, with case, number and some pragmatic statuses similar to definiteness or specificity being expressed analytically, rather than morphologically.

There are also typically only three cases in a Philippine language: Absolutive, ergative/genitive and oblique. Therefore, the use of one case form to serve multiple functions is not surprising. In particular, in addition to marking ergative and genitive NPs, the full common NP ergative/genitive case markers also serve to mark de-perspectivized undergoers. In contrast, there are many verb forms that express finely nuanced distinctions in degree of control, effectiveness and relational statuses of the various NPs in a clause. These include inflection for Transitivity and modality, as well as causative and applicative formations (see, e.g., Payne and Oyzon 2020, 2022 and 2024). Most of this functional work is accomplished in the verb rather than the nominal elements in a clause.

5 Conclusion

In this paper we have addressed one part of the controversy over "voice" in Philippine languages. Many questions still remain, but these are well covered elsewhere (see e.g. Payne and Oyzon 2020, 2022, 2023, and Oyzon and Payne in preparation). The main assertion of the present paper is that genitive marked undergoers in Actor Voice constructions are not core arguments (i.e., direct objects), as has been claimed in much of the previous literature, principally works that claim that Philippine languages (usually Tagalog) embody a rare or unique voice system. While Philippine languages are indeed unique and special in many ways, there is no need to posit a typologically rare or unique symmetrical voice system for organizing grammatical relations.

We believe that an appreciation of transitivity as a basic motivating principle of Waray clause structure leads to a deeper understanding of the grammar of Philippine languages, and about language typology, than do previous voice or focus approaches. It is more consistent with what is known from linguistic typology about languages in general, and resounds with the way native speakers use their language. To use a metaphor coined by Nolasco (2018), the transitivity approach is like making shoes that fit Philippine languages, rather than making Philippine languages fit into shoes fashioned for other languages.

List of abbreviations

1	first person
3	third person
ABS	absolutive case
AV	actor voice
CMPL	completive aspect

CONS consistent (as opposed to transitory, a distinction in the common noun absolutive case determiners not particularly relevant to the present paper).
CONT continuing (adverbial particle *pa*)
DAT dative
DEF definite
DEL deliberate mood (a stem-forming prefix *g-*. This analysis is controversial, but again not particularly relevant to the main arguments of the present paper).
DEM demonstrative
DIST distributive
ERG ergative case
GEN genitive case
HAP happenstantial mood
HSY hearsay evidential particle
IMPERF imperfective aspect
INCMPL incompletive particle *la*
INDEF indefinite
INF infinitive
INTR intransitive
IR irrealis
IT iterative
LK linker
LOC locative
NEG negative
NEU neutral (with respect to happenstantial vs. controlled moods)
NOM nominative
OBL oblique
OV object voice
PAST past tense
PERF perfective
PERS personal name
PL plural
PLC pluraction
R realis
REP repetitive
SG singular
TR transitive
TSY transitory
UV undergoer voice

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PAIWAN "NOMINATIVE" AND A-TOPIC OPERATOR

Yosub SHIN
National Tsing Hua University
yosubshin@gapp.nthu.edu.tw

Abstract
This paper aims to account for the Paiwan voice system related with the so-called "nominative" case, and the topic construal of the "nominative" argument as an Aboutness-shift(A-)Topic. To achieve this goal, this paper introduces some previous studies (Aldridge 2004, 2008, 2017; Chen 2017, 2021; Hsieh 2023) of the Philippine-type voice system, points out their issues from the perspective of Minimalist Assumptions (Chomsky 2000, 2001, 2004, 2007, 2008), and suggests a new minimal system supported by empirical data and theoretical relations between the voice system and other constructions, such as relative clauses and *wh*-initial pseudo-cleft constructions. This paper minimally parametrizes the difference between the Philippine-type languages, such as Paiwan, and accusative languages, such as English, by arguing that not only cases, but also (non-)topic features are assigned to the arguments by the canonical case assigners, such as T, *v*, and an applicative head. Furthermore, this paper argues that the topic feature assigned to the pivot must be bound by the A-Topic Operator in Bianchi and Frascarelli's (2010) sense, so that it can be properly construed as a topic (Chang 2000, 2006, 2018) that scopes over the clause.

Keywords: Paiwan, Philippine-type languages, Formosan languages, A-Topic, Minimalist Program
ISO 639-3 codes: map, jpn, kor

1 Introduction

Paiwan exhibits a typical voice system similar to that of Philippine-type languages. In Paiwan, the so-called "subject" is always marked in the "nominative" case,[1] agreeing with the voice markers that are encoded in the verb or the predicate. On the other hand, other non-"subject" arguments are marked in "genitive" or "oblique" in accordance with their base positions. For example, when an external argument, which is an Agent, is marked in the "nominative" case as the "subject", the voice marker infixed to the verb must also be marked in the Actor Voice, whereas the internal argument must be marked in "oblique" (1). When the internal argument is marked in the "nominative" case, then the external argument must be marked in "genitive" with the voice marker of the verb marked in Patient Voice (2).

(1) *'an ta vurati ti zepulj*
<AV>eat OBL potato NOM Zepulj
'Zepulj eats the potato' (Chang 2018:37)

(2) *'<in>an a vurati nimadju*
<PV>eat NOM potato GEN.he
'Zepulj eats the potato' (Chang 2018:56)

[1] In this paper, various kinds of notations for cases will be employed. When a case is enclosed by quotation marks in paragraphs, e.g., "nominative", it refers to the specific type of case of the so-called pivot in the way in which many traditional reference grammars (Chang 2000, 2006, 2018) refer to it. The abbreviated form in the glosses, such as, NOM, or OBL, also refers to the cases in the same way following traditional reference grammars (cf. 1-2). However, when they are not enclosed by quotation marks in paragraphs, e.g., nominative, or they are square-bracketed in the examples, e.g., [Nom], they refer to the cases that are theoretically claimed to be present in Paiwan either by the previous studies of the Philippine-type languages in general, or by this paper.

This pattern is one of the most typical features of Philippine-type languages, and as will be introduced below, many syntactic frameworks have been suggested to account for the mechanisms related to this pattern, behind the voice system of Philippine-type languages. Due to the strong similarities between Philippine-type languages, these frameworks are readily applicable to Paiwan. However, as will be described below, the frameworks are mutually distinct from each other to a surprising degree and based on their own assumptions for their frameworks, which are less independently supported or cross-linguistically attested. Some of them also modify the concepts of the operations or the framework of Minimalist Assumptions so that their theories fit into Philippine-type language data.

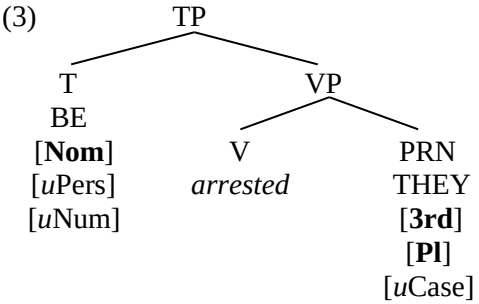
This paper aims to close the distance between previous studies and suggest a new system to understand the voice system and the "nominative" case of Paiwan, and hopefully, of many other Philippine-type languages, in a more minimal way. To achieve this goal, in §2, this paper introduces some basic conceptually necessary Minimalist Assumptions of the tradition of Minimalist Program. In §3, some previous studies regarding the Philippine-type voice system and their limits will be introduced and re-analyzed from the perspective of the Minimalist Assumptions introduced in §2. In §4, this paper combines the plausible arguments of the previous studies and suggest a new system which are empirically supported, yet contained within Minimalist Assumptions. §5 introduces applications of the system suggested in this paper to other types of important syntactic phenomena in Paiwan, which directly and indirectly support the new system. §6 summarizes the paper.

2 Some Minimalist Assumptions

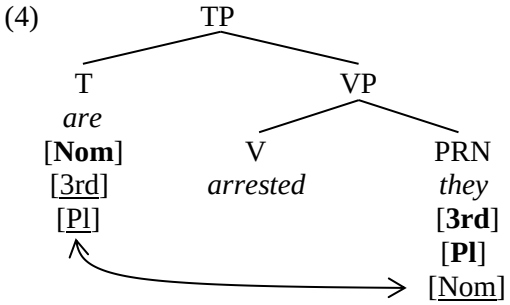
This section briefly explains some Minimalist Assumptions such as Agree, theta-assignments and their relations to each other (Chomsky 2000, 2001, 2004, 2007, 2008). They will make an important role in assessing some of the previous studies of the Philippine-type language syntax and in establishing a new syntactic framework for Paiwan.

In the Minimalist Program, syntax is often defined as an optimal solution for interface requirements, and operations are regarded as tools to satisfy interface requirements. For example, Agree is defined as an operation between one active probe and one or more active goals that value each other's unvalued features, so that they can determine their spell-out forms required by the articulatory-perceptual system. Consider examples (3) and (4). In (3), the T head has a valued case feature [Nom][2] and two unvalued phi-features [*u*Pers] and [*u*Num], whereas the internal argument has the opposite make-up of one unvalued case feature [*u*Case] and two valued phi-features [3rd] and [Pl]. These (un)valued features make the relevant constituents active for Agree, and this is the reason why, in (4), the internal argument can be assigned with nominative and spelled-out as *they*, instead of, say, *them* in accusative. Importantly, these agree relations are established during the syntactic derivations before the spell-out.

(3)



(4)



During the GB-era (Chomsky 1981), theta-roles were believed to be assigned in the D-structure. However, in the Minimalist Program, theta-roles are interpreted from the unambiguous configurations of *v*P-layer by the conceptual-intentional system after spell-out (Chomsky 2007; Gallego 2007; Hale and Keyser 1993). This assumption in the Minimalist Program has been made not only because of the

[2] This paper assumes that case features are uninterpretable tense/aspect features contained in nominals (Pesetsky and Torrego 2001; Svenonius 2001).

absence of D-structure in the framework, but also because of the redundancy of theta-assignment from the perspective of the cross-linguistically observed uniform hierarchy of theta-roles (Baker 1988).

Consequently, Agree and theta-assignments cannot communicate with each other. As explained above, Agree relation is established during the syntactic derivation before the spell-out, whereas the theta-assignments are proceeded by the conceptual-intentional system after the spell-out. For this reason, theta-roles cannot determine or change, for example, the spell-out form of cases. These Minimalist Assumptions may seem trivial, but they play an important role in assessing the possible limits of the previous studies that are introduced below, and in designing a syntactic framework for Paiwan.

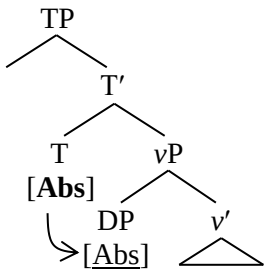
3 Previous studies

In this section, this paper briefly introduces some previous studies of the Philippine-type case system and their possible issues.

3.1 T and v as the absolutive case assigners

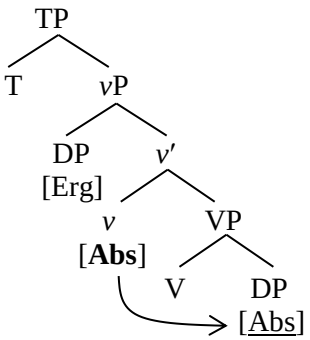
Aldridge's (2004, 2008) syntactically ergative system regards the pivot as absolutive case. In her system, the voice markers are the assigners of absolutive case and are introduced at T or *v*. Specifically, The Actor Voice is introduced at T, whereas the Patient Voice is introduced at *v*, and they assign absolutive case to their closest argument with [*u*Abs] via Agree (cf. §2). For example, in antipassive construction (5), in which the external and internal arguments are both present but the former is marked as the pivot, the Actor Voice is introduced at T, so that it can assign absolutive case to its minimally c-commanded goal, which is the pivot external argument in this case.

(5)

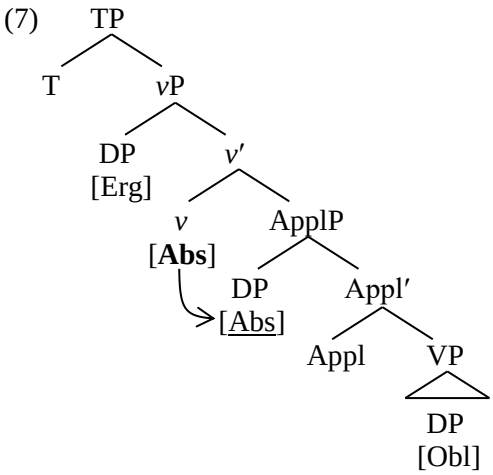


On the other hand, in transitive construction (6), in which the external and internal arguments are both present but the latter is the pivot, the Patient Voice is introduced at *v* instead, assigning absolutive case to the internal argument. The pivot applicative argument is assigned with absolutive case in a similar manner. The applicative argument is introduced at Spec,ApplP (Marantz 1993 and Pylkkänen 2002), but assigned with absolutive case from the Patient Voice at *v*, instead of from the applicative head (7).

(6)



(7)



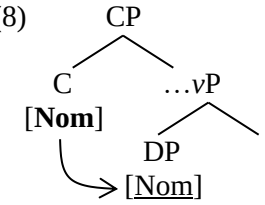
In her system, the Patient Voice is unavailable in unaccusative construction, in which the external argument is absent. This is because her system follows Burzio's (1986) generalization, according to which *v* can assign a structural case if and only if it introduces an external argument. This makes the Actor Voice at T the only possible assigner of absolutive case to the internal argument. According to Aldridge, this is why the non-agent internal argument pivot in unaccusative construction agrees with the "Actor" Voice. Therefore, in her system, the Actor Voice in fact has nothing to do with the Actor or Agent theta-role, but it is just a blind case assigner introduced at T that does not take the actual theta-role into account.

However, this system is based on some stipulations. First of all, many of the non-pivots are assigned with inherent cases in her system. For example, the internal argument of the antipassive construction (5) is assigned with an inherent oblique case from the V head, whereas the external argument of the transitive construction (6) is assigned with an inherent ergative case from the *v* head. In applicative construction (7), both external and internal arguments are assigned with the inherent cases in the same way. This kind of distribution of inherent cases is cross-linguistically less supported. Second, regardless of the types of the relevant cases, all the cases are assumed to be information-structurally symmetrical in her system, whereas some studies argue that absolutive case is related to topicality unlike the other cases (Schachter 1976; Shibatani 1998; Richards 2000, Chen 2017, 2021).

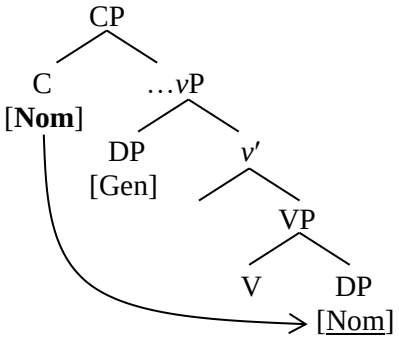
3.2 C / Voice as the only absolutive case assigner

These problems still remain unsolved in her recent system (Aldridge 2017). For example, in her new system, C assigns nominative case, i.e., the absolutive case in her earlier system (cf. §3.1), to the external argument with [*u*Case] via Agree in antipassive construction (8). In transitive construction (9), however, the external argument carries an inherent genitive case instead of [*u*Case], which makes the external argument invisible to C. For this reason, C agrees with the internal argument over the external argument. Although this system may derive the relevant data, the assumptions of such inherent cases potentially undermine her new system.

(8)



(9)

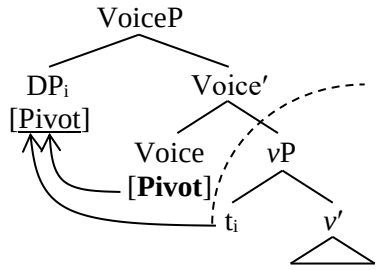


More importantly, this system has another problem. In the earlier system (cf. §3.1), the voice markers were introduced at respective heads, but, in this new system, C is the unique locus of voice markers. If that is the case, it must be assumed that C should be able to "track" and "remember" with which argument it agrees. Specifically, the C head must understand that it agrees with the external argument in the case of antipassive in (8) so that it can be spelled out as the Actor Voice, but with the internal argument in the case of (9) so that it can be spelled out as the Patient Voice. However, such a "remembering" is not usually assumed for Agree (cf. §2).

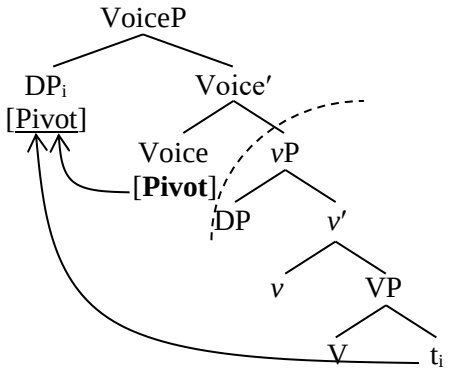
This "remembering" problem is shared by other systems which assume a single head as the unique locus of the voice markers. For example, in Hsieh's (2023) system, one of the arguments within the *v*P-layer is moved to Spec,VoiceP between the IP and *v*P (10) and (11) and assigned with the pivot feature from the Voice head. Subsequently, the Voice head is spelled out as one of the voice markers in accordance with a subset of the properties, such as theta-role or abstract case, of the pivot at Spec,VoiceP (Hsieh 2023:fn.16). However, theta-roles cannot be the determiners of the phonetic forms of the Voice head, since theta-roles are not assigned during the syntactic derivation, but rather interpreted out of the configurations of the *v*P-layer under the Minimalist Assumptions (cf. §2). Abstract

cases may not be the answer either, since abstract cases, such as inherent cases, may complicate the system (cf. §3.1).

(10) Actor Voice



(11) Patient Voice



3.3 Voice markers as agree relations

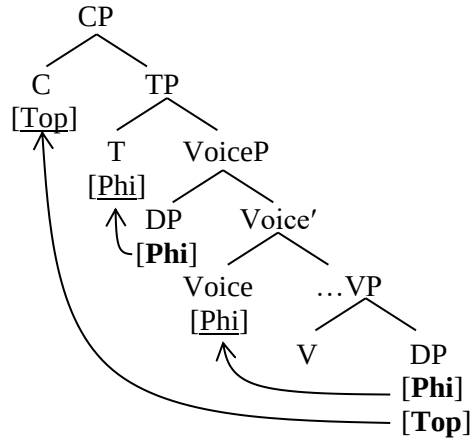
Chen (2017, 2021) neither assumes any inherent case, nor ignores the interpretation of the pivot as a topic. Her system basically follows the Minimalist Assumptions in the case marking. For example, in both antipassive and transitive constructions, external arguments are assigned with nominative from T, whereas internal arguments are assigned with accusative from *v* (her Voice head), like English (cf. §2). However, these nominative and accusative cases are the cases of the non-pivots in Philippine-type languages. In other words, according to her, the Paiwan "genitive" in (2) and "oblique" in (1) correspond to her nominative and accusative cases, respectively. However, once the pivot feature in her system is assigned to, say, an external argument in nominative, the pivot feature overrides the spell-out form of the spell-out form of nominative so that the pivot is spelled out as "nominative" (cf. Table 1). According to Chen (2017: Ch. 5) and many other previous studies, the pivot feature is not a case feature, but a topic feature (see §5 for pivot as a topic). Therefore, pivots and non-pivots are asymmetrically interpreted from the perspective of information structure (cf. §3.2).

Table 1: *Chen's (2017, 2021) combinations of case and topic features*

	Actor Voice	Patient Voice
External argument	Pivot ([Nom] [+Top])	[Nom]
Internal argument	[Acc]	Pivot ([Acc] [+Top])

However, her system still has some issues, unfortunately. First of all, she argues that pivots must agree with the C head and value [*u*Top] of C. For example, as illustrated in (12), the internal argument not only is assigned with accusative case from Voice but also agrees with C to value the [*u*Top] of C. In her system, this kind of double agreement relation is extremely important, since, in her system, the combinations of such agreement relations determine the spell-out form of the voice marker. For example, in (12), it is the internal argument of transitive construction that participates in the double agreement relations with Voice and C. According to Chen, this combination of agreement relations determines the spell-out form of the voice marker as the Patient Voice form. On the other hand, if the external argument with the topic feature establishes such a double agreement relation, then the voice marker is spelled out as the Actor Voice. However, the articulatory-perceptual system is usually assumed to be blind to such a syntax-internal Agree. In other words, Chen's system also has the "remembering" problem discussed earlier (cf. §3.2). Furthermore, although Chen regards the pivot argument as a topic, the agreement between the C head and the pivot as in (12) does not necessarily indicate that the topic is interpreted in the clausal left periphery as a topic. In other words, the agreement relation does not clearly describe how, say, the topic-comment relation is established between the pivot and the rest of the clause.

(12)



4 A minimal voice system

4.1 Understanding (non-)topical arguments

In Aldridge's (2004, 2008, 2017) systems, absolutive case of the pivot is symmetrical to the other cases of non-pivots in that they are not distinguished from each other from the perspective of information structure (cf. §3.1-2). However, as previously mentioned, the "nominative" case has been regarded as the topic of the sentence in many previous studies (Schachter 1976, 1996; Chen 2017, 2021). Therefore, this paper adopts Chen's (2017, 2021) case system in this paper and assumes that the Paiwan "genitive" and "oblique" cases are structural nominative and accusative cases and that the pivot feature is in fact a topic feature that overrides the spell-out form of nominative and accusative into "nominative" (cf. §3.3). However, Chen's case system still needs to be slightly modified. Chen in fact treats the "nominative" case differently from the other cases in that it is a special case that contains one more feature, i.e., the topic feature that the other non-pivot cases do not (13a, b).

(13) a. NOM:[+Top] [Nom]
b. GEN: [Nom] (Chen's (2017, 2021) system)
c. GEN: [-Top] [Nom] (This paper)
d. OBL: [-Top] [Acc] (This paper)

However, this paper suggests that the correct formal representation of the Paiwan "genitive" should be as in (13c). This idea can be supported in two ways. First of all, theory-internally, what (13b) refers to in fact does not logically equal to (13c). Under the assumption that the topic feature is compatible with [Nom], (13b) means [±Top] [Nom], rather than [-Top] [Nom], whereas Chen actually tends to refer to the latter. Second, theory-externally, "genitive" and "oblique" necessarily indicate that they are not the pivot of the relevant sentence. In other words, "genitive", for example, is in fact as information-structurally meaningful as "nominative" in that it indicates that it is never a pivot. Therefore, (13c), not (13b), should be the correct representation of "genitive", since (13b), contrary to the fact, allows "genitive" to function as another pivot. Therefore, this paper will treat the non-pivot cases like (13c, d). This case system still captures Chen's (2017, 2021) information-structurally asymmetrical interpretation of pivots and non-pivots. Table 2 more specifically illustrates how the Paiwan "cases" will be understood in this paper.

Table 2: *Combinations of case and topic features assumed in this paper*

	External Argument	Internal Argument
Pivot	[+Top] [Nom] "Nominative"	[+Top] [Acc] "Nominative"
Non-pivot	[-Top] [Nom] "Genitive"	[-Top] [Acc] "Oblique"

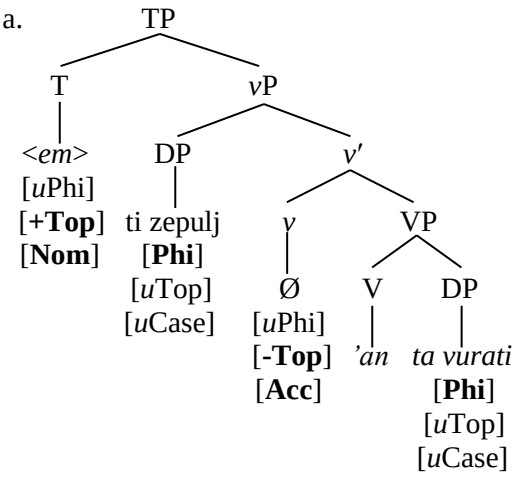
4.2 Voice markers as assigners of case AND (non-)topic features

Chen (2017, 2021) argues that the spell-out form of voice markers is determined by combinations of agree relations, but this triggers the "remembering" problem (cf. §3.3). Also, her system does not account for by what and how [+Top] is introduced to the pivot; [+Top] is probed and agreed by C, but not assigned by C to the pivot (12); in other words, [+Top] is described as if it is already introduced to the pivot from the beginning of the derivation. However, these problems can be solved by minimally arguing for an unvalued topic feature for arguments, and valued topic features for T and *v* in Paiwan.

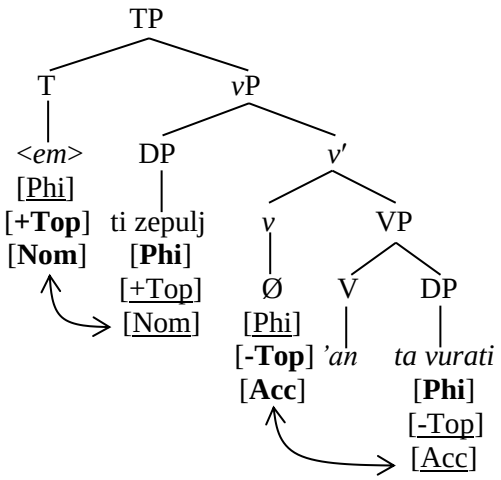
The core arguments are as follows. Paiwan DPs contain not only [*u*Case], but also [*u*Top], whereas DPs of accusative languages only contain [*u*Case]. On the other hand, Paiwan T and *v* contain valued topic and case features. T and *v* respectively have [Nom] and [Acc] à la Chen, but both can have either [+Top] or [-Top]. Consequently, Paiwan has four kinds of T and *v* heads in total. The T head with [+Top] is spelled out as the Actor Voice, whereas the *v* head with [+Top] is spelled out as the Patient Voice like Aldridge's (2004, 2008) voice markers (cf. §3.1). Both T and *v* are spelled out as null morphemes if they carry [-Top]. In this way, the Philippine-type voice marking can be accounted for without assuming any inherent cases. Consider the following structures for example:

(14) *'an ta vurati ti zepulj*
<AV>eat OBL potato NOM Zepulj
'Zepulj eats the potato' (Chang 2018:37)

a.



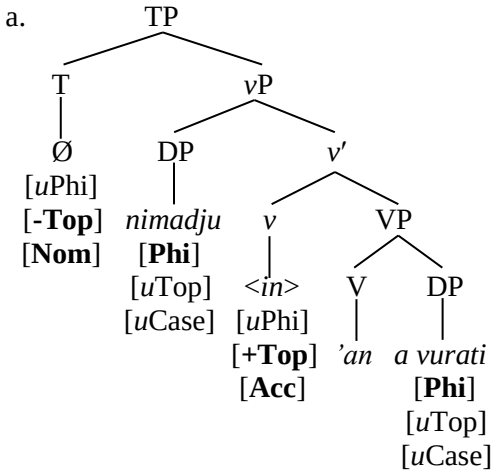
b.



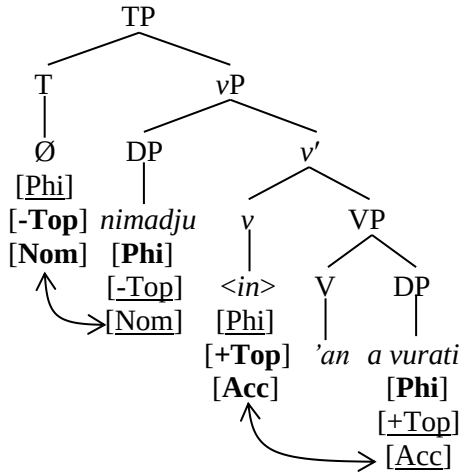
As illustrated in (14a), the external and internal arguments participate in the derivation not only with an unvalued case feature, but also with an unvalued topic feature. On the other hand, T and *v* have valued topic and case features. In this particular example, T has [+Top] whereas *v* has [-Top]. These make them spelled out as the Actor Voice marker and a null morpheme, respectively. T, in accordance with the Minimalist Assumptions, assigns [Nom] and [+Top] to the external argument (14b). This leads the external argument to be spelled out as "nominative" (cf. Table 2). The same relation also holds between *v* and the internal argument, but the internal argument is assigned with [-Top] in (14). For this reason, its case is spelled out as "oblique" (cf. Table 2). Let us consider an example of transitive construction (15):

(15) *'<in>an a vurati nimadju*
<PV>eat NOM potato GEN.he
'Zepulj eats the potato' (Chang 2018:56)

a.



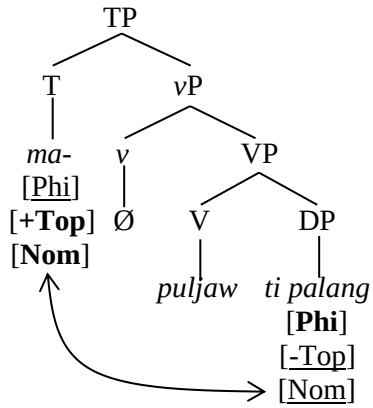
b.



In this example, the opposite result of (14) is derived. In this case, T has [-Top], which makes it a null morpheme. On the other hand, *v* is spelled out as the Patient Voice due to [+Top]. The external argument is spelled out as "genitive" since it contains [Acc] and [-Top], whereas the internal argument is spelled out as "nominative" since it contains [Nom] and [+Top] (cf. Table 2).

This line of argument accounts for why the internal argument of the unaccusative and stative constructions agrees with the Actor Voice. Under the Minimalist Assumptions (cf. §2), *v* can be active only if it is a strong phase head, which introduces the external argument. In unaccusative and stative constructions, *v* must be weak and therefore inactive, making the T head the only possible case and topic assigner as described in (16):

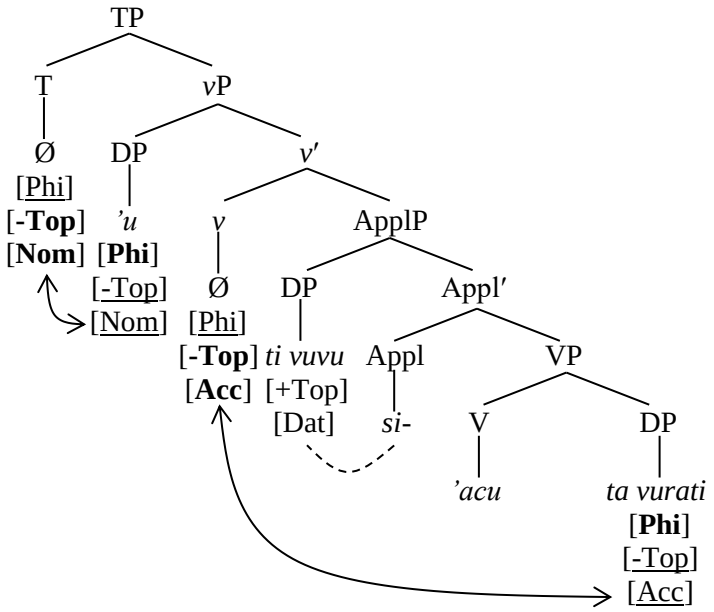
(16) *ma-puljaw-anga ti palang*
AV-drunk-PRF NOM Palang
'Palang got drunk' (Chang 2000:96)



In this sense, this new system is reminiscent of Aldridge's (2004, 2008) earlier system (cf. §3.1). However, this system is not assuming any inherent cases for the core arguments, unlike Aldridge's system, to make T assign nominative case to the internal argument across the inactive ergative external argument (cf. 9). In this system, all the cases are assigned by T and *v* in the standard way, but along with the (non-)topic features.

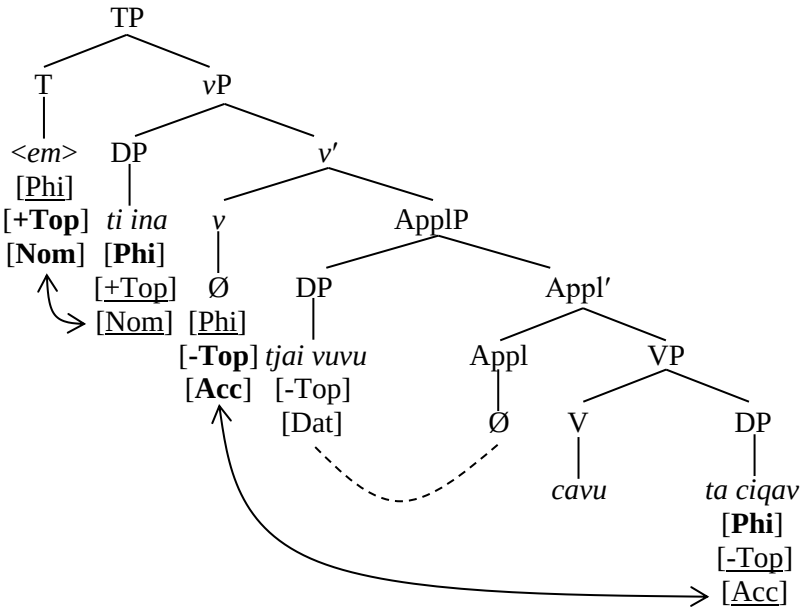
Nonetheless, this does not mean that this system is closed to any cross-linguistically attested inherent cases; it still welcomes any types of inherent cases that are cross-linguistically supported. For example, applicative arguments are often related with inherent cases such as dative (Cuervo 2008). This paper holds exactly the same position in regard to Paiwan applicative arguments: they are assigned with inherent dative by the applicative head, for example, in the case of benefactive. However, in addition, [±Top] is also inherently assigned by two different kinds of applicative heads along with the inherent dative case. For example, consider the following example:

(17) *'u-si-'acu* *ta* *vurati* *ti* *vuvu*
I.GEN-IV-bring OBL potato NOM grandmother
'I bring potatoes for my grandmother' (Chang 2018:64)



In this example, the pivot applicative argument *ti vuvu* 'the grandmother' carries the inherent dative case and an inherent topic feature, which spells out the case marker as "nominative" in the same manner as (15-16). These inherent features are of course licensed by the applicative case *si-*. In the relevant example, neither T nor *v* assign [+Top], which makes them null morphemes. In addition, *v* agrees with the internal argument *ta vurati* 'the potato', not with the applicative argument, since the applicative argument is not active for Agree (cf. §2). The inherent topic feature can also be [-Top]. In this case, it is licensed by another applicative head, which is null, as are the T and *v* heads in (17).

(18) *na-cavu-cavu* *ta* *ciqav* *tjai* *vuvu* *ti* *'ina*
PRF-RED<AV>-wrap OBL fish OBL grandfather NOM mother
'My mother always wraps fish for my grandfather' (Chang 2018:75)



In (18), the benefactive applicative argument *tjai vuvu* 'the grandfather' is marked in "oblique" since [-Top] does not override the spell-out form of the case. Although the inherent case is dative, but it is spelled out as "oblique", like English dative spelled out as accusative. In Saisiyat, the applicative argument is marked in "dative", a distinct case (Yeh, 2018), supporting this current argument. As mentioned above, the applicative head that licenses [-Top] [Dat] is null and, instead, T assigns [+Top] [Nom] to the external argument in the relevant example (18).

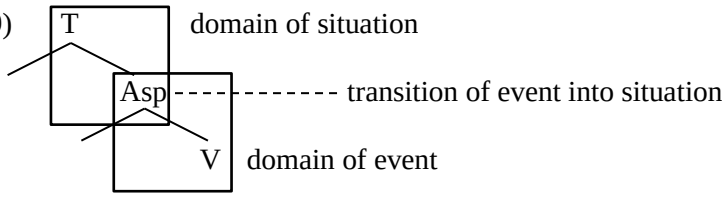
In a similar manner, Locative Voice in Paiwan can also be accounted for although this matter will not be discussed here for brevity. Consequently, the Paiwan voice system can be accounted for without assuming any additional inherent cases that are not cross-linguistically supported. Voice markers do not have to be determined by bundles of agree relations either. This system does not necessitate any additional A-movement of pivots to a specific position, such as Spec,VoiceP, for the assignment of the pivot, or, topic feature. Instead, the reason why the voice markers seem to agree with the theta-roles of the pivot, which is impossible under the Minimalist Assumptions (cf. §2) is straightforward; this is possible due to the minimal differences between, say, English and Paiwan, in which the case assigners assign not only the cases, but also the topic features.

4.3 Supporting data

4.3.1 Paiwan-internal data: the aspect marker

Of course, T and *v* are not sufficient for describing all the syntactic phenomena in Paiwan; for example, more functional heads such as aspect head must be postulated as this system develops. According to Ramchand and Svenonius (2014), the *v*P-layer is the domain of events in which arguments are introduced, whereas the TP-layer is the domain of situations in which the events of *v*P are anchored to various kinds of temporal points. One of the most important functional heads in the TP-layer, in their system, is the aspect head (19). In their system, it is the first functional head that anchors an event to a temporal point, yielding a situation. The T head, which takes the AspP as the complement, further introduces other kinds of temporal points, such as the reference time.

(19)



Interestingly, Paiwan also seems to have the structure (19), in which T and *v* are still the case/topic feature assigners, intervened by an Asp head. As described below, all the Paiwan non-actor voice markers contain infix <*in*> in perfect aspect, whereas the actor voice does not:

(20) *na-**migacalj** i-vavav ta qaciljay a 'edrian*
PRF-stand.**AV** be-above OBL rock NOM child
'The child stepped on the rock' (Chang 2018:62)

(21) *'u=p<**in**>uljat-anga a 'u=cengel*
I.GEN=all<PV.**PRF**>-already NOM my=lunch
'I already finished my lunch' (Chang 2018:63)

(22) *na-s<**in**>i-cavu ta ciqav ti vuvu ni 'ina*
PRF-IV<**PRF**>-wrap OBL fish NOM grandfather GEN mother
'Mother has wrapped the fish for the grandfather' (Chang 2018:72)

Interestingly, in Distributed Morphology (Halle and Marantz 1993; Marantz 1994; and Embick and Noyer 2007), suppletions are analyzed to occur between two adjacent heads (Bobaljik 2012, 2017), such as the T and Asp heads (19). In other words, the higher head, i.e., T, determines the allomorph of

the lower head, i.e., Asp. In the system of this paper, the Actor Voice ([+Top] [Nom]) is introduced at the T head, and the other voice markers are introduced at different heads (cf. §4.2). When the other heads are the voice markers, the T head assigns [-Top] [Nom] (15). Consequently, the Asp head is adjacent to the Actor Voice that assigns [+Top] [Nom] in (20), whereas it is adjacent to the other type of T that assigns [-Top] [Nom] in (21-22). If the [+Top] T head determines the spell-out form of the Asp head as null, whereas the [-Top] T head determines it as the infix *<in>*, then it can be successfully accounted for why Paiwan exhibits the two-fold spell-out of the perfect aspect that patterns with the voice markers.

4.3.2 Paiwan-external data: Puyuma

In fact, the structure (19) is observed not only in Paiwan, but also in Puyuma. Puyuma anti-agentive construction regularly refuses agent-oriented constituents, such as agent-denoting *by*-phrases, agent-oriented adverbs, and purpose clauses (Chen 2022:532). According to Chen, the verb of the anti-agentive construction must be attached with two prefixes: the Actor Voice *m-* and the deficient Voice marker *u-*, which marks the absence of the agent external argument. Based on the following data, interestingly, Chen explains that the grammatical aspect is positioned between the former and the latter:

(23) a. Vowel-initial stems
u<a>arak 'be dancing'
i<a>natray 'going to die'
i<a>edreng 'be sleeping'
i<a>walak 'being pregnant'

b. Consonant-initial stems
s<a>-senay 'be singing'
d<a>-deru 'be cooking'
k<a>-kawang 'be walking'
g<a>-garatr 'be biting'

(24) a. *m-u<a>disdis* 'being torn'
b. *m-u<a>lriyus* 'turning around'
c. *m-u<a>deru* 'being roasted/cooked'
d. *m-u<a>atel* 'being falling'

According to Chen, the progressive aspect *<a>* reduplicates the initial consonant of the stem to which it is attached (23b), whereas it does not when attached to a vowel-initial stem (23a). Interestingly, the progressive aspect *<a>* never reduplicates the initial consonant of the stem (24), strongly indicating that it is not directly attached to the stem in the relevant examples, but to a constituent attached with the deficient Voice marker *u-*. In other words, *<a>* is not introduced after the introduction of the Actor Voice *m-*. If that was the case, the surface form of, for example, (24a) would be **ma-m-u-disdis*. Based on these data, Chen argues that the Actor Voice marker *m-*, the progressive aspect *<a>*, and the deficient Voice marker *u-* form a syntactic hierarchy in accordance with the Mirror Principle (Baker 1985).

Interestingly, the last subsection (cf. §4.3.1) has already derived the T-Asp-*v* structure in Paiwan (19-22) that is compatible with her conclusion. In the system in this paper, the Actor Voice is introduced at the T head and Chen's deficient Voice head is traditionally regarded as the so-called weak *v* in Minimalist Program. Therefore, under the plausible assumption that the Actor Voice *m-* and the deficient Voice marker *u-* are respectively introduced at T and *v* also in Puyuma, the system in this paper can also account for Puyuma anti-agentive construction, cross-linguistically supporting the argument in §4.3.1.

4.3.3 Paiwan-external data: Tsou

Tsou provides even stronger evidence. As described in the following data, Tsou has two voice markers per clause, the higher voice marker, which changes its form in accordance with present tense and past tense, as in (25) and (26), and the lower voice marker that is marked by verbs or affixes as in (25) to (28). The former is marked in Actor Voice when the verb is also marked in Actor Voice (25), whereas it is marked in Non-actor Voice when the verb is marked in any other voice in (27) and (28).

(25) ***mi-****ta* *seolxa* *no* ***i'upu*** *ta* *meesi*
AV.PRS-he right.now LNK participate.**AV** OBL festival
'He is participating in the festival right now' (Chang and Pan 2018:58)

(26) ***moh-****ta* *la* ***maleo*** *ne* *auyusi*
AV.PST-he HAB deceptive.**AV** OBL before
'He was deceptive before' (Chang and Pan 2018:124)

(27) ***os-****'o* *teih-**a*** *to* *evi* *'o* *y3-'u*
NAV-I hang-**PV** OBL wood NOM cloth-my
'I hung my cloth on the tree' (Chang and Pan 2018:51)

(28) ***os-****'o* *haf-**neni*** *ta* *f'ue* *'e* *ba'i*
NAV-I bring-**IV** OBL potato NOM grandmother
'I bring some potatoes for my grandmother' (Chang and Pan 2018:54)

In the system of this paper, T is either Actor Voice [+Top] [+Nom] or Non-actor Voice [-Top] [+Nom], as in (14) and (15), which respectively correspond to the Tsou examples (25) to (28). When T is Non-actor Voice, either *v* or an applicative head must introduce at least one voice marker in Paiwan in (15) and (18), akin to Tsou examples (27) and (28). Furthermore, as discussed above (§4.3.1-2), the aspect head, e.g., *la* HAB (26), is positioned between T and *v* in Tsou. Therefore, Tsou, along with Puyuma (cf. §4.3.2), also supports the voice system in this paper.

4.4 Interim summary

In this section, this paper suggested a new voice system in which T, *v* and applicative heads assign [±Top] to arguments along with cases. This system symmetrically accounts for why pivot arguments are interpreted as sentence topic whereas the others are not. This system assumes neither cross-linguistically less supported inherent cases, additional A-movements, nor spell-out of voice markers that "remember" the process of the whole derivations (cf. §3). In this way, not only Paiwan, but also Puyuma and Tsou voice systems can be accounted for. Considering the fact that many Philippine-type languages have highly similar voice systems, this system can also be regarded as a language-neutral model for the Philippine-type voice system.

5 Topic-construal of the pivot

Chen (2017, 2021) argues that C agrees with pivots with [+Top], but as mentioned above (cf. §3.3), this does not clearly explain how pivots can scope over the whole clause. Also, the voice system discussed in the last section alone does not prevent, for example, T and *v* from assigning [+Top] to the external and internal arguments simultaneously within a single clause, which is not allowed in Paiwan.

5.1 The pivot as the A-Topic

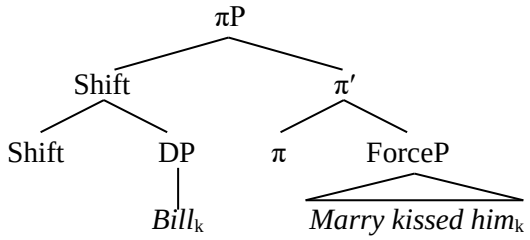
To solve these two seemingly unrelated problems, this paper suggests that pivot is the variable of an Aboutness-shift Topic, which functions as an aboutness-shift operator (Bianchi and Frascarelli 2010. Bianchi and Frascarelli (henceforth B&F) mainly discuss three types of topics: Aboutness-shift(A-)Topic, Contrastive(C-)Topic and Given(G-)Topic. A-Topic newly proposes or reintroduces a topic in the discourse as a sentence topic in Reinhart's (1981) sense. A sentence topic is the entity that the sentence is about. English Left Dislocation (LD) and some of the Italian Clitic Left Dislocation (CLLD) are some constructions for A-Topic marking. B&F explain that A-Topic must be positioned higher than ForceP based on the fact that it is not influenced by illocutionary force (29). On the other hand, C-Topic, which is mainly implemented by topicalization with no resumptive pronoun unlike LD examples as in (29), is sensitive to illocutionary force as in (30).

(29) a. *This book, leave it on the table!* (imperative)
b. *Those petunias, did John plant them?* (interrogative)
c. *Those petunias, when did John plant them?*

(30) a.**This book, leave on the table!* (imperative)
b.**Those petunias, did John plant?* (interrogative)
c.**Those petunias, when did John plant?*

Furthermore, A-Topic is not recursive. Adopting Krifka's (2001) suggestion, B&R (2010:63) attribute the uniqueness of A-Topic to its function as a speech act that introduces a "card" representing an entity under which the asserted proposition is stored. According to B&R, G-Topic resumes given background information, which is not necessarily the sentence topic (B&R 2010:57–59), whereas A-Topic may introduce a new, ungiven sentence topic (B&R 2010:55). G-Topic is also distinguished from A-Topic in that it is recursive in contrast to A-Topic (see B&R 2010:59 for the relevant examples). To account for these syntactic properties of A-Topic, B&R suggest (see 31) in which the A-Topic is introduced over the ForceP as an aboutness-shift operator that licenses *Bill* as the A-Topic and binds the resumptive pronoun *him* embedded in the ForceP. As mentioned above, A-Topic is a speech act to them, and the π head is a speech act conjunction. Therefore, (31) represents two speech acts: an introduction of a sentence topic and an assertion about it.

(31)



Chang (2006: Ch. 14.3.3), along with many other previous studies about the nature of the Philippine-type language pivot (Schachter 1976, 1999), suggests that the topicality is the primary property that defines the Paiwan pivot. Interestingly, the pivot is neither recursive nor contrastive, indicating that it is neither G-Topic nor C-Topic. In fact, it behaves like A-Topic in many aspects. First of all, as mentioned above, it is not recursive; a single sentence cannot contain two pivots simultaneously. Second, not only do pivots resume a given sentence topic (see Chang 2006:397–398 for an example of a series of sentences that share a single sentence topic throughout the whole narration), but also introduce a new, indefinite topic (32) as B&R's A-Topic does. Third, like the English examples, as shown in (29), pivot is not influenced by illocutionary force, as per (33).

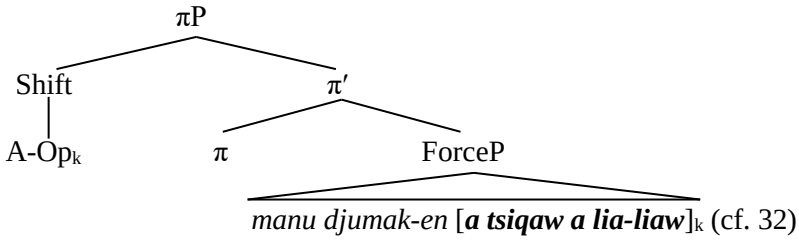
(32) *manu djumak-en* ***a tsiqaw a lia-liaw***
then find-GV **NOM fish LIN RED-many**
'She found **a lot of fish**' (Chang 2006:394)

(33a) *saneljaceng-an a icu a siqunu* (imperative)
cut.vegetable-IV NOM this LIN knife
'Cut the vegetable with this knife!' (Chang 2018:84)

(33b) a *qau-qau-ng a su-alja'* (interrogative)
Q cry<AV>-PROG NOM you.GEN-kid
'Is your kid crying?' (Chang 2018:100)

Consequently, Chang's (2006) pivot as a topic is most likely to be B&R's A-Topic. Based on these facts, this paper suggests a null version of B&R's aboutness-shift operator (henceforth, A-Operator) that is introduced over the ForceP and binds the in-situ pivot with [+Top], as in (34), so that it can be interpreted as the sentence topic and functions as a sentential operator.

(34)



In this way, the sentence topic construal of the pivot can be accounted for. (34) also explains why multiple pivots are impossible in Paiwan; the uniqueness of the pivot is reduced to the uniqueness of A-Topic, in other words, the uniqueness of the null aboutness-shift operator as B&R describe.[3]

5.2 Extended arguments

5.2.1 Austronesian Extraction Restriction

The A-Operator construction suggested in this paper in (34) offers a new perspective to analyze some other well-known phenomena. First of all, many Philippine-type languages including Paiwan have the restriction that the head of the relative clause must be the pivot of the relative clause, agreeing with the voice marker as in (35). This restriction is often referred to as the Austronesian Extraction Restriction.

Aldridge (2017) and Hsieh (2023) account for this restriction in a structural way. For example, in Hsieh's system, the pivot moves to Spec,VoiceP for the pivot feature, as per (10) and (11), and the Voice head functions as a phase head, which makes the pivot the only extractable argument. According to his theory, *a za vales* 'that axe' in (35) must have been extracted from the bracketed relative clause. As the head of the relative construction is marked as a "nominative" element in (see 35), this extraction theory seems to work well. However, (36) directly challenges this extraction theory. If the underlined matrix internal argument *tjay cemedas* in (36) had been extracted from the relative clause, it must have been marked as "nominative" in Hsieh's system, contrary to the fact. Furthermore, in (37), the relative head *na za* is marked in "genitive" whereas it's the clause-internal relative head *a vavayan* is marked in the "nominative" case agreeing with the voice marker. (38) is far more interesting; the relative clause itself is marked in "oblique" whereas the head is embedded in the relative clause, similar to (37). Unfortunately, no extraction theory that literally extracts the pivot of the relative clause out of the relative clause seems to be able to derive as various patterns of the Paiwan relative clauses as this. Furthermore, extraction theories must also account for how such extractions are exempt from the theta-criterion and allowed to have two cases, one from the embedded clause and the other from the matrix clause.

(35) *madjilang-anga**a*** ***za*** ***vales*** *a* [***s***<*in*>***i***-*vales* *ni* *palang*]
rusty-PRF **NOM** **that** **axe** LIN **IV**<PRF>wield GEN Palang
'The axe Palang wields got rusty' (Chang 2000:154)

(36) *tjengLay ti palang tjay cemedas a* [*na-k*<***em***>*eLem tjay kalalu*]
like NOM Palang OBL Cemedas LIN PRF-hit<**AV**> OBL Kalalu
'Palang likes Cemedas who hit Kalalu' (Chang 2000:155)

(37) *'elem-en ti kai na za* [*'*<***em***>*esa-'esa* ***a*** ***vavayan***]
hit-PV NOM Kai GEN that RED<**AV**>-cook **NOM** **woman**
'The women who is cooking hits Kai' (Chang 2018:130)

[3] Although it will not be discussed further for brevity, the binding relation also seems to be possible between two copies of one pivot. For example, only pivots can undergo topicalization (Chang 2018:40), but this restriction can be regarded as a result of the binding relation between two copies of a single pivot.

(38) *tjengelay=a'en* *ta* [*su=v<**in**>eli* ***a*** ***laqulj*** *tatiav*]
like=I.NOM OBL you.GEN=buy<**PV**> **NOM** **book** yesterday
'I like the book you bought yesterday' (Chang 2018:129)

Therefore, what is undeniable for now is that the voice marker within the relative clause must agree with the relative head. A simpler way to account for (35) and (36) is to regard the clause-external heads, *a za vales* 'that axe' as in (35) and *tjay cemedas* as in (36), as modificands base-generated outside the relative clause, not extracted from the relative clause. In this way, why *tjay cemedas* in (36) can be marked in a non-"nominative" case can be accounted for; it can be marked in "oblique", since it has never been assigned with "nominative" in the relative clause in (36).

However, this still does not explain why, for example, the voice marker embedded in the relative clause seems to agree with the clause-external relative head *tjay cemedas* in (36). This suggests that it actually does not agree with *tjay cemedas* in (36), but with a pro, which is the pivot of the relative clause as are the overt clause-internal relative heads, i.e., *a vavayan* 'the woman' in (37) and *a laqulj* 'the book' in (38). Paiwan is a pro-drop language, which makes it absolutely natural that clauses do not have any overt pivot. Presence of a pivot pro, by definition, necessitates an A-Operator for the pivot in (34) in the relative clause. Based on this inference, this paper suggests that this A-Operator also functions as a relative operator, which corresponds to English *which*, *who*, and *what*. The head-internal examples (37) and (38) are accounted for in the same way; the only difference between (35) and (36) versus (37) and (38) is that the pivots are covert in the former, whereas overt in the latter. Consequently, the structures of (35) and (38) can be described as in (39a-d) in a uniform manner.

(39a) ***a*** ***za*** ***vales***$_i$ *a* [**A-Op**$_i$ ***s***<*in*>***i***-*vales* *ni* *palang* **pro**$_i$] (for 35)
NOM **that** **axe** LIN **IV**<PRF>wield GEN Palang

(39b) ***tjay*** ***cemedas***$_i$ *a* [**A-Op**$_i$ *na-keLem* **pro**$_i$ *tjay* *kalalu*] (for 36)
OBL Cemedas LIN PRF-hit<AV> OBL Kalalu

(39c) *na* *za*$_i$ [**A-Op**$_i$ *'<**em**>esa-'esa* ***a*** ***vavayan***$_i$] (for 37)
GEN that RED<**AV**>-cook **NOM** **woman**

(39d) *ta* [**A-Op**$_i$ *su=v<**in**>eli* ***a*** ***laqulj*** *tatiav*] (for 38)
OBL you.GEN=buy<**PV**> **NOM** **book** yesterday

The relations and similarities between A-Topics and relative pronouns have been discussed by many previous studies. For example, Erteschik-Shir (1997, 2007) explains that the function of relative pronouns is to set the relative head, which is co-indexed with the relative pronoun, as a "card" under which the proposition of the relative clause is stored, similar to the function of B&R's A-Topic (cf. §5.1). Chomsky (1977) also emphasizes the similarity between topic-comment relations and relative clauses. Also, from the perspective of individual languages, A-Topics are not embeddable in Japanese (Kuno 1976) and Korean (Bak 1984), which is arguably due to competence between A-Topics and relative operators. From the perspective B&R's study, A-Topics and relative operators are neither recursive nor contrastive. Furthermore, though not language-universal, some relative constructions in some languages allow resumptive pronouns for the resultative pronoun, as in (40).

(40) *ha-yeled* [***še***-*imo* *mefaneket* ***oto*** *kol* *ha-zman*] *me'od* *mefutax*
the-boy **that**-mother.his spoils **him** all the-time very developed
'The boy that his mother spoils all the time is very developed' (Erteschik-Shir 2007:92)

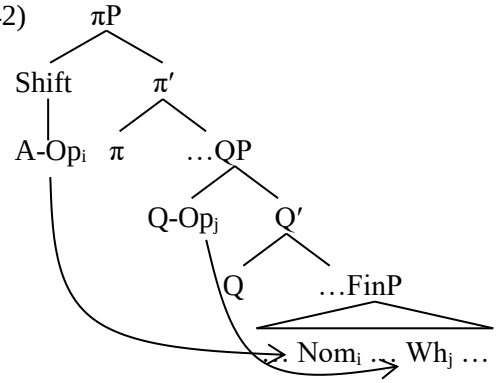
Also, relative constructions in non-Philippine type languages consist of three constituents: clause-external relative head, relative operator, and the variable for the relative operator, like the Paiwan structures with three constituents, i.e., clause-external relative head, A-Operator, and pivot (39). Based on these similarities between the two, relative constructions can be safely regarded as an embedded A-Operator construction.

5.2.2 Relativized Minimality effect

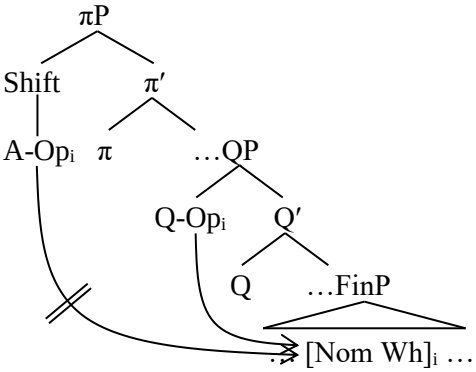
Paiwan exhibits an interesting distribution of *wh*-arguments. According to Chang (2000), Paiwan non-"nominative" *wh*-arguments stay in-situ (41), whereas "nominative" *wh*-arguments must appear in the sentence-initial position. To account for in-situ *wh*-arguments, this paper adopts Tsai's (1999; 2008) unselective binding approach to *wh*-in-situ languages and suggests that Q-Operator in the left periphery unselectively binds in-situ *wh*-arguments as illustrated in (42).

(41) *marekutj-esun* ***tjay*** ***ima***
afraid.of-you.NOM **OBL** **who**
'Who are you afraid of?' (Chang 2000:124)

(42)



(43)



In (42), the pivot and the in-situ *wh*-argument are respectively bound by the A-Operator (cf. 34) and the Q-Operator, forming two mutually distinguished binding relations. However, as mentioned above, pivot *wh*-argument must be sentence-initial. This paper attributes this to the Relativized Minimality effect triggered by the double binding relations on a single constituent. As illustrated in (43), when it stays in-situ in the canonical A-position, the pivot *wh*-argument must be simultaneously bound by the A-Operator and the Q-operator, violating the Relativized Minimality (Rizzi 1990:25-27). This makes in-situ pivot *wh*-arguments impossible in Paiwan and also in many other Philippine-type languages.

(44) ***ti*** ***ima*** *a* *'<in>elem nimadju*
PRED **who** NOM <PV>hit he.GEN
'Who will come here?' (Chang 2018:107)

(45) A-Op$_i$ Q-Op$_j$ [$_{\text{Predicate}}$ *ti* *ima$_j$*] [$_{\text{Subject}}$ *a* [A-Op$_k$ *'<in>elem* *pro$_k$* *nimadju*]]$_i$
PRED who NOM <PV>hit he.GEN

As for sentence-initial *wh*-arguments as in (44), it can be analyzed as in (45) following Tsai's (2003; 2015) analyses of the relevant construction as a pseudo-cleft construction in Formosan languages. In (45), the internal argument of *'<in>elem* '<PV>hit' is relativized, forming a free relative structure comparable to (39d). This free relative clause, not the pro within the relative clause, functions as the pivot of the matrix clause. In other words, it is marked in the "nominative" case and bound by the matrix A-Operator. On the other hand, the *wh*-expression *ima* 'who' is no longer an argument, but a predicate in a pseudo-cleft structure. For this reason, it is successfully bound by the Q-operator, without violating the Relativized Minimality.

6 Conclusion

The basic Paiwan voice system can be accounted for by simply assuming that [±Top] is assigned by the T, *v*, and applicative heads to arguments along with standard case features (cf. §4) and that A-Operator licenses pivots as an A-Topic (cf. §5). This new system is based on various kinds of fundamental ideas of the previous studies discussed in this paper, but it adopts only some of those ideas that are conceptually necessary, in other words, not stipulative, in order to keep itself as minimal as possible

under the Minimalist Assumptions (cf. §2). This system will not only help in understanding the Paiwan voice system but also in minimally parametrizing the differences between Philippine-type languages and non-Philippine-type languages.

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THE OBJECT MARKER OF HEIMA LALO

Xingyue WANG
Kobe City University of Foreign Studies
xingyue664 AT gmail DOT com

Abstract

This paper provides an overview of object marking in Heima Lalo, a Lolo-Burmese language of the Tibeto-Burman family. Based on the author's firsthand data, this paper reveals that the object marking in Heima Lalo differs from the one documented in previous research. In addition, it should be noted that there is a generational variation in the use of object markers: the younger generation (primarily individuals in their 20s) tends to use *ɣə²¹*, whereas the older generation (those over 30) predominantly employs *li²¹*. In Heima Lalo, the object markers are used for patient marking only in contexts where semantic ambiguity may arise, particularly in relation to the animacy hierarchy. In other words, the object markers occur optionally, being utilized in a particular context. The basic constituent order of Heima Lalo is APV (Agent-Patient-Verb), though in some cases the patient may be fronted, resulting in a PAV structure. In sentences with passive-like constructions, the patient may appear at the beginning of the sentence without overt case marking, while the agent is marked with *khə³³*. This paper provides a more detailed analysis of object marking in Heima Lalo, with special reference to these patterns of variation and their implications.

Keywords: object marker, animacy hierarchy, Lalo, syntax
ISO 639-3 codes: lalo1240

1 Introduction

Lalo (ISO 639-3 ywt glottocode: lalo1240) is a variety of Loloish, a language belonging to the Central Lolo language of the Lolo-Burmese branch of the Sino-Tibetan Tibeto-Burman language group (Bradley 1979, 2002). Most Lalo[1] people call themselves *la̱²¹lu̱³³pa̱²¹*, while in Nanjian and Jingdong county Lalo people call themselves *mi⁵⁵sa²¹pa̱²¹*, which means Mengshe people (Yang 2015).[2] The Heima (Figure 1) Lalo variety investigated in this paper is spoken in Heima village, Zhujie Yi township, Changning County, Baoshan City, Yunnan province. They call themselves *la²¹lo²¹pa²¹*. The total population of the Heima village is 1,640 (2022), and they speak Lalo as their mother tongue.[3] According to the Changning County Chronicle (1985), the population of the Yi people who call themselves la²¹lo²¹pa²¹ is about 14,000. The main settlements of the Changning Yi "*la²¹lo²¹pa²¹*" are in Zhujie Yi and Goujie Yi townships.

According to Chen, Bian, and Li (1985) and Björverud (1998), the Lalo ethnic population is estimated to be about 500,000, with a speaker population of about 250,000. In a later publication, Chen, Bian, and Li (2009) claim that the number of speakers of Lalo is less than 150,000. On the other hand, Yang (2015) estimates that the speaker population is less than 300,000. Most Lalo native speakers live

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1 In most Chinese linguistic studies, creaky vowels are typically indicated with an underline, although the IPA convention marks them with a tilde below the vowel (e.g., a̰). The studies referenced in this paper have used an underline to denote creaky vowels.

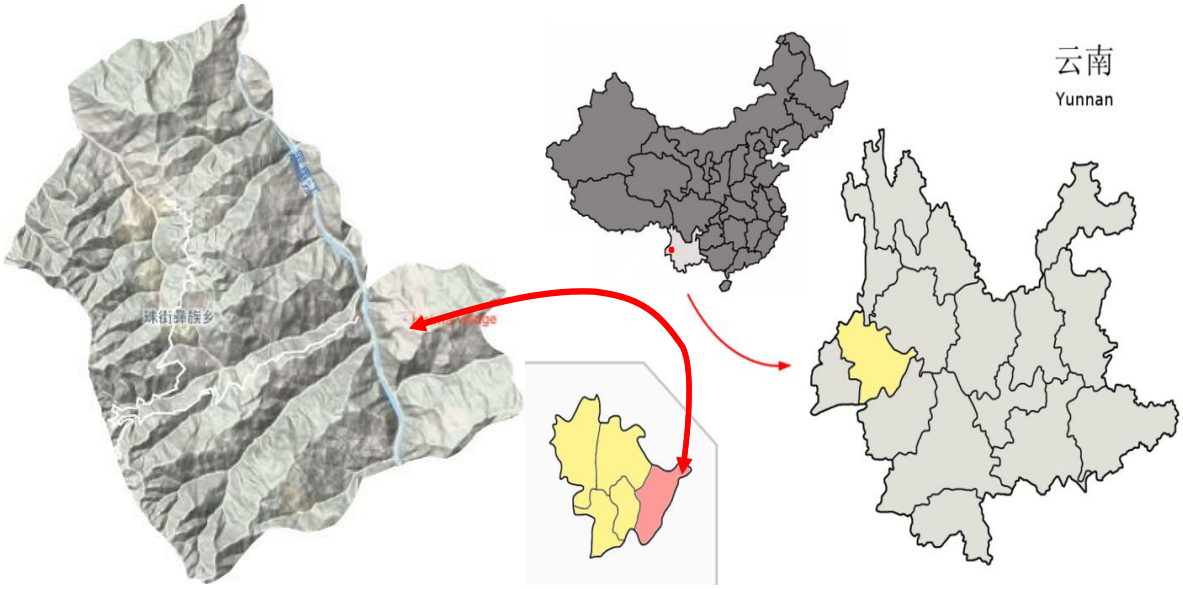
2 Mengshe is a historically significant region that served as the birthplace of the Nanzhao Kingdom, a semi-independent state that challenged the Chinese empire's control over Yunnan during the Tang Dynasty (618 to 907 A.D.) (Backus 1981, You 1994). The group refers to themselves as *mi⁵⁵sa²¹pa̱²¹* a term used for the ancient administrative region known as Mengshe or later Menghua, which initially encompassed southern Weishan and northern Nanjian (Bai 2002).

3 The population of Heima Village is based on the village's year-end statistical table (personal communication with the village head of Heima Village).

around the southern part of Dali, the northern part of Baoshan, the northern part of Lincang, and the northern part of Puer, centering on Nanshan and Weishan in Dali City, Yunnan Province. Although it appears to have a large speaker population, Lalo is considered a vulnerable language according to UNESCO's survey of languages and is in danger of disappearing (Moseley 2010). According to the Ethnologue (2023), Lalo is already considered an endangered language.

However, because Lalo identifies as an ethnic minority Yi, and there is no official survey that publishes the number of native speakers of Lalo, and it is unclear how much data has been obtained by Ethnologue, it is currently unknown how many native speakers of Lalo there are.

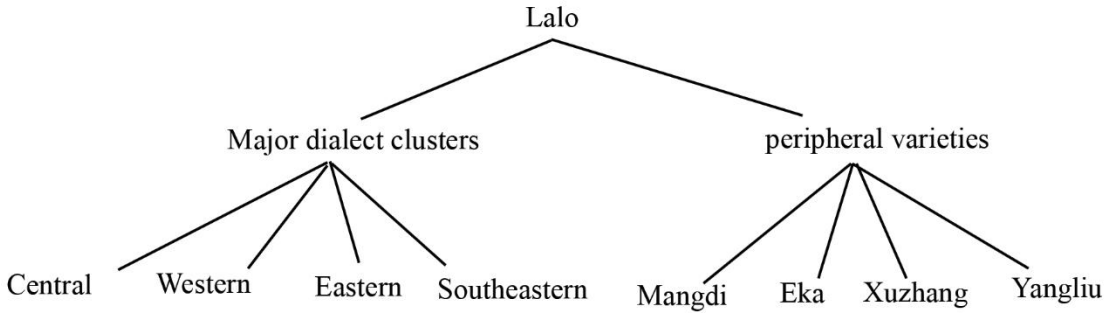
Figure 1: *Map of Heima village* (http://www.bigemap.com/source/terrain-40164.html, (https://commons.wikimedia.org/wiki/File:Location of Changning withinYunnan%28 China%29.png)



1.1 The dialects of Lalo

According to Chen, Bian, and Li (1985), Lalo has two dialects: the East Mountain dialect (東山土語) and the West Mountain dialect (西山土語). Yang (2015, Figure 2) classifies the dialects within Lalo based on phonological, phonetic, and geographical characteristics. She divides Lalo into four major dialect clusters, namely, Central, Western, Eastern, and Southeast, as well as Eka, Mangdi, Xuzhang, and Yangliu. According to Yang's classification, Heima Lalo is considered to belong to the Central Lalo dialect.

Figure 2: *Dialect of Lalo (Yang 2015, revised by author)*



1.2 previous studies

Study on Lalo's grammar is far from adequate and appears in only a few works. Björverud (1998) has analyzed the phonological and phonetic features of Lalo spoken in Longjie Township Weishan County.

Zhou's (2017) doctoral dissertation provides a reference grammar for Lalo, though the contents of this work are not fully available for verification. Existing research predominantly focuses on the varieties of Lalo spoken in Weishan and Nanjian Counties, with no studies addressing the grammar of Lalo as spoken in Changning County.

To date, only two studies have examined Lalo's object markers. Björverud (1998:126) discusses Lalo's general object marker *di²¹* and its historical linguistic origin, noting that *di²¹* is a locative marker that has been further grammaticalized to serve as a general object marker. While this marker is typically used with animate referents, it may also be applied to inanimate referents.

Hu and Zhou (2018) discussed Lalo Yi's patient marker *di³¹*, a form of differential object marking influenced by the animacy of the patient in relation to the agent. They also report that *di³¹* is isomorphic with markers for direct objects, locations, and indirect objects—a phenomenon commonly observed among Tibeto-Burman languages (Huang 2010).

Both studies focus on the origin and usage of the object marker. Hu and Zhou (2018) also show that the use of Lalo's object marker is driven by pragmatic factors and is not obligatory. In this paper, I present findings that the object markers in Heima Lalo differ from those reported in previous research. Furthermore, I identify an age-based variation in the use of these markers, which are explored in detail in the following sections.

1.3 Data source

The data for this study has been collected since the start of my master's degree in 2019. All data was gathered through fieldwork or online surveys, comprising over 10 hours of audio-visual recordings of both spontaneous and elicited speech, including monologues and dialogues. Additionally, I have compiled a lexicon with over 2,500 entries, five local folk tales and legends, and more than 30 local songs and tunes. To date, I have conducted two fieldwork trips: the first in January 2023 and the second in June 2023. Due to the COVID-19 pandemic, I was unable to conduct fieldwork from late 2019 until the end of 2022. During this period, I requested that consultants record and submit the necessary data.

1.4 Aim of the study

The aim of this paper is to describe the object marker and its functions in Heima Lalo. Lalo follows an Agent-Patient-Verb (APV) word order. If both the agent and patient are of the same hierarchical level and the patient is not marked, the sentence becomes ambiguous. In other words, Heima Lalo requires the marking of objects to avoid ambiguity. This marking system is influenced not only by the animacy hierarchy but also by definiteness and information flow.

The remainder of this paper is organized as follows: Section 2 outlines the various types of object markers in Heima Lalo, along with their respective functions. Section 3 examines the pragmatic features associated with the use of these object markers. Finally, Section 4 concludes the paper by summarizing the key findings and discussing their broader implications.

2 Object marker of Heima Lalo

Lalo is a nominative-accusative language in which the subjects of intransitive (Subject) and transitive (Agent) verbs are distinguished from the Patient of transitive verbs. Comrie (1989:133) points out that the parameters of animacy and definiteness can determine whether an object should take a specific accusative form. For instance, in Hindi, human direct objects typically carry the postposition *ko* regardless of definiteness. However, indefinite human noun phrases in the Patient position may occasionally appear without *ko*, often with an affective connotation. In contrast, non-human direct objects, particularly inanimate ones, do not carry *ko* if indefinite, though they typically do if they are definite.

Since the 1980s, there has been an increasing number of studies discussing animacy hierarchies. Silverstein (1976) proposed a hierarchy of animacy based on the case marking of nouns: first/second person > third person > proper noun > human > animal > inanimate. Comrie (1989: 128) further posits that a noun phrase is higher in animacy if it is to the left on a continuum some of whose main points

include human > animal > inanimate. Many typological studies from the 1990s (Comrie 1989; Croft 1991, 2003; Whaley 1997) have discussed the animacy hierarchy in greater detail.

Several linguists have categorized the use of object markers, which help to resolve ambiguity between the agent and patient, as Differential Object Marking (henceforth DOM) (Comrie 1989; Gemer 2008; Sinnemaki 2014 et al.). DOM is typically non-obligatory.

The pattern of differential object case marking has been observed in several Tibeto-Burman languages, including Central Tibetan (Delancey 2001), Yongren Lolo, and Lahu (Gerner 2008). Huang (2010) showed that the sequence of animacy hierarchies influences the presence or absence of agent markers in Qiang. Hu and Zhou (2018) also noted that the use of object markers in the Western dialect of the Yi language is optional and primarily governed by the animacy hierarchy of the agent and object.

In addition, this paper does not aim to discuss the general concept of DOM but focuses specifically on analyzing the object markers in Heima Lalo. We will not use the term "DOM"; instead, we will refer to it as "object marker."

2.1 The type and usage of Heima Lalo

Table 1 summarizes the types and usages of object markers in Heima Lalo. As shown in the table, the use of object markers in Heima Lalo varies across generations. Individuals over the age of 30 predominantly use *"li²¹"* as an object marker, while those in their 20s tend to use *"ɣə²¹"*. Younger speakers may exhibit a mixed usage of object markers or, in some cases, may not use any at all. However, this article will not address the use of object markers among the generation of younger speakers. categories, such as italicized glosses versus language samples.

Table 1: *Object marking in Heima Lalo across different generations*

Object marking	*-ɣə²¹*	*-li²¹*	*-ø/-ɣə²¹/-li²¹*
Generation	Among 20s	Over 30s	Under 20s

(1) *ŋa⁵⁵* *u³³-**li²¹/ɣə²¹*** *de³³*
1SG 3SG-OBJ hit
'I hit him/her.'[4]

As illustrated in example (1), both the agent and the patient are human, placing them on the same level in the animacy hierarchy. In such cases, a marker is necessary to distinguish the patient; otherwise, an unmarked sentence could result in ambiguity.

2.1 The original of Heima Lalo object marker

I have mentioned earlier that the object marker in Lalo has been identified as *di*. However, in Heima Lalo, the object markers are *ɣə²¹* or *li²¹*. Björverud (1998) claims that *di²¹* originally functioned as a locative marker that was further grammaticalized to serve as a general object marker. Hu and Zhou (2018) assert that the object marker *di³¹* in the western Yi dialects is isomorphic with the Yi locative and indirect object marker. Gerner (2008) also finds that in Yongren Lolo, a central dialect of Yi, the object marker *thie²¹* is derived from the meaning "on top of …".

LaPolla (1992) argues that most Tibeto-Burman languages, which mark Primary Objects, have grammaticalized different morphemes for this purpose.[5] Therefore, the marking of Primary Objects in these languages is relatively recent, as evidenced by the fact that even closely related languages have different Primary Object markers (e.g., Lahu and Akha), or may differ in whether Primary Object

[4] In Lalo, object markers vary generationally, differing only in form without semantic change. Here, a "/ " will denote alternative markers (Example 1): *li²¹* is used by speakers over 30 years old, and *yə²¹* by speakers around 20 years old. This notation will be applied in all examples.

[5] If in a language, the indirect object (goal, benefactive, etc.) of a ditransitive verb is the same as the direct object of a monotransitive verb, then that language can be said to have a Primary Object's and Secondary Object's distinction. It will be called a "Primary Object language" (Dryer 1986:815) with which Lalo can be affiliated.

markers are used at all (e.g., Akha uses Primary Object markers, while Hani does not). This suggests that object marking in Tibeto-Burman languages is of shallow historical depth, with variation across dialects. In Lalo, at least three object marker variants exist—*di, li²¹* or *ɣə²¹*, though previous research has typically only identified *di*.

LaPolla (1992) also mentions that the accusative marker is unmarked in many Tibeto-Burman languages. However, the dative or locative marker can sometimes be, or often is, used for accusative arguments, as in Balti, Bodo (Standard Plains Kachari), Bunan, Dhimal, Gurung. among other areas. Huang (2010) observes that the isomorphism between accusative, locative, and dative markers is not uncommon in Tibeto-Burman languages. Heima Lalo, like many Tibeto-Burman languages, exhibits this phenomenon of isomorphism.

In Heima Lalo, the markers *li²¹* or *ɣə²¹* function as object markers and markers for indirect arguments, including beneficiaries and recipients. These markers can only serve as locative markers in extremely rare instances where they mean 'on top of …'. When used as locative markers, they are distributionally restricted and cannot be applied to flat surfaces, such as "on the table" or "on the wall."

(2a) *sɻ̩³³dzi⁵⁵-li²¹* *a⁵⁵mu²¹-nə⁵⁵-dze⁵⁵* *phe⁵⁵-pe²¹*
tree-LOC horse-two-CLF tie up-ASP
'Two horses tied to a tree.'

(2b) *ŋa⁵⁵* *tɕi⁵⁵thə²¹* *khu⁵⁵-li²¹* *a⁵⁵tha²¹-pi⁵⁵* *si³³* *xə⁵⁵-ki²¹*
1SG now mountain-LOC knife-INST firewood chop-PROG
'I'm chopping wood with a knife on the mountains.'

(2c) **tsi⁵⁵tsi³³-li²¹* *tɕy⁵⁵tʂu³³ku⁵⁵* *me³³* *tʂhi³³-ku³³* *ta²¹-tɕi²¹*
table-LOC thing many one-CLF put-ASP
('There are a lot of things on the table.')

(2d) **lu⁵⁵ti³³-li²¹* *a⁵⁵pə²¹* *gy³³ti²¹-tʂhi³³-ma³³* *dʐu⁵⁵*
wall-LOC wallow nest-one-CLF have
('There is a swallow's nest on the wall.')

In the example (2a) and (2b), *li²¹* can be used as a locative marker, but in examples (2c) and (2d), *li²¹* does not have this function. But examples like (2a) and (2b) are extremely rare. In general, the location of Heima Lalo is marked with *ku³³* as in examples (3a) and (3b).

(3a) *gə²¹tu⁵⁵-ku³³* *tʂhu⁵⁵-ŋa³³-ma³³* *di⁵⁵-tɕi²¹*
courtyard-LOC man-five-CLF sit-ASP
'Five men are sitting in the yard.'

(3b) *ni³³ta³³-ku³³* *tʂhu⁵⁵-tʂhi³³-ma³³* *xə²¹*
there-LOC man-one-CLF stand
'A man is standing there.'

(4a) *ŋa⁵⁵* *ɣə⁵⁵lu³³-li²¹/ɣə²¹* *ɣə⁵⁵* *ɕy³³* *gu³³*
1SG flower-IND.OBJ water sprinkle give
'I water the flowers.'

(4b) *a⁵⁵ma³³* *ŋa⁵⁵-li²¹/ɣə²¹* *pho⁵⁵-o²¹xə⁵⁵-tʂhi⁵⁵-khe⁵⁵* *ku³³* *gu³³*
mom 1SG-IND.OBJ cloth-new-one-CLF sew give
'Mom sewed a new dress for me.'

Based on the above examples, Heima Lalo like other Tibeto-Burman Languages (e.g. Lahu, Akha, Lolo, etc.) exhibits isomorphic phenomena between direct object markers, locative markers, and indirect object markers. Let us consider the examples (4c) and (4c'), which are quite intriguing.

(4c) *khu⁵⁵tʂi³³-mu³³la²¹* *pe²¹* *di²¹li²¹*
mountain-on top climb go up
'Climb to the mountain.'

(4c') *khu⁵⁵tʂi³³-mu³³la²¹* *di²¹li²¹*
mountain-on top go up
'Climb to the mountain.'

As shown in examples (4c) and (4c') *di²¹li²¹* conveys the meaning of "going up" or an upward movement. In the Lalo language, motion verbs denoting "to go" are marked with the morpheme *li²¹*, specifically to indicate movement from a lower place to a higher place or from a small place to a big place (for example, when expressing movement from rural areas to urban areas, the verb *li²¹* is used to denote "to go."). Thus, the morpheme *li²¹* embodies a semantic sense of upward or ascending direction.

I hypothesize that the object marker may have developed from "*di²¹li²¹* ". however, the verb *li²¹* has not yet been fully grammaticalized and remains in the process of transitioning from a lexical word to a functional word. Nonetheless, we lack sufficient evidence to confirm its origin. It is challenging to explain the grammaticalization of ***li²¹*** from the meaning "on...". Nevertheless, we can tentatively hypothesize that the Heima Lalo object marker emerged relatively recently and developed independently.

2.3 The appearance conditions of Heima Lalo's object marker

I have posited that Heima Lalo object markers are employed primarily to resolve semantic ambiguity, specifically to clarify the object when needed. This usage is associated with the animacy hierarchy and definitions, as it is described in Section 2 about Silverstein's hierarchy and definitions.

As Silverstein (1976) pointed out, in many languages syntactic and morphological distinctions (such as object markers, agreement, or word order) are influenced by animacy. Higher-ranked items on this hierarchy are more likely to take precedence in subject or object positions, and they may trigger specific grammatical markers. For instance, first and second-person entities may receive distinct treatment in terms of case marking or verb agreement, compared to inanimate objects.

As previously mentioned, in Heima Lalo, object markers play a crucial role in disambiguating subjects and objects within sentences. Objects positioned higher on the animacy hierarchy may require explicit marking to differentiate them from the subject, especially when the animacy of the subject and object is of equal rank.

2.3.1 Agent and patient at the same rank

When the agent and patient belong to the same rank in the hierarchy, the patient must be marked by *li²¹* or *ɣə²¹*. When the agent and patient belong to the same rank in the hierarchy, the patient must be marked by *li²¹* or *ɣə²¹*.

Examples from (5a) to (5f) show the use of monotransitive verbs, and examples from (6a) to (6c) show the use of ditransitive verbs.

(5a) *se³³mi⁵⁵-dzi⁵⁵ se³³tʂhi³³-dzi⁵⁵-li²¹/ɣə²¹ kha⁵⁵tshi²¹-tɕi²¹*
walnut tree-clf pear tree-CLF-OBJ shade-ASP
'The walnut tree shades the pear tree.'

(5b) *a⁵⁵ni²¹-ɣə²¹-ma³³ a⁵⁵ni²¹-u⁵⁵-ma³³-li²¹/ɣə²¹ kho²¹*
cat-big-NOM cat-small-NOM-OBJ bite
'The big cat bites the little cat.'

(5c) *lao³³si³³ ŋe³³-li²¹/ɣə²¹ khao⁵⁵*
teacher 1SG-OBJ scold
'The teacher scolded me.'

(5d) *tʂə⁵⁵-tʂi⁵⁵ɣo²¹ ŋa⁵⁵ ma²¹-sa²¹ nə⁵⁵ si⁵⁵-li²¹/ɣə²¹ ne⁵⁵-ʑe³³-li²¹*
DEM-CLF 1SG NEG-know 2SG other-DAT ask-go-DIR
'I'm not sure about this, ask someone else.'

(5e) *u³³-li²¹/ɣə²¹ ɣə⁵⁵ du⁵⁵-tuo³³*
3SG-OBJ water drink-CAUS
'Let him drink water.'

(5f) *ŋa⁵⁵-li²¹/ɣə²¹ dzə³³ ma³³-dzə²¹-tuo³³*
1SG-OBJ food NEG-eat-CAUS
'Don't let me eat.'

(6a) *a⁵⁵ma³³ ŋa⁵⁵-li²¹/ɣə²¹ pho³³mo⁵⁵-li²¹/ɣə²¹ dzə³³-ø tʂa³³ li²¹ bi²¹*
mom 1SG-OBJ younger brother-DAT food-ø feed go EVI
'Mom told me to feed my younger brother.'

(6b) *a⁵⁵ma³³ ŋa⁵⁵-li²¹/ɣə²¹ pho⁵⁵-o²¹xə⁵⁵-tʂhi⁵⁵-khe⁵⁵ ku³³-gu³³*
mom 1SG-DAT cloth-new-one-CLF sew-give
'Mom sewed a new dress for me.'

(6c) *ŋa⁵⁵ u³³-li²¹/ɣə²¹ thiu²¹pen²¹-tʂhi³³-pen²¹ gu³³-pe³³*
1SG 3SG-DAT book-one-CLF give-ASP
'I gave him a book.'

In example sentences (5) to (6), the object marker is obligatory and cannot be omitted as its absence would lead to ambiguity. For instance, in examples (5e) and (5f), the presence of the object marker *li²¹/ɣə²¹* clarifies the recipient of the action, even in the absence of an explicit agent.

Sentence (6a) demonstrates a specific nuance. In this sentence, the beneficiary is the younger brother *pho³³mo⁵⁵,* while the direct object is the food *dzə³³*. The attachment of *li²¹/ɣə²¹* to the first-person pronoun *ŋa⁵⁵* emphasizes the unique nature of the sentence due to the presence of the evidential particle *bi²¹*. The lack of the direct object marker is attributed to the object's lower position in the animacy hierarchy relative to the agent of the subordinate clause. Furthermore, marking the beneficiary conveys a specific and definite meaning, indicating that, among multiple younger brothers, the action of feeding is directed towards one particular younger brother.

In the ditransitive verb examples (6b) and (6c), the beneficiary must be explicitly marked, as it holds the same hierarchical level as the agent. However, the direct object does not require such marking in both cases.

2.3.2 Patient rank < agent rank

In cases where the patient ranks lower than the agent on the animacy hierarchy, the marking of the patient is generally not required. For example, in contexts involving shared human knowledge, the object marker *li²¹/ɣə²¹* may be omitted. However, this rule is not absolute, and exceptions exist. Therefore, the use of the object marker is not arbitrary; it is conditioned by specific factors.

(7a) *a⁵⁵tɕy³³ a⁵⁵ʑi²¹zo²¹-ø tʂhi⁵⁵*
eagle chicken-ø catch
'The eagle catches the chicken.'

(7b) *a⁵⁵khə²¹ a⁵⁵ni²¹-ø tʂu⁵⁵ se²¹*
dog cat-ø catch like
'Dogs like to catch cats.'

(7c) *ŋa⁵⁵ tʂhi²¹-ø ʂi⁵⁵ tʂhi²¹-pa³³ tʂa²¹*
1SG sheep-ø grass one-CLF feed
'I feed the sheep a handful of grass.'

(7d) *u³³ dzə³³-tʂhi³³-phi²¹-ø dzə²¹-tɕi²¹*
3SG food-one-CLF-ø eat-ASP
'He ate a bowl of rice.'

(7f) *n̩³³tsə³³- niao²¹ a⁵⁵ʑi³³-ø ɕi²¹-ha⁵⁵-tɕi²¹*
2PL-two chicken-ø kill-PF-ASP
'The two of you killed the chicken.'

In examples (7a) and (7b), both the agent and the patient share the same position in the animacy hierarchy, as both are animate nouns (specifically, referring to animals); however, there is no requirement for a marker on the patient. I propose that shared knowledge—or more broadly, extralinguistic factors—plays a significant role in shaping this interpretation. Similar phenomena are frequently observed among Asian languages.

As in examples (7c) to (7f), the subject's position in the hierarchy is significantly higher than that of the patient, patient marking is generally not required. If the patient is marked, it often indicates the result of an action being applied to the patient, as shown in example (8).

(8a) *ŋa⁵⁵ ɣə⁵⁵lu³³-li²¹/ɣə²¹ ɣə⁵⁵ ɕy³³ gu³³*
1SG flower-DAT water watering give
'I water the flowers.'

(8b) *a⁵⁵ma³³ a⁵⁵ʑi²¹-li²¹/ɣə²¹ ŋe⁵⁵tshi³³ du⁵⁵ ʑe⁵⁵*
mom chicken-DAT medicine drink go
'Mother is giving medicine to the chicken.'

(8c) *ŋa⁵⁵ a⁵⁵vi²¹-li²¹/ɣə²¹ dzə³³ tʂa³³*
1SG pig-DAT food feed
'I feed the pig.'

In examples (8a) through (8c), although the patient ranks hierarchically lower than the agent, it nonetheless necessitates morphological marking. In these instances, this marking functions to denote the beneficiary of the action, suggesting that, within the framework of grammatical relations, the direct object marker and the indirect object marker share the same morphemic form. It could further be argued

that, from the perspective of case relations, this phenomenon exemplifies isomorphism between dative and accusative markers.

Furthermore, in examples (8b) and (8c), marking the patient also conveys a sense of definiteness. Specifically, in (8b), the chicken being fed by the mother is specified as distinct from other chickens, and in (8c), the pig being fed is recognized as separate from other pigs.

In conclusion, when the patient ranks lower than the agent, the requirement for marking the patient is influenced by the context. The decision to mark depends on whether the sentence reflects commonly shared knowledge (or extralinguistic factors) or indicates a specific beneficiary.

2.3.3 Agent rank < patient rank

In cases where the positions of the agent and patient deviate from standard conventions or shared knowledge, particularly when the animacy level of the patient exceeds that of the agent, it becomes necessary to mark the patient *li²¹* or *ɣə²¹* explicitly to ensure clarity. As shown in example (9):

(9a) *a⁵⁵khə²¹* *ŋe³³-li²¹/ɣə²¹* *kho²¹-tʂo²¹*
dog 1SG-OBJ bite-ASP
'The dog has bitten me.'

(9b) *a⁵⁵ʑy²¹* *ŋe³³-li²¹/ɣə²¹* *tɕi²¹-la²¹*
needle 1SG-OBJ prick-SFP
'The needle pricked me.'

As demonstrated in example (9), shared human knowledge informs us that people do not typically allow themselves to be pricked by a needle or deliberately permit a dog to bite them. However, when such actions occur accidentally or under coercion, the patient must be marked with *li²¹/ɣə²¹*.

In this section, we analyzed the origin, types, and conditions of use of the Heima Lalo object marker. We also investigated its application in contexts where the patient and agent differ in their positions within the animacy hierarchy. Our findings indicate that the use of the Heima Lalo object marker is not strictly obligatory; while influenced by animacy hierarchies, it is not solely determined by them. Shared human knowledge also plays a role in the decision to use the marker. Similar to many other Tibeto-Burman languages, Heima Lalo exhibits isomorphic phenomena among direct object markers, locative markers, and indirect object markers.

3 The pragmatic features of the object marker

In Section 2, we explored the relationship between object marking, definiteness, and animacy hierarchies. This subsection focuses on the role of object marking within sentences from the perspective of information structure.

Hu (2021) examined Nuosu Yi (a Tibeto-Burman language), in which the basic word order alternates between APV and a rigid PAV structure. Depending on the telicity and aspectuality of the predicates, to be specific, the atelic and/or imperfective predicates are APV, while the telic predicates indicated by the resultativity or perfect aspect are PAV. However, in Heima Lalo, word order is not influenced by the telicity or atelicity of the sentence, nor by perfective or imperfective aspects. Instead, the transition from the basic APV structure to the PAV structure in Heima Lalo is governed by information flow. In topic-prominent languages, it is common to move a non-initial argument to the initial position to emphasize topic structure.

Hu (2021) indicates that in languages with a dominant APV word order, such as Nuosu Yi and many other Tibeto-Burman languages, the alternative PAV word order, motivated by pragmatic and semantic factors, can always be reverted to the original APV order, as shown in (10a) and (10b) (Hu 2021).

(10a) *khɯ³³ a⁴⁴ʑi³³ ɕi⁵⁵ ==o⁴⁴* [Nuosu Yi] (APV)
dog child bite ==PFV.IND$_2$
'The dog bit the child.'(Hu 2021:42)

(10b) *a⁴⁴ʑi³³ khɯ³³ ɕi⁵⁵ ==o⁴⁴* [Nuosu Yi] (PAV)
child dog bite ==PFV.IND$_2$
'The dog bit the child.' (Hu 2021:42)

We can observe that in (10a) and (10b), the semantic roles of the agent and patient are distinguished by the animacy hierarchy of the referents and shared knowledge, rather than by the flow of information. The situation in Heima Lalo is different, as illustrated by (11a) and (11b).

(11a) *a⁵⁵khə²¹ a³³ni⁵⁵-li²¹/ɣə²¹ kho²¹-tʂo²¹* (APV)
dog cat-OBJ bite-ASP
'A dog has bitten a cat.'

(11a') *a³³ni⁵⁵-ø a⁵⁵khə²¹ kho²¹-tʂo²¹* (PAV)
cat dog bite-ASP
'The cat, the dog has bitten it.'

(11a'') *a³³ni⁵⁵-ø a⁵⁵khə²¹-khə³³ kho²¹-a⁵⁵-ki²¹-tɕi²¹* (PAV)
cat dog-SUB bite-PER-PASS-ASP
'The cat was bitten by the dog.'

(11b) *a⁵⁵khə²¹ ŋe³³-li²¹/ɣə²¹ kho²¹-tʂo²¹* (APV)
dog 1SG-OBJ bite-ASP
'The dog has bitten me.'

(11b') *ŋa⁵⁵-ø a⁵⁵khə²¹ tʂhi³³-khe⁵⁵ kho²¹-tɕi²¹* (P_{TOP},AV)
1SG dog one-CLF bite-ASP
'Me, a dog has bitten me.'

(11b'') *ŋa⁵⁵-ø a⁵⁵khə²¹-khə³³ kho²¹-a⁵⁵-ki²¹-tɕi²¹* ($PA_{-SUB}V$)
1SG-ø dog-SUB bite-PFV-PASS-ASP
'I was bitten by the dog.'

(12) *sɻ̩³³dzi⁵⁵ku³³ kə³³ a⁵⁵nə²¹ me²¹tʂhi²¹ku³³ niu⁵³*
forest TOP bird too many have
'There are many birds in the forest.'

The patient element in a non-initial position can be extraposed to the clause-initial position as a topic, as illustrated in (11a') and (11b'). When patient is fronted to the sentence-initial position as a topic, it is often followed by a pause and may be marked with the topic marker *kə³³* (example12). The PAV order, derived from a split of the basic APV structure, can also convey syntactic roles by marking agent, specifically through the addition of the subject marker *khə³³*. In this syntactic configuration, a pause following patient is not obligatory. However, in (11a'') and (11b''), if there is no pause after patient and agent is unmarked in any way, the sentence may become ambiguous. The interpretation could shift between "A cat bites a dog" and "I bite the dog." As demonstrated in (11a) and (11b), the marking of patient is related to the animacy hierarchy (see Section 2 for further details, which are not elaborated on here).

Based on the example in sentence (11), we can further conclude that the shift from the basic APV word order to the PAV structure is not related to the telicity or aspectuality of the predicates like Nuosu Yi. Rather, it pertains to the flow of information structure. Depending on the communicative needs of the discourse, information positioned closer to the beginning of the sentence is generally perceived as more salient. Typically, the sentence-initial position is reserved for the topic element, which may be followed by a pause after patient or marked with a topic marker.

3.1 Complex structures with APV and PAV word order

Although this section is not directly related to object marking, we discussed at the beginning of Section 3 that, according to the priority of information transmission, the patient can be distinguished either by using an object marker or by splitting the APV word order into a PAV structure. In this section, we aim to examine the occurrence of PAV structure splits in complex sentences.

In this section, we will analyze word order in complex structures, including complement clauses, relative clauses, and transitive sentences. The word order in subordinate clauses consistently follows an APV structure. In contrast, in complex structures, the word order of main clauses is not strictly APV and may adopt an AVP structure, as illustrated in (13a) through (13d). In the examples below, elements within square brackets [ ] indicate subordinate clauses.

(13a) *ɕao⁵⁵waŋ³³ di⁵⁵ [ɕao⁵⁵li³³ u³³ɣə²¹u³³di²¹ se²¹]$_{REL.ACC}$*
Wang thinks [Li 3REFL like]
'Wang thinks Li likes himself/herself (referring to Li, not Wang).'

(13b) *ɕao⁵⁵waŋ³³ mo⁵⁵ [ŋe³³-ɣə²¹ pho⁵⁵tshi³³ ɕy²¹tu²¹-ku³³-pa²¹]$_{REL.NOM}$ ɕao⁵⁵li³³ ŋa³³*
Wang see [1SG-POSS cloth collect-give-NMZ] Li COP
'Wang saw that the person who collected my clothes was Li.'

(13c) *ɕao⁵⁵waŋ³³ bi²¹ [u³³ a²¹yn⁵⁵nə³³ u³³-ko²¹ko²¹ pe⁵⁵tɕin³³ ʑe³³-pa²¹]$_{REL.ACC}$*
Wang say [he/she tomorrow 3SG-REFL Beijing go-FUT]
'Wang said that he/she will go to Beijing by himself tomorrow.'

(13d) *ŋa⁵⁵ xa⁵⁵gə²¹gə²¹ mu⁵⁵ [a⁵⁵khə⁵⁵-bu²¹ na⁵⁵-tʂhi⁵⁵-ma³³*
1SG with my own eyes see [dog-spot DEM-1-CLF
ba²¹ti²¹tɕi⁵⁵ba²¹tɕi²¹lə⁵⁵ tʂho⁵⁵-ɣu⁵⁵ɣu⁵⁵ di⁵⁵]$_{REL.ACC}$ ɕa⁵⁵ mu³³
jump up and down very-DUP funny] ? EVI
'Watching that spotted dog jumping up and down is very amusing.'

In the complex sentence shown in example (13b), the basic APV word order is retained within subordinate clauses. The subordinate clause in (13b) is further divided into a main clause and another subordinate clause. The subordinate clause maintains the APV word order, while the main clause exhibits an AVP structure. Similarly, in sentences (13a), (13c), and (13d), the subordinate clauses display APV word order, whereas the main clauses follow AVP order.

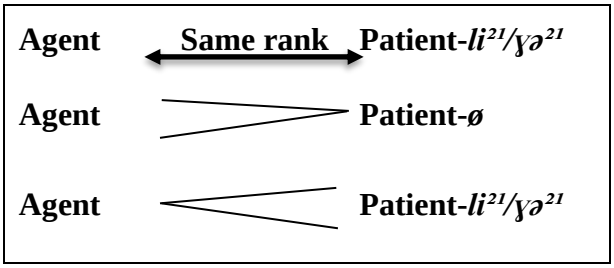
When a personal name functions as the subject of a subordinate clause, a long form of the reflexive pronoun is used (u³³ɣə²¹u³³di²¹=3REFL), as demonstrated in example (13a). However, when the pronoun itself is the subject of the subordinate clause, a short form is used (u³³-ko²¹ko²¹), and reduplication is not required (13c). The selection of reflexive pronouns will not be further elaborated in this discussion.

In summary, in sentences containing evidentiality(13d) and relative clauses (13a to 13c), the word order in subordinate clauses generally adheres to the basic sequence and is less likely to shift into PAV order. This characteristic contrasts with that of simple sentences, where the APV order can be rearranged into PAV to meet the demands of information structure.

4 Conclusion

This paper overviewed some object marker features of the Heima Lalo Language utilizing my own descriptive works. The findings can be summarized as in Figure 3.

Figure 3: *usage of the object markers in Lalo*



(1) The analysis of object markers in the Lalo language as spoken in Heima village diverges from findings in previous studies, which identify *di³¹* as the object marker (Björverud 1998; Hu and Zhou 2018). Heima Lalo exhibits two distinct object markers, *ɣə²¹* and *li²¹*, which are used differently among generations. Specifically, the younger generation (mainly those over 20) tends to use *ɣə²¹* as the object marker, while older speakers (those over 30) predominantly employ *li²¹*.

(2) Object markers in Heima Lalo are used for patient marking only when semantic ambiguity may arise, which is mainly related to animacy hierarchy (Figure 3).

(3) The basic APV word order in Heima Lalo can shift to a PAV structure based on pragmatic and semantic factors rather than syntactic ones. This alignment is influenced not by the telicity or aspectuality of the predicates like Nuosu Yi (Hu 2021) but rather by the flow of information. Information positioned closer to the beginning of the sentence typically holds greater importance.

(4) In general, the sentence-initial position is typically reserved for the topic element, which can be marked by a pause after the patient or the addition of a topic marker. In some sentences with passive meaning, the patient is at the initial of the sentence, and the agent has its marker *khə³³* (example 11a", and 11b").

(5) Shared human knowledge or extralinguistic factors often reduces the occurrence of *li²¹/ɣə²¹*, even if the patient is higher than the agent in the animacy ranking.

In addition to dialectal variation, object marking in Heima Lalo exhibits considerable variability. The use of object markers in other dialects may be significantly more complex than what has been described or summarized in this paper. This underscores the need for more extensive linguistic data and a more detailed analysis.

Abbreviation for Glosses

1SG	first-person singular	DOM	differential object marking	NMZ	nominalization
2SG	second-person singular	DIR	directional	NOM	nominative
3SG	third-person singular	DUP	duplicative	OBJ	object marker
ACC	accusative	EVI	evidentiality	PASS	passive
ASP	aspect	FP	final particle	PER	perfective
CAUS	causative	FUT	future	POSS	possess
CLF	classifier	IND	indirect	PROG	progressive aspect
COP	copula	INST	instrument	REFL	reflexive pronouns
DAT	dative	LOC	locative	REL	relative
DEM	demonstrative	NEG	negative	SUB	subject marker

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ARGUMENT MARKING IN RUMAI, PALAUNG

Rachel WEYMUTH
Myanmar Cultures and Languages Support Project (MCL)
rachel.weymuth@gmail.com

Abstract
In Rumai, a variety of Palaung (Palaungic, Austroasiatic), the oblique *tʌʔ*, the locative *pʌʔ*, and the complementizer *lʌʔ* are used for argument marking. The oblique *tʌʔ* generally marks the G argument in ditransitive clauses. Additionally, it is used to mark the P and T arguments in verb-initial dependent clauses, and the P argument with certain verbs. The locative *pʌʔ* and the complementizer *lʌʔ* both mark S and P arguments in certain circumstances. Furthermore, *pʌʔ* marks adjuncts, and *lʌʔ* is used to mark possession when a head noun is missing. In this paper, the main uses and functions of the markers will be shown, and some explanations for their use will be given.

Keywords: Austroasiatic, Palaung, Rumai, argument marking
ISO 639-3 codes: rbb

1 Introduction

Rumai, a Palaungic language of the Austroasiatic language family is mainly spoken in Northern Shan State in Myanmar by some 140,000 people. Some Rumai communities are also found in Mandalay region, west of Northern Shan State, and in Yunnan, China, in the north. Rumai is one of three varieties of Palaung, the others being Shwe, spoken in adjacent regions south of the Rumai, and Ruching whose speakers mainly live in Southern Shan State. The Palaung have had their own script since 1972, based on the Burmese script with some additional signs. However, literacy among the Palaung is not widespread. So far, there are no grammatical descriptions of Rumai except for two papers by the present author, one about verbal affixes (Weymuth 2018), and the other about secondary verbs (Weymuth 2023). Therefore, all the Rumai examples are from the corpus of the present author, collected in Myanmar from 2013 to 2020. They include sentences from written texts as well as from recordings of conversations and picture stories, and elicited sentences from questionnaires.

Rumai constituent order is basically SV and AVP, but most of the dependent clauses are VS and VAP. This is important for argument marking, as it partly depends on the clause structure. While the P and T arguments in verb-medial clauses are unmarked, they are preceded by the oblique marker *tʌʔ* in verb-initial clauses. Constituent order also expresses the grammatical relations in AVP-clauses, but also in verb-initial clauses with the usual VATG-order where both the T and G arguments are marked by *tʌʔ*.

This study follows rather a semantic than a formal definition of transitivity. A formal approach includes transitive and intransitive verbs, while the semantic approach can be seen as a continuum, that considers all the participants that may go with a verb (Kittilä 2011:348). An example are the goals and sources that usually accompany verbs of motion.

In this paper, marking of the arguments in Rumai clauses is described and discussed.[1]

[1] Abbreviations used are: 1 first person; 2 second person; 3 third person; ADD additive; ANA anaphoric demonstrative; CLF classifier; COMP complementizer; COMPAR comparative; COND conditional; DES desiderative; DU dual; DUR durative; EMPH emphasis; EXCL exclusive; INCEP inceptive; INCL inclusive; IPFV imperfective; IRR irrealis; LOC locative; NEG negative; NML nominalizer; OBL oblique; PL plural; PN proper name; POL polite; PROH prohibitive; PROX proximal demonstrative; PTCL particle; Q question marker; REL relativizer; RESTR restrictive; SFP sentence final particle; SG singular; UP upper demonstrative.

2 The argument markers

The argument markers in Rumai include the oblique *tʌʔ*, the locative *pʌʔ*, and the complementizer *lʌʔ*. Their main functions are summarized in Table 1:

Table 1: *Main functions of the Rumai argument markers*

Marker	**Functions** (marking)
Oblique *tʌʔ*	G arguments
	P and T arguments in verb-initial dependent clauses
	P arguments with certain verbs
Locative *pʌʔ*	Adjuncts
	S and P arguments 'a place where one Vs'
Complementizer *lʌʔ*	P arguments (complement clauses)
	S arguments in existential clauses
	Possession without head noun

The following sections show the use and the functions of the markers in detail.

2.1 Oblique tʌʔ

The main use of oblique *tʌʔ* is to mark the G argument in a ditransitive clause. But the argument besides A and T in a ditransitive clause can also be a source, therefore the gloss of *tʌʔ* is OBL and not GOAL. In verb-initial transitive clauses, the P, and in ditransitive ones both the T and the G arguments are marked by *tʌʔ*, and so are the P arguments with some verbs in verb-medial clauses. These features are discussed in this section.

2.1.1 Ditransitive verb-medial clauses

Example (1) shows the most typical ditransitive verb 'give' where the goal 'child school (student)' is marked by *tʌʔ*.

(1) *sra* *dɛh* *cəʔuʔ* ***tʌʔ*** *kɔ̂ːn* *cʰôŋ*
teacher give book OBL child school
'The teacher gave the book to the student.' (EGGD_16_M_3_004)[2]

The verb 'get' may also have three arguments, but here the third argument is a source (2).

(2) *ʔʌ̂w* *bɤ̂n* *cəʔuʔ* *ʔu* *ʔuʔ* ***tʌʔ*** *ʔân*
1SG get book one CLF OBL 3SG
'I got a book from her.' (ECC_16_M_1_088)

In example (3), the first-person singular pronoun *ʔʌ̂w* represents a beneficiary.

(3) *rêən*[3] *kêcû* *dâːŋ* *ɟɤh* *kʰʌŋ* ***tʌʔ*** *ʔʌ̂w* *pʌp* *ʔu* *cen*
do benefit big buy POL OBL 1SG book one dozen
'Please, buy a dozen of books for me.' (WPKT_14_L_136)

Verbs of "saying" may also have three arguments (4).

(4) *nʌŋ-lo* *lʌh* *kəlâːŋ* *ʔəpom* *nî* ***tʌʔ*** *ma* *mâj* *ʔəkʰâj*
IRR-need Q tell story PROX OBL mother 2SG really
'Should I really tell this story to your mother?' (ECC_16_M_1_086)

[2] The Appendix contains information on the sources of data in this article.

[3] What is transcribed as *eə* is not a diphthong in Rumai, but a phonemic vowel between /e/ and /ɛ/.

The ditransitive clause in example (5) is a conditional clause. As in other verb-medial clauses, only the G argument *ʔʌ̂w* '1SG' is marked by *tʌʔ*, and not the T argument *lɛjsa* 'address' like in verb-initial clauses.

(5) [*kʰʌ ʔân ʔə-dɛh lɛjsa ʔân* ***tʌʔ*** *ʔʌ̂w*] *ʔʌŋ-hâːw hlɛ̂ pʌʔ ʔân*
COND 3SG INCEP-give address 3SG OBL 1SG 1SG.IRR-go visit LOC 3SG
'If he gave me his address, I would have gone visiting him.' (ECC_16_M_3_049)

Nevertheless, conditional clauses are dependent, as they can only be negated by *buː-* and not by *ʔaːw-* and *-maʔ*, which are restricted to independent clauses (6).[4]

(6) *mâj* ***ʔaːw-bɛ-maʔ*** *lʌʔ ʔɔːŋ bèə* [*kʰʌ mâj* ***buː-dih*** *bèə*]
2SG NEG-can-NEG COMP pass text COND 2SG NEG-read text
'You cannot pass the exam, if you don't learn.' (EMR_19_M_3_076)

This shows that the marking of the P or T argument (direct object) by *tʌʔ* is not dependent on subordination, but on constituent order.

2.1.2 Verb-initial clauses

Most of the dependent clauses are verb-initial, and in these, besides the G arguments, the P and T arguments are marked by *tʌʔ*.

Argument dropping (pro-drop) is frequent in Rumai, like in many languages of Southeast Asia. This is also the case for the A argument *ʔɛ̂* (in parentheses) of the temporal clause in example (7), which directly follows *rêən* 'do'.

(7) *lo cʰeəp gjô təʔâːŋ tɔ̂ːn cʰeh* [*təvâːŋ rêən (ʔɛ̂)* ***tʌʔ***
need wear clothes Ta'ang every person when do 1PL.INCL OBL
plɔ̂ːj bèə.bâːn kâːj tʰûŋ.hmêəm ʔɛ̂ təʔâːŋ]
festival literature ADD culture 1PL.INCL Ta'ang
'Everyone must wear the Ta'ang traditional dress during our Ta'ang literature and culture festival.'(WPKT_14_L_088)

The temporal clause in example (8) contains three arguments, and both the T and the G arguments are marked by *tʌʔ*. The order is as usual VATG, which can, besides the semantics, give a hint about the functions of the two arguments.

(8) [*kʰaj dɛh ʔʌ̂w* ***tʌʔ*** *pôm* ***tʌʔ*** *bʌwpʰûŋ ʔʌ̂w*] *ʔân pjɔ kʰâj*
time give 1SG OBL rice OBL friend 1SG 3SG happy very
'When I gave rice to my friend, he was very happy.' (pc_3)

As the A argument *jâːj* (in parentheses) is dropped in the relative clause in example (9), the marking of the P argument *kâ* 'car' by *tʌʔ* is essential to the meaning of the clause. Without *tʌʔ*, it would mean 'At that place, where the cars crossed…'.

[4] For negation in Rumai, see Weymuth (2018), and Weymuth (forthcoming).

(9) *tʌŋ di [kʰəlɔh (jâːj)* ***tʌʔ*** *kâ dɤ̂]* *meəh di kʰəlɔh ʔî*
LOC place cross 1DU.EXCL OBL car ANA exist place cross others
ʔî dʌh di kʰəlɔh ʔumbjʌ̂ŋ bèə
others say place cross horse text
'At that place, where (we) crossed the cars (the street), there is a place called a zebra crossing.' (W2_15_M_3_013)

In example (10), the complement clause has the usual constituent order VAP, and the P argument is marked by *tʌʔ*.

(10) *ma ʔân ʔə-nʌ̀ [bjâ ʔân* ***tʌʔ*** *pəsan]*
mother 3SG INCEP-know steal 3SG OBL money
'His mother found out that he had stolen money.' (EMSR_19_M_3_004)

The verb *meəh* 'exist' also means 'have', and in this meaning, it takes a P argument like in the following manner clause (11).

(11) *ʔân kjô.kjâ lʌʔ lɔːt dɛ̂w ʔân kjô.kjâ tʰan*
3SG make.efford COMP free run.away 3SG make.effort as.much.as
bɛ ʔân [tʰan meəh ʔân ***tʌʔ*** *blɔ̂m]*
can 3SG as.much.as exist 3SG OBL strength
'He made effort to get out, he made effort as much as he could, with all his might.' (W4_15_M_3_004)

2.1.3 P arguments with certain verbs

There are some bipartite verbs that take an argument marked by *tʌʔ*. In these clauses, *tʌʔ* can often be translated as 'with' or 'together with', so that it is used in comitative function.

With a comitative function of *tʌʔ*, the meaning in (12) is rather "marry together" than "marry someone".

(12) *ʔân pʰlâːn jâːw ʔân ʔaːw-bɤ̂n-maʔ lʌʔ kʰʌ̀* ***tʌʔ*** *ʔîː.lôj*
3SG poor very 3SG NEG-get-NEG COMP marry OBL virgin
'He is very poor, so he cannot marry the girl.' (ECC_16_M_3_014)

Examples (13) to (15) show the comitative function of *tʌʔ* with different verbs.

(13) ***tʌʔ*** *cʰeh hméə ʔʌ̂w lo tɔ̀ hâːw ʔʌ̂w nʌ̀-maʔ*
OBL person which 1SG need follow go 1SG know-NEG
'I don't know, whom I have to follow.' (EMR_19_M_3_102)

(14) *ʔân ʔaːw-bɤ̂n-maʔ gɔ̂ːj* ***tʌʔ*** *jê*
3SG NEG-get-NEG stay OBL 1PL.EXCL
'He cannot stay with us.' (EMR_19_M_3_010)

(15) *ʔʌ̂w siŋ-kjɔh* ***tʌʔ*** *tâ sra ʔʌ̂w*
1SG DES-speak OBL master teacher 1SG
'I want to speak with my teacher.' (WPKT_14_L_025)

Another group are verbs of feelings or emotions where the second argument is usually marked by *tʌʔ* (16, 17).

(16) *ʔân nɔh dôŋ kʰâj* ***tʌʔ*** *ɟûŋ ʔân*
3SG mind long very OBL work 3SG
'He is very patient about his work.' (WPKT_14_L_386)

(17) ***tʌʔ*** *cʰeh hméə mâj giːj-nəhlɔh*
OBL person which 2SG IPFV-yearn
'Who do you yearn for?' (WPKT_14_L_031)

The verbs presented in this subsection are the most frequently occurring in the corpus taking a P argument marked by *tʌʔ*. More research is needed on this topic.

2.2 Locative **pʌʔ**

The locative marker *pʌʔ* mainly introduces adjuncts, but it is also used to introduce headless relative clauses where it can be translated as 'a place where one Vs'.

2.2.1 Adjuncts

In adjuncts, *pʌʔ* indicates direction (18, 19) as well as location (20).

(18) *tɔ̂ːn səŋâj ʔʌ̂w hâːw* ***pʌʔ*** *cʰôŋ*
every sun 1SG go LOC school
'Everyday I went to school.' (W2_15_M_3_009)

(19) *kəɟɔj kʰʌŋ ʔʌ̂w ɟok pədêən* ***pʌʔ*** *kəlah*
help POL 1SG lift table LOC market
'Please, help me to bring a table from the market.' (WPKT_14_L_161)

(20) *ʔʌ̂w gɔ̂ːj* ***pʌʔ*** *ʔɯn.juh pʰədɛn hlʌ̂ŋ kûŋ ʔɐ̨əm.kʰrî*
1SG stay LOC village PN city state Namhkam
'I live in Pha Dan village, Namhkam township.' (WPKT_14_L_008)

pʌʔ is also used with personal pronouns (21) and demonstratives (22).

(21) *nʌŋ-bɤ̌n lʌh deəh* ***pʌʔ*** *mâj ʔɯŋ.hŋjê*
IRR-get Q come LOC 2SG tomorrow
'Can I come to you tomorrow?' (WPKT_14_L_064)

(22) *ʔɯn.dʌ̂ːn pen di* ***pʌʔ*** *nɤ̌j dih*
way good place LOC UP SFP
'The road is good up there, isn't it?' (C3_17_MS_3_096)

The construction *pʌʔ hméə* (LOC which) means "where" (23).

(23) ***pʌʔ*** *hméə mâj siŋ-hâːw*
LOC which 2SG DES-go
'Where do you want to go?' (WPKT_14_L_029)

2.2.2 S and P arguments 'a place where one Vs' (headless relative clauses)

Headless relative clauses don't contain a noun, and they don't modify a noun or a pronoun (Dryer 2007:197). In Rumai, they are verb-initial like other relative clauses, and they are used as adjuncts (24), S arguments (25) or P arguments (26).

(24) *jê* *hâːw* [***pʌʔ*** *kʰʌ̀* *ʔî*]
1PL.EXCL go LOC marry others
'We go to the wedding (the place where others marry) of other people.' (I_17_MS_7_031)

(25) [***pʌʔ*** *kɤ́t* *ʔʌ̂w*] *moh* *kəɟôŋ* *nam.cak* *kûŋ* *namkʰam*
LOC born 1SG be.so village PN city Namhkam
'My birth place (the place where I was born) is Namcak village, Namhkam township.' (I_15_M_3_010)

(26) *ʔêw-meəh* [***pʌʔ*** *nʌŋ-ɟɤ̌h*]
1PL.INCL.NEG-exist LOC IRR-buy
'We don't have (a place) where (we) could buy something.'
'We don't have a shop/market.' (C3_17_MS_3_199)

2.3 Complementizer lʌʔ

The main function of the complementizer *lʌʔ* is to introduce complement clauses. Furthermore, there are the two preverbal secondary verbs *bɤ̂n* 'get' and *bɛ* 'can' where the following primary verbs often are preceded by *lʌʔ*. These clauses can also be interpreted as complement clauses. In existential clauses, the S arguments, and in possessor phrases without head noun, the pronouns or nouns are marked by *lʌʔ*.

2.3.1 Complement clauses

With several ditransitive verbs, the P argument can be a complement clause marked by *lʌʔ*. Among them are *jʌ̂w* 'fear' (27), *kəkâːm* 'plan' (28), and *caʔ* 'start' (29).

(27) *kʰʌ* *mâj* *jʌ̂w* [***lʌʔ*** *gɔ̂ːj* *tʌŋ* *ʔʌ̀* *ʔu* *cʰeh*]
COND 2SG fear COMP stay LOC dark one person
ʔʌ̂w *jaʔ* *ʔûːn* *ʔiʔ* *pʌʔ* *nî*
1SG dare keep sleep LOC PROX
'If you're afraid of being alone in the dark, I can sleep here.' (EGGD_16_M_3_040)

(28) *jê* *kəkâːm* [***lʌʔ*** *rêən* *kʰəleəp* *pəkjɤ̂* *bʌ̂ːn*]
1PL.EXCL plan COMP do house moon back
'We plan to build a house next month.' (WPKT_14_L_264)

(29) *ja* *caʔ* [***lʌʔ*** *kəlâːŋ* *ʔəpom*]
grandmother start COMP tell story
'The old woman started to tell a story.' (EMSR_19_M_3_009)

2.3.2 Preverbal secondary verbs

The two preverbal secondary verbs that are discussed here, both belong to the modality domain. While both can express a simple possibility, *bɤ̂n* 'get' often has the function of a permission like in (30), and *bɛ* 'can' one of an inherent ability like the physical strength in (31).

(30) *ʔàːj* *hɔ̀ːj* *mâj* *tʌʔ* *jûŋ* *mâj* *ʔaːw-bɤ̂n-maʔ* [***lʌʔ*** *hâːw* *pʌʔ* *plɔ̂ːj*]
before finish 2SG OBL work 2SG NEG-get-NEG COMP go LOC festival
'You cannot go to the festival, before you have finished work.' (EMR_19_M_3_105)

(31) *ʔʌ̂w* *bɛ* [***lʌʔ*** *təbuʔ* *kʰjʌ̂ːn*]
1SG can COMP run fast
'I can run fast.' (EC_17_M_3_020)

Not all the verbs that follow the two secondary verbs are preceded by *lʌʔ*, but what triggers the marker is not clear.[5]

2.3.3 S arguments in existential clauses
The S argument in existential clauses is preceded by *lʌʔ* (32).

(32) *kʰâj.təlâj* *dɤ̂* *meəh* ***lʌʔ*** *guh* *bjâj*
long.time.ago ANA exist COMP thick.forest forest
'A long time ago, there was a jungle.' (W1_002)

2.3.4 Possession
To indicate possession, a personal pronoun (33) or a noun directly follows the head noun.
But when there is no head noun, the possessor noun (34) or pronoun (35, 36) is marked by *lʌʔ*.

(33) *kʰʌ* *mâj* *cʌ̂ːm* *pʌʔ* *raːŋguŋ* *deəh* *hlɛ* *pʌʔ* *kʰəleəp* ***ʔɤ̂w***
COND 2SG reach LOC Yangon come visit LOC house 1SG
'If you come to Yangon, come to visit my house.' (EMR_19_M_3_110)

(34) *pʌŋ* *buː-hà* *ʔân* *kiʔ* *dɤ̂* *ʔɯn-tɔ̀* *cʌ̰m* *bô* ***lʌʔ*** *jâ*
REL NEG-eat 3SG NML ANA DUR-include also EMPH COMP missis
cʰeh *pʰlâːn* *dɤ̂*
person poor ANA
'(Those bowls of meat) he didn't eat included also that poor woman's (bowl).'
(WA_15_M_3_083)

In (35), S arguments are marked by *lʌʔ*.

(35) *kiʔ* *dî* *ʔaːw-moh-maʔ* ***lʌʔ*** *mâj* ***lʌʔ*** *ʔʌ̂w* ***lʌʔ*** *mâj*
NML PROX NEG-be.so-NEG COMP 2SG COMP 1SG COMP 2SG
ʔɯm-hmêəm *kədih* *kʰu* ***lʌʔ*** *ʔʌ̂w*
DUR-abundant dirty COMPAR COMP 1SG
'These (shoes) aren't yours; they are mine. Yours are much dirtier than mine.'
(EMSR_19_M_3_035)

In (36), *lʌʔ* marks a P argument.

(36) *teəh* *mâj* *buː-meəh* *teəh* *mâj* *cʰeəp* ***lʌʔ*** *ʔʌ̂w*
take 2SG NEG-exist take 2SG wear COMP 1SG
'If you don't have any (clothes), you can take mine.' (WPKT_14_L_039)

2.4 Combinations of the markers
There are some occurrences of combinations of the markers. Both *tʌʔ* and *lʌʔ* are used as first elements together with the other two markers. This results in combinations of *tʌʔ pʌʔ*, *tʌʔ lʌʔ*, *lʌʔ tʌʔ*, and *lʌʔ pʌʔ*. The combinations with the first element *tʌʔ* usually occur in verb-initial dependent clauses, where *tʌʔ* generally marks G, P, and T arguments. The picture for combinations with *lʌʔ* is less clear.

[5] For a discussion on this feature and more information about secondary verbs in Rumai, see Weymuth 2023.

2.4.1 tʌʔ pʌʔ

In example (37), *tʌʔ pʌʔ* occurs in a relative clause, and in (38) in a temporal clause. In these clauses, *pʌʔ* is expected with the locations, while *tʌʔ* may be the common marker for P arguments in verb-initial clauses, but this needs more research.

(37) *ʔân teəh vî hâːw pʌʔ kʰəleəp poh hɑ̂ːj plɑ̂ːj bjâj*
3SG take return go LOC house flower wood fruit forest
[*pʌŋ jɤh deəh ʔân* ***tʌʔ pʌʔ*** *kəlah*]
REL buy come 3SG OBL LOC market
'He brings back home the vegetables that he has bought on the market.' (EMR_19_M_3_046)

(38) [*vâːj leh hâːw ʔân* ***tʌʔ pʌʔ*** *lûm jê*] *ʔân*
after descend go 3SG OBL LOC office 1PL.EXCL 3SG
ʔaːw-biʔ-maʔ ploh
NEG-close-NEG door
'After she left our office, she didn't close the door.' (EGGD_16_M_3_161)

2.4.2 tʌʔ lʌʔ

In (39), the complement clause is a P argument, which may explain the presence of *tʌʔ*, which is used to mark P arguments in verb-initial clauses.

(39) *bɤ hɔ̀ːj ʔɑ̂w* [***tʌʔ lʌʔ*** *pətat soho*] *ʔɑ̂w bɤ̂n pɔ̀*
when finish 1SG OBL COMP kill mosquito 1SG get PTCL
lʌʔ ʔiʔ ŋâːm
COMP sleep sweet
'After I had killed all the mosquitos, I could sleep well.' (EGGD_16_M_3_143)

The clause inside the relative clause in (40) is a purposive clause. Purposive clauses are usually introduced by the purposive marker *ca*. The use of *tʌʔ lʌʔ* as in this clause needs more research.

(40) *ɟûŋ* [*rêən mâj* [***tʌʔ lʌʔ*** *hôm*]] *ʔum-pen lʌh dih*
work do 2SG OBL COMP eat DUR-good Q SFP
'The work you do for eating (to eat), is it good?' (C1_17_MS_7_001)

2.4.3 lʌʔ tʌʔ

In the combinations *lʌʔ tʌʔ* and *lʌʔ pʌʔ*, the complementizer *lʌʔ* is always optional. *lʌʔ tʌʔ* is only found after verbs of "saying" where *tʌʔ* is consistently used to mark the addressee (41) (see also (15)).

(41) *ʔân dʌh* ***lʌʔ*** ***tʌʔ*** *ʔərok hɤ̂j kʰu-giːj-ʔɔ̂ŋ*
3SG say COMP OBL frog hey PROH-IPFV-shout
'He said to the frog: "Hey, don't shout!"' (W3_15_M_3_015)

2.4.4 lʌʔ pʌʔ

In (42), *lʌʔ* and *pʌʔ* both are optional. But while locations are mostly marked by *pʌʔ*, the combination of *lʌʔ* and *pʌʔ* rarely occurs in the corpus.

(42) *ʔənaːj ʔân mʌ teəh səna:t teəh pʌŋ hôm*[6] *pʌŋ hà*
first.son 3SG RESTR take gun take REL eat REL eat
hâːw ***lʌʔ*** ***pʌʔ*** *nâ*
go COMP LOC paddy.field
'His first son took a gun and rice and curry to eat and went to the paddy field.'
(W3_15_M_3_011)

3 Discussion

The previous sections show the main uses of the argument markers. In this section, some topics worth a closer look will be discussed.

3.1 Obligatoriness of the markers and variability in translations

Examples (43) and (44) are translations of the same clause. But while in (43), both expected markers, the complementizer *lʌʔ*, and the locative *pʌʔ* are present, they are missing in (44). This shows that the markers are not obligatory. The speaker of (43) is literate in Rumai, while the speaker of (44) is not, and the two speakers come from different townships. This may be a reason for the variation.

(43) *mâj ʔaːw-bɤ̂n-maʔ* ***lʌʔ*** *hâːw* ***pʌʔ*** *plɔ̂ːj pʰəjâ ʔɯŋdih*
2SG NEG-get-NEG COMP go LOC festival temple today
'You can't go to the temple fair today.' (ECC_16_M_3_051)

(44) *mâj ʔaːw-bɤ̂n-maʔ hâːw plɔ̂ːj pʰəjâ ʔɯŋdih*
2SG NEG-get-NEG go festival temple today
'You can't go to the temple fair today.' (ECC_16_M_1_050)

Three different translations of the same sentence of a questionnaire are also found in the following sentences. The translators of (45) and (46) are the same as the ones of the previous two sentences. The third consultant (47) comes from the same township as the first one, but from a different valley. He is not literate in Rumai. While all expected markers are present in the sentences, the translations show some differences.

The translation back into English of example (45) is approximately 'He asked them for a blanket, and he got it.' Here, we have two coordinate clauses, and the G argument in the first one is marked by *tʌʔ*.

(45) *ʔân hmâːn heəp* ***tʌʔ*** *kɛ̂ ʔân bɤ̂n ʔûːn*
3SG ask.for blanket OBL 3PL 3SG get keep
'He asked and got a big blanket from them.' (EGGD_16_M_3_128)

For examples (46) and (47), the translation is 'He asked to get a (big) blanket from them'. But while in (46) there is a complement clause where the T argument usually is not marked, there is a purposive clause in (47), introduced by the purposive marker *ca*, and including a T argument marked by *tʌʔ*. Assuming that the P and T arguments are only marked in verb-initial clauses the complement clause in (46) is verb-medial, and the A argument (3SG) cannot be inserted after the verb *bɤ̂n* 'get', while this would be possible in (47). More research on this is needed.

(46) *ʔân hmɔ̀* ***lʌʔ*** *bɤ̂n heəp dâːŋ* ***tʌʔ*** *kɛ̂*
3SG ask COMP get blanket big OBL 3PL
'He asked and got a big blanket from them.' (EGGD_16_M_1_129)

[6] *hôm* is the general word for 'eat', especially for eating rice, while *hà* is used for eating anything else like fruits and vegetables.

(47) *ʔân* *ʔə-hmɔ̀* ***ca*** *hnâːŋ* *bɤ̂n* ***tʌʔ*** *heəp* ***tʌʔ*** *kɛ̂*
3SG INCEP-ask PURP so.that get OBL blanket OBL 3PL
'He asked and got a big blanket from them.' (EGGD_16_L_6_130)

3.2 Marking of P and T arguments in verb-initial clauses

There is the question, why the P (48) and T arguments in verb-initial clauses are marked by the oblique marker *tʌʔ*, but not in verb-medial clauses.

(48) *ʔəkʰjɯŋ* *vɤh* *ʔân* ***tʌʔ*** *təpɛn* *ʔân* *jêəw* *hân*
time open 3SG OBL box 3SG see snake
'When he opened the box, he found a snake (inside it).' (ENS_16_M_1_119)

A possible explanation is the constituent order, as there is a universal tendency in languages with verb-initial or verb-final constituent order to mark the arguments (Anderson 2020:188), probably for an easier identification of their functions. In Rumai, the basic constituent order is verb-medial, but most of the dependent clauses are verb-initial. Dependent clauses are more conservative than independent clauses (Bybee 2001), and the original order in Rumai therefore may have been verb-initial. This hypothesis is supported by the structure of negation marking in Rumai (Weymuth 2018:95). Furthermore, Jenny (2020) claims that the Proto-Austroasiatic clause can be reconstructed with a verb-initial or predicate-initial structure.

3.3 Variation

While *tʌʔ* and *pʌʔ* are consistent in their form in the corpus, *lʌʔ* is sometimes replaced by *dʌʔ* (49).

(49) *buːhlʌ̂ːn* *dâːŋ* *kɛ̂* *jʌ̂w* *kʰâj* ***dʌʔ*** *jʌ̂ːm*
NEG-long big 3PL fear very COMP die
'They will soon be very afraid to die.' (EMR_19_M_3_027)

This replacement may be dialectal, but more research is needed.

4 Summary

The Rumai argument markers include the oblique marker *tʌʔ*, the locative marker *pʌʔ*, and the complementizer *lʌʔ*. For their main functions, Table 1 is here repeated as Table 2.

Table 2: *Main functions of the Rumai argument markers*

Marker	**Functions** (marking)
Oblique *tʌʔ*	G arguments
	P and T arguments in verb-initial dependent clauses
	P arguments with certain verbs
Locative *pʌʔ*	Adjuncts
	S and P arguments 'a place where one Vs'
Complementizer *lʌʔ*	P arguments (complement clauses)
	S arguments in existential clauses
	Possession without head noun

While the oblique marker *tʌʔ* seems to be used consistently, the locative marker *pʌʔ* and the complementizer *lʌʔ* are sometimes omitted. Furthermore, there is great variability in expressing the same meaning of a sentence.

The assumed original verb-initial constituent order in Rumai is probably the source of the marking of the P and T arguments in contemporary verb-initial clauses.

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Appendix: Information on sources of data

Structure of the data labels

1. Short name: shortcut_year_place of recording/edition
2. consuntant(s)/author_example in toolbox
3. pc_X: personal conversation with consultant X

First letter of the shortcuts:

C	conversation
E	elicitation
I	interview
W	written text

Places:

L	Lashio
M	Mandalay
MS	Man Sat (Nam Hkam township)

Sources of the examples

Short name	Description
C1_17_MS	Conversation about tea and rice cultivation in a village
C3_17_MS	Conversation about the life in a village
EC_17_M	Questionnaire comparison, English
ECC_16_M	Questionnaire causative constructions, Burmese/English
EGGD_16_M/L	Questionnaire about the use of "give" and "get" and about ditransitive constructions, English
ENS_16_M	Questionnaire "new situation", Burmese/English
EMR_19_M	Questionnaire resumptive pronoun, Burmese

EMSR_19_M	Questionnaire subordinate clauses, Burmese/English
I_15_M	Interview of a young woman with a monk
I_17_MS	Interview of a monk and two villagers about their life in the village
WA_15_M	Sentences containing aspectual markers from: Sa Pe. 2015. *bjat gôːj kʰêəŋ bèə* [Being clever with texts]. Mandalay: Self-publishing.
WPKT_14_L	Phrase book Rumai – Shwe – Burmese – English. 2014. Lashio: Ta'ang Students and Youth Union.
W1	Story in *Our Ta'ang magazine*
W2_15_M	Short story in: Sa Pe. 2015. *bjat gôːj kʰêəŋ bèə* [Being clever with texts]. Mandalay: Self-publishing, pp. 78-79.
W3_15_M	Short story in: Sa Pe. 2015. *bjat gôːj kʰêəŋ bèə* [Being clever with texts]. Mandalay: Self-publishing, pp. 48-49.
W4_15_M	Short story in: Sa Pe. 2015. *bjat gôːj kʰêəŋ bèə* [Being clever with texts]. Mandalay: Self-publishing, pp. 38-39.

Consultants

Nr.	Gender	Y.o.b	Origin	Education	Occupation	Languages
1	f	1996	Na Aw Gyi village Man Ton township		student	Rumai, Burmese, English
3	m	1988	Man Sat village Nam Hkam township	Bachelor diploma	monk	Rumai, Burmese, English, Pali
6	m	1993	Sar Lu village Nam Hkam township		student	Rumai, Burmese
7	f	1959	Man Sat village Nam Hkam township	Primary school in Shan	housewife, farmer	Rumai, Shan, (Burmese)

CAN VOWEL HEIGHT AND ONSET DURATION CUE PROMINENCE IN MUNDARI?[1]

Luke HORO, Gregory D. S. ANDERSON, & Pamir GOGOI
Living Tongues Institute for Endangered Languages
luke.horo@livingtongues.org, gdsa@livingtongues.org, pamirgogoi11@gmail.com

Abstract
We examine a range of potential cues of prominence in Mundari, a Kherwarian Munda language. We tested acoustic cues of prominence such as duration, intensity and fundamental frequency of monosyllabic, disyllabic and polysyllabic words. While duration appears to correlate well with phrasal or utterance boundaries, none of these three acoustic cues showed statistically significant patterns in signaling prominence. We then tested two other segmental cues, specifically the height of mid-vowels and the duration of onset consonants in monosyllabic and disyllabic words. It turns out that these segmental cues may correlate better as signals of prominence in Mundari. However, it appears that Mundari is among the Austroasiatic languages that does not offer justification for the level of phonological word, while levels below and above that in normal prosodic architecture can be so justified.

Keywords: Prominence, Acoustics, Consonants, Vowels, Mundari
ISO 639-3 codes: unr (Mundari) unx (Munda)

0 Introduction
This study investigates whether segmental realizations can provide an explanation of prominence marking in Mundari. Mundari is a Kherwarian North Munda language spoken in Jharkhand, Odisha, Chhattisgarh, West Bengal, Assam and Nepal. The official census data has separate entries for Munda and Mundari as "Mother Tongue" but they are two variants of the same thing. There are four named 'dialects' traditionally reckoned among the community: Hasadaʔ, Naguri, Keraʔ and Tamaɽia. Other Kherwarian languages like Ho and Bhumij (likely Asuri, Koda, etc., too) could be considered linguistic dialects of Mundari. Existing literature on the Mundari prominence system is conflicting. Analysis of the acoustic cues of prominence in Mundari reveal that those systems are not robust.

Donegan and Stampe (1983, 2004; Donegan 1993) suggested all Munda languages were trochaic but Horo (2017); Horo et al. 2020, Horo et al. 2023 show Sora is second syllable prominent. Horo and Anderson (2021, 2022) show Assam Santali is also second syllable prominent, instrumentally and statistically supporting claims by Ghosh (2008) about Santali of West Bengal. So, not all Munda languages show evidence of ever having been trochaic and thus some have remained iambic. But this does *not* mean that *no* Munda languages show trochaic patterns, however. Nor are the acoustic cues consistent across all Munda languages, e.g., the primary cue is intensity in Sora but duration in Assam Santali.

We present experimental data on Mundari, we first start with a presentation of our analysis of whether any of the cues of duration, intensity or fundamental frequency of a vowel yields any insight into whether the first or second syllable (or last or any other) in Mundari disyllables and polysyllables might be more prominent than (the) other(s) acoustically. We then turn to a presentation attempting to answer the question of whether segmental information might rather correlate in some way to specific syllable distributions. It is the findings of this specific study that we report on here.

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1 Methodology

In the following subsections we briefly outline the methodology used in the current study. In § 1.1 we detail the dataset the analysis is based upon, and in § 1.2 the speakers we introduce who provided speech data for this study and in § 1.3 we mention the procedure and context of the recordings. Section 1.4 briefly details the formal calculus.

1.1. Lexical Dataset

The text data consisted of uninflected nouns and verbs having 400 disyllables and 200 monosyllables (See Table 1 for sample dataset). The dataset is curated from an existing Mundari lexicon documented in Hoffman (2001). Subsequently, the text data was recorded during fieldwork in the Khunti district of Jharkhand. The recording was conducted outdoors under a noise-controlled environment. A Tascam Linear PCM recorder was used, connected to a Shure head-worn unidirectional microphone.

***Table 1**: Mundari Sample Dataset*

Mundari	**English**	**Syllable Structure**
ne	give	CV
nir	run	CVC
abu	we	V.CV
ipil	star	V.CVC
buʈi	navel	CV.CV
doŋga	boat	CVC.CV

1.2 Speaker Metadata

The text data was recorded from a total of ten Mundari speakers, six male and four female having an average age of 28 years with 15 years of standard deviation. All the participants were native speakers of Mundari, and bilingual speakers of Hindi. Out of ten speakers, three female and one male speaker were pursuing their post-graduate studies at the time of recording, three male speakers were in their undergraduate studies, one male speaker had completed high school, and one male and one female speaker were high school dropouts. This presentation reports the findings obtained from analyzing the speech data of two male and two female speakers only.

1.3 Recording Procedure

The production task was achieved by providing the prompts in Hindi to which the speakers responded with the target words in Mundari. If the speakers failed to recall the target words, Mundari was used to explain the context and cue the target word, without providing any auditory cue for the target form of the word. During the production task the speakers were instructed to produce the target words first in isolation and then in three different intonation contexts including (1) a simple carrier phrase, (2) an out of focus sentence frame and (3) an exclusive focus sentence frame.

(1) Context 1 (Phrasal)

bikram _____ *kadʒime* 'Bikram, say _____'
bikram _____ *kadʒi=me*
Bikram _____ say=2SG

(2) Context 2 (Non-Focal)

bikram _____ *kadʒime surdʒan do ka* 'Bikram, say _____, not Surjan'
bikram _____ kadʒi=me surdʒan do ka
Bikram_____ say=2SG Surjan TOP NEG

(3) Context 3 (Focal)

bikram _____ *kadʒime dʒohar do kage* 'Bikram, say _____, not johar'
bikram _____ kadʒi=me dʒohar do ka-ge
Bikram_____ say=2SG greetings TOP NEG-EMPH

1.4 Acoustic Measurements

The speech data was manually annotated in Praat by trained phoneticians for word, syllable and phoneme boundaries. The vowel phonemes were annotated between the beginning and the end of glottalic pulses having steady state formants. The sonorants were annotated between the beginning and end of glottalic pulses having amplitudes lower than vocalic segments and the obstruents were annotated between the oral constrictions identified by lack of speech signal for voiceless stops and by noisy friction for voiceless fricatives. The consonants were analyzed to determine consonant duration in the onset position of the first and the second syllable of disyllabic words in Mundari. Also, consonant duration in onset position were measured from target words that were produced in the three intonational contexts but not from the words that were produced in isolation. The acoustic analysis of vowels is based on their first and second formant frequencies F1 and F2, extracted at vowel midpoint. Additionally, Euclidean distance between vowel segments was estimated using the equation in (4).

(4) $$d_{xy} = \sqrt{(F1_x - F1_y)^2 + (F2_x - F2_y)^2}$$

Euclidean distance is a straight-line distance between two points in any given space. In case of vowels, it represents the dispersion between vowel segments in a vowel acoustic space. In equation (4) the Euclidean distance (d_{xy}) between two vowel segments *x* and *y* is estimated by taking their first and second formant frequencies F1 and F2. The Euclidean distance between each vowel pair in the Mundari vowel system was calculated separately for vowels occurring in the first syllable and vowels occurring in the second syllable of the disyllabic words. Also, the vowel acoustic space of the Mundari vowel system was calculated separately for the vowels occurring in the first syllable and the vowels occurring in the second syllable. To calculate the vowel acoustic space, the vowel inventory is divided into three triangular parts, each representing a vowel triangle such as /i-e-u/, /e-o-a/ and /u-e-o/. Then, the area of each vowel triangle is calculated using the equation in (5).

(5) $$area = \sqrt{s(-a)(s-b)(s-c)}$$

In equation (5) *a, b* and *c* represent the Euclidean distance of the three sides of a vowel triangle, e.g. in the vowel triangle /i-e-u/, *a* is the Euclidean distance between /i-e/, *b* is the Euclidean distance between /e-u/ and *c* is the Euclidean distance between /i-u/ and *s* is the summation of *a, b* and *c*. Vowel space area of the vowel system is then calculated by adding the area of the three vowel triangles.

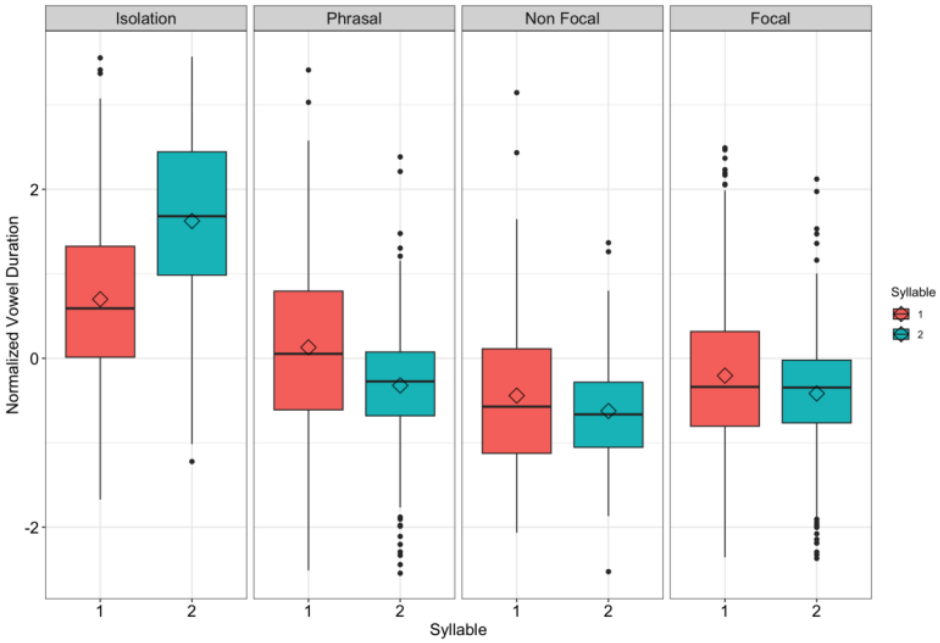
2 Prominence in Mundari disyllables: Acoustic Cues

Preliminary work examining the acoustic cues of prosodic prominence in Mundari (Horo et. al 2023) suggests that there are no robust acoustic cues of prosodic prominence in Mundari disyllables. Indeed, the three acoustic cues of prominence namely vowel duration, vowel intensity (Fry, 1955, 1958) and fundamental frequency (Baumann et al. 2016) do not show a clear prominence pattern in Mundari disyllables. The following subsections briefly recapitulates the inconsistencies observed in Mundari disyllables with respect to acoustic cueing of prosodic prominence.

2.1 Vowel duration in Disyllables

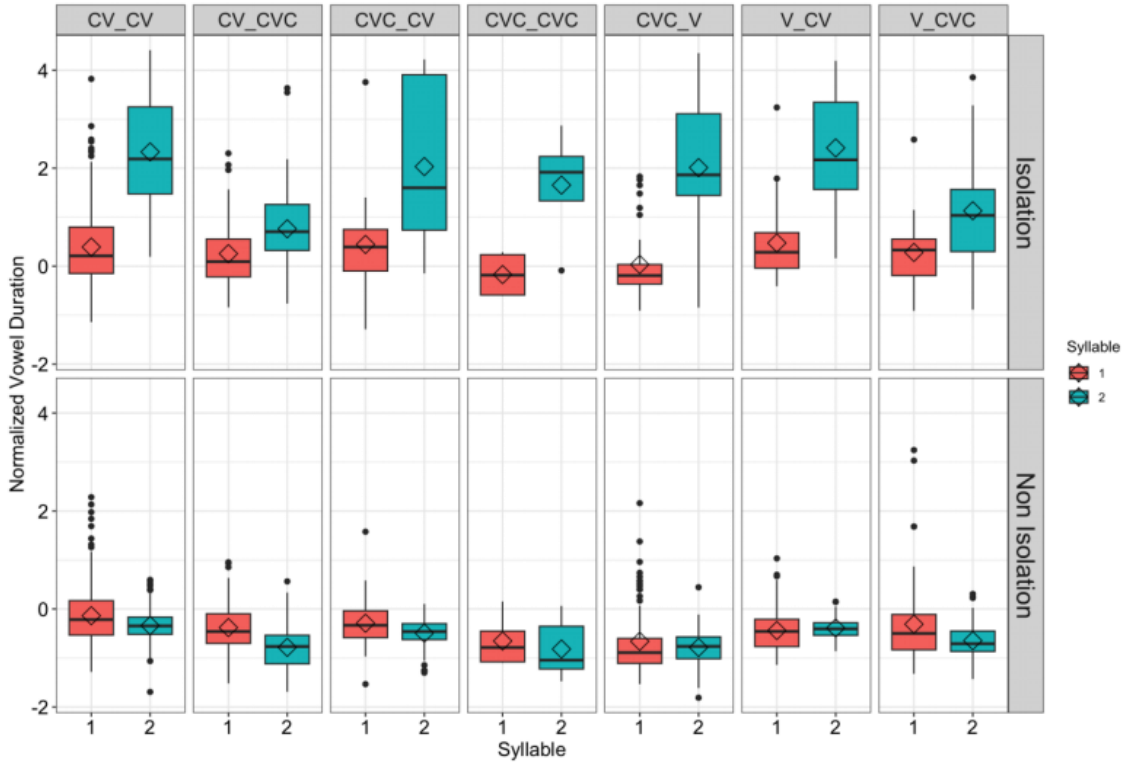
Longer vowel duration is a common acoustic correlate of prominence marking in languages that distinguish between prominent and non-prominent parts of a speech utterance. In Mundari disyllables, evidence suggests that longer vowel duration is associated with final lengthening indicating that phonetically long vowels occur at the end of an utterance. Figure 1 shows the vowel duration difference between first and second syllable in Mundari disyllables when they are produced in isolation and in three other intonation contexts.

Figure 1*: Vowel duration in first and second syllable of disyllables produced in isolation and in three different intonation contexts*



In Figure 1, speaker normalized values of the absolute length of the vowel nucleus in the first and the second syllable of disyllabic words produced in isolation, phrasal, non-focal and focal contexts are plotted together. It is evident that in Mundari disyllables vowel duration is longer in the second syllable only when the words are produced in isolation. Whereas, when the disyllables are produced in a carrier phrase, in an out of focus and in an exclusively focused sentence, the second syllable in the disyllabic word is not lengthened since it is not in the utterance final position. Additionally, considering that syllable structure can affect vowel duration, a follow-up analysis was done to examine vowel duration differences in first and second syllables of disyllabic words having different syllable structures. Figure 2 shows the speaker normalized vowel duration of first and second syllable in Mundari disyllables separated by syllable structure and grouped by contexts of utterance.

***Figure 2**: Vowel duration in first and second syllable of disyllables separated by syllable type and contexts of utterance*



The results show that irrespective of syllable structure vowel duration is longer in the second syllable of disyllabic words when produced in isolation. On the other hand, in case of disyllables produced in controlled intonational contexts, the second syllable lengthening is found to be lacking. Thus, the evidence suggests that prosodic lengthening in Mundari disyllables is not quantity sensitive, but rather positional, marking the final syllable of an utterance whether that syllable is light or heavy.

2.2 Vowel Intensity in Disyllables

Loudness or higher vowel intensity is a widely used feature in languages to indicate salience or prominence in speech utterances. A louder utterance is auditorily distinguishable from a softer utterance and higher amplitude in speech is detectable from the increased acoustic energy of the speech signal. In case of Mundari disyllables, the analysis of vowel intensity across first and second syllables shows that there is no robust separation of intensity values in the two syllable positions. Figure 3 shows the speakers normalized average vowel intensity differences between first and second syllable of Mundari disyllables when they are produced in isolation and in the three prosodically controlled sentence contexts.

***Figure 3**: Vowel intensity in first and second syllable of disyllables produced in isolation and in three different intonation contexts*

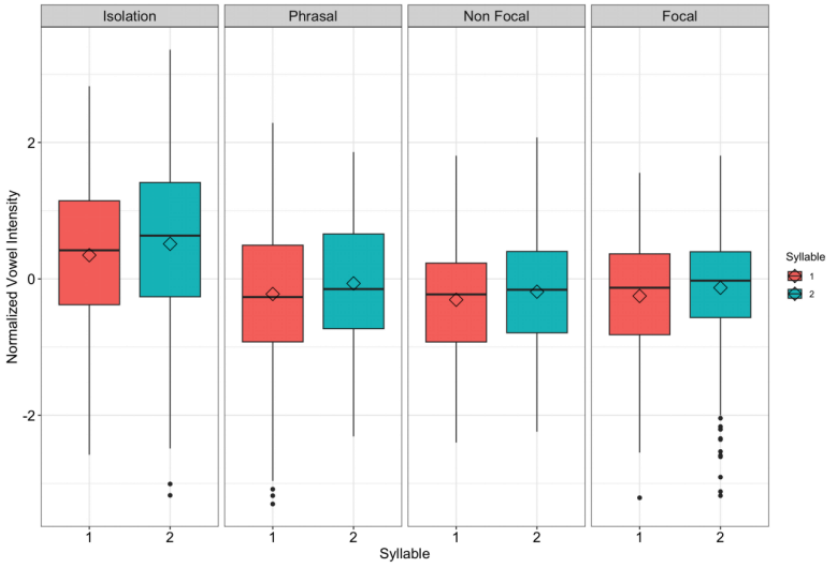
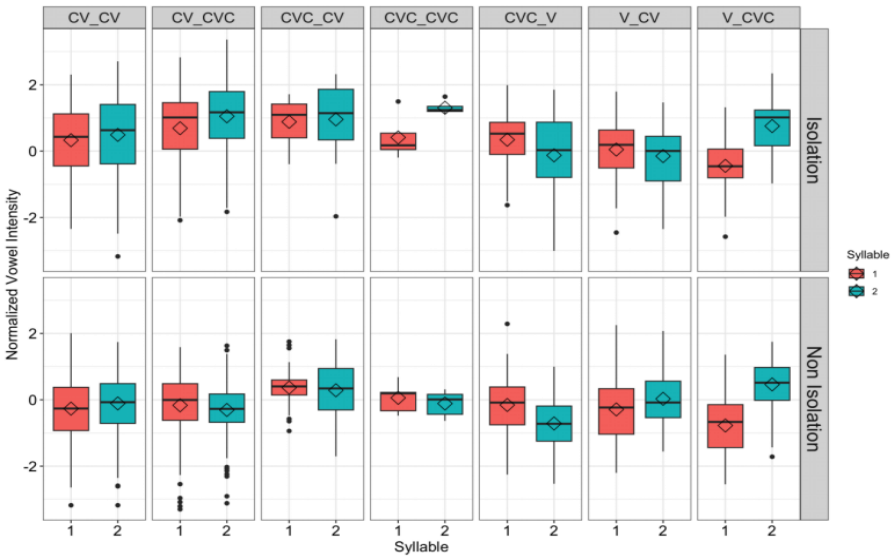


Figure 3 shows that there is no significant difference between the average vowel intensity in the first and the second syllable of the disyllabic words. Average vowel intensity in the first and second syllables of disyllabic words are observed to be within the same range. Also, the context of utterance does not appear to have any bearing on the acoustic energy of the vowel nuclei in the two syllable positions, except that disyllables can have marginally higher amplitude in isolation than in the controlled sentences. Moreover, the data was further analyzed to explore the correlation between vowel intensity and the syllable structure of disyllables. Figure 4 shows the speaker normalized average vowel intensity in the first and second syllable of Mundari disyllables separated by syllable structure and grouped according to the context of utterance.

***Figure 4**: Vowel intensity in first and second syllable of disyllables separated by syllable type and contexts of utterance*



From Figure 4 it is evident that there is no robust difference between the average vowel intensity values in first and second syllable of Mundari disyllables except in case of disyllables having a final heavy syllable which is preceded by an initial light syllable, as in the word *ipil* meaning star, where the second syllable is observed as having higher vowel intensity in isolation as well as in the prosodically controlled

sentence frames. However, in case of disyllables having two heavy syllables, as in the word *hondʒar* meaning 'father-in-law', the second syllable is found to have higher vowel intensity only when the words are produced in isolation but not when the words are produced in prosodically controlled sentence frames. Thus, from the data at hand it is still unclear whether average vowel intensity measurements can systematically separate prominent and non-prominent syllables in Mundari disyllables or not.

2.3 Fundamental Frequency in Disyllables

Languages are known to have pitch variation across syllable positions whereby high pitch in contrast to low pitch is commonly associated with prominence marking. In the acoustic parameter, high pitch is represented by high fundamental frequency or high *f*0. The analysis of Mundari disyllables suggests that average *f*0 difference between first and second syllable is more pronounced when the disyllables are produced in the prosodically controlled sentence frames but not when they are produced in isolation. Figure 5 shows the speaker normalized average *f*0 differences between the first and second syllable of Mundari disyllables when they are produced in isolation and when they are produced in the three different intonational contexts.

***Figure 5**: Mean F0 in first and second syllable of disyllables produced in isolation and in three different intonation contexts*

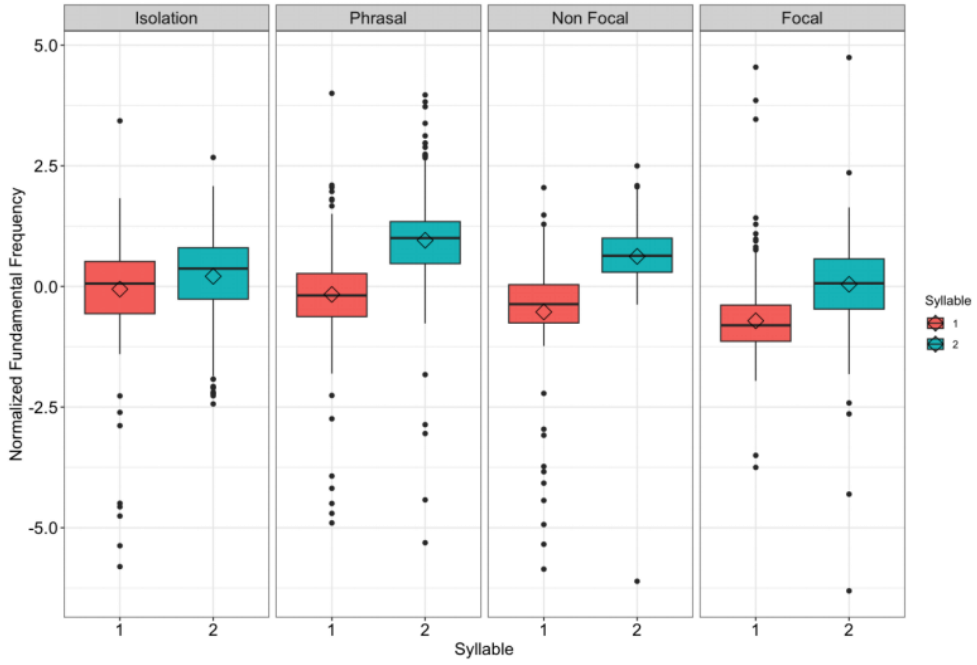
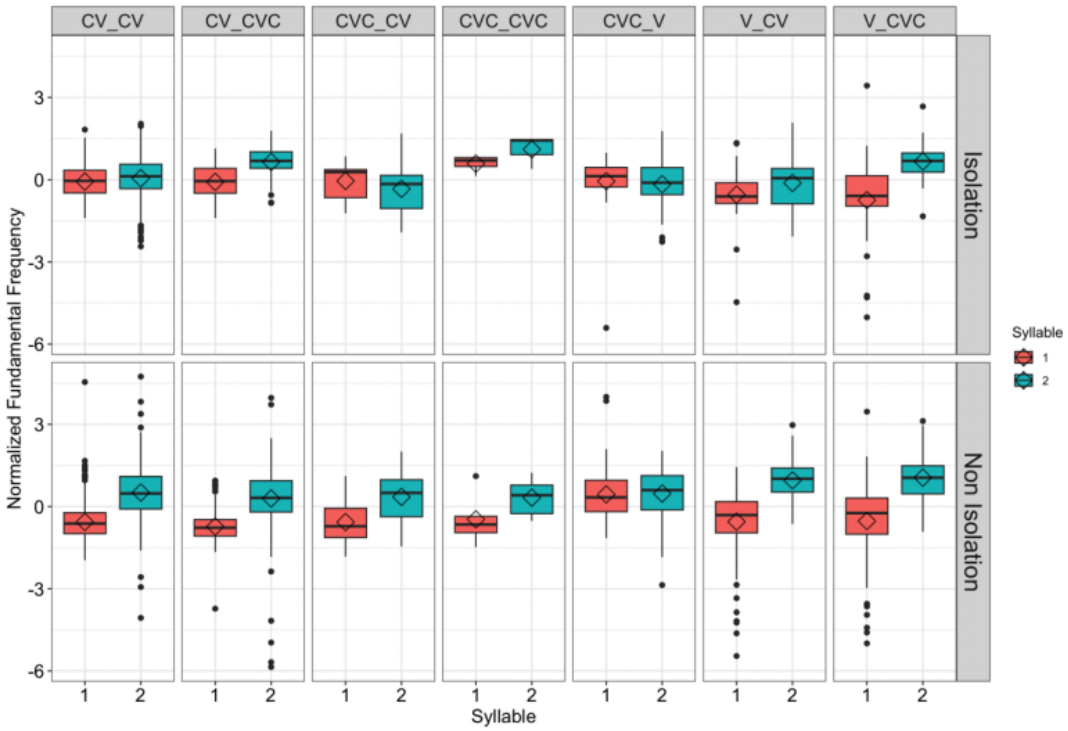


Figure 5 shows that in Mundari disyllables average *f*0 is higher on the second syllable. However, while the *f*0 difference is only marginal in words produced in isolation, it is observed to be significantly increased in the words produced in the controlled phrase and sentence frames. This indicates that the declaratives in Mundari can have an initial rising intonation, and that the phrasal and sentential intonations are superseding the *f*0 contour of the target disyllables. A similar pattern is observed when the disyllables are separated according to their syllable structures in Figure 6.

***Figure 6**: Mean F0 in first and second syllable of disyllables separated by syllable type and contexts of utterance*



From Figure 6 it is observed that Mundari disyllables predictably have higher *f*0 on the second syllable when the words are produced in a controlled phrase or in a sentence frame except for words having a glottal consonant /ʔ/ in coda position of the first syllable followed by a super light echo vowel in the second syllable as in the word *beʔe* meaning 'to spit'. In such cases it is observed that *f*0 difference in the two syllable positions is neutralized. On the other hand, in the case of words produced in isolation, it is found that a second heavy syllable can attract higher *f*0 which otherwise is not found to be very pronounced in other syllable combinations. Thus, the *f*0 measurements also do not robustly distinguish between prominent and non-prominent syllables in Mundari disyllables.

3 Prominence in Mundari Disyllables: Segmental Cues

From the acoustic analysis of prominence in Mundari disyllables it observed that Mundari speakers are less likely to use overt phonetic means to cue prominence in disyllabic words. Therefore, to further investigate prominence in Mundari disyllables we explored the segmental realizations in different syllable positions. Segmental cues of prominence (Cho & Keating 2001, Keating et al. 2004, Cho et al. 2007) that might be relevant to Mundari prominence include consonant onset duration and the height of mid-vowels. Analysis of onset consonant duration and the height of mid vowels in the disyllabic words show that there can be potential variation as an effect of syllable position. The following subsections present the findings in detail.

3.1 Consonant Onset Duration

The analysis of consonant duration in the onset positions of first and second syllables in Mundari disyllabic words reveals that onset consonant durations can vary in the two syllable positions and the variation is related to the voicing feature of the onset consonants. Figure 7 shows the variation between onset consonant duration in first and second syllables of Mundari disyllabic words when the words are produced in embedded sentences which are also prosodically controlled.

***Figure 7**: Consonant duration (ms) of voiced and voiceless stops in onset position of first (O1) and second (O2) syllable of disyllabic words (Contexts 1 = Carrier Phrase, Context 2 = Non-Focal, Context 3 = Focal)*

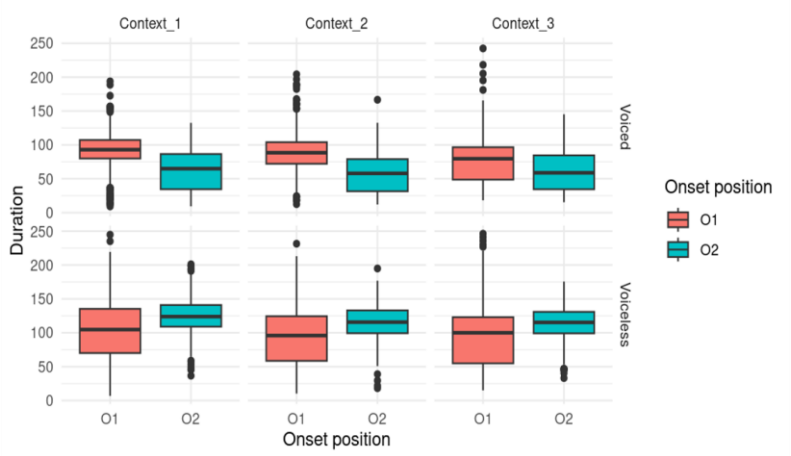


Figure 7 reveals that onset consonant duration is longer in the first syllable when the onset consonant is a voiced segment, whereas for voiceless segments a longer onset consonant duration is found on the second syllable. Significantly, the pattern is observed to be consistent even with different consonantal categories in the two onset positions. Figure 8 shows the onset consonant duration difference in the first and second syllable of Mundari disyllables having different consonant segments in the two onset positions.

***Figure 8**: Consonant duration in onset position of first (O1) and second (O2) syllable of disyllabic words across different segmental categories. (Contexts 1 = Carrier Phrase, Context 2 = Non-Focal, Context 3 = Focal)*

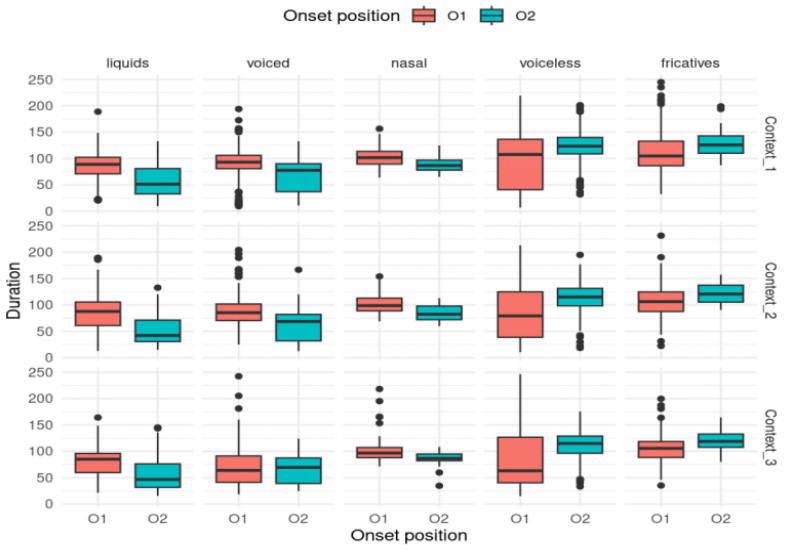
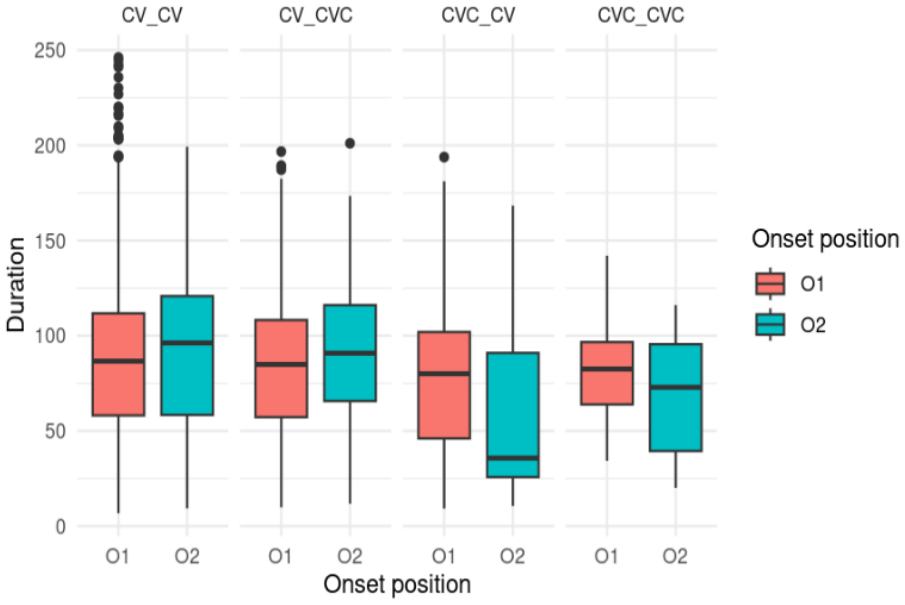


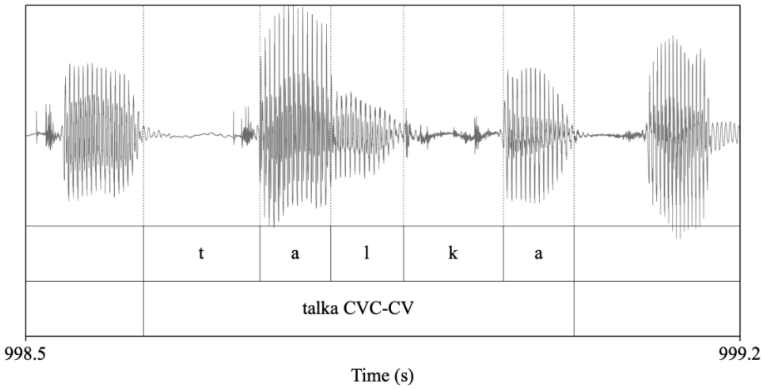
Figure 8 shows that canonically voiced consonants such as nasals and laterals are longer in the onset position of the first syllable like voiced stop consonants. On the other hand, both voiceless stops and voiceless fricatives are found to be longer in the onset of the second syllable. This confirms that onset consonant duration in Mundari disyllables varies because of syllable position and the variation is also related to the voicing feature of the consonant segment. Additionally, a follow-up investigation of onset consonant duration in disyllabic words separated by syllable structure indicates that onset consonant duration may also be phonotactically affected. Figure 9 shows onset consonant duration in first and second syllables of Mundari disyllables separated by syllable structure.

***Figure 9**: Consonant duration in onset position of first (O1) and second (O2) syllable of disyllabic words having different syllable structures*



The boxplots in Figure 9 exhibit that onset consonant duration in the second syllable is reduced when it follows a coda consonant in the first syllable. The exception is found to be present even in case of disyllables having a voiceless onset consonant in the second syllable as can be seen in the waveform of the word *talka* meaning 'palm' as produced by one native Mundari speaker recorded in this study (see Figure 10).

***Figure 10:** Reduced voiceless stop duration in the onset position of second syllable when followed by a coda consonant in the first syllable*

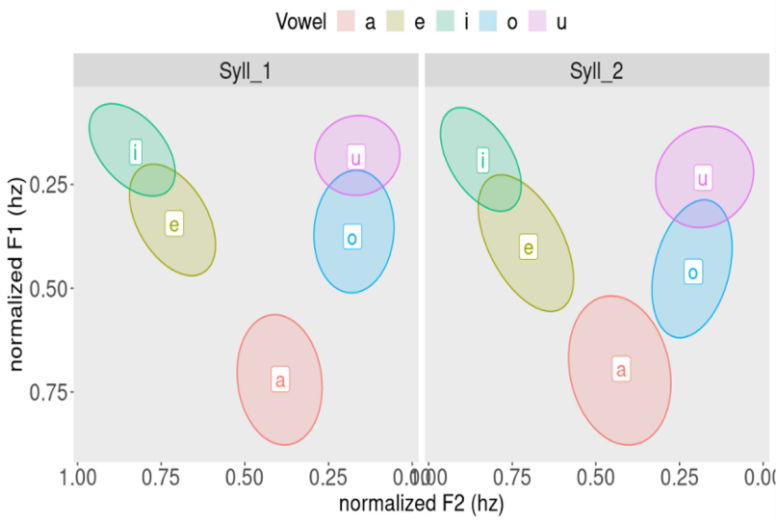


Thus, the analysis of onset consonant duration reveals that the onset consonants have different realizations based on syllable position and that voicing feature as well as phonotactic constraints can affect the syllable specific onset consonant durations in Mundari disyllables.

3.2 Height in Mid-Vowels

Existing studies on the Mundari vowel system suggest that Mundari has five phonemic vowels (Cook 1965; Osada 2008; Gogoi et al. 2024). However, possible phonetic variation in vowel quality can be linked to the interaction between vowel height of mid vowels and syllable position in disyllabic words. This is derived from a comparison of vowels in the first and second syllables of disyllabic words plotted in Figure 11.

***Figure 11**: Mundari vowels in the first and second syllable of disyllabic words (Gogoi et al. 2024)*



The vowel plots in Figure 11 show that both front and back mid vowels in the second syllable are produced lower than their counterparts in the first syllable. This suggests that the mid vowels are more tensed in the first syllable when compared to their counterpart in the second syllable. To compare the vowel dispersion among the vowel pairs in Mundari in the first and second syllable, Euclidean distance between each vowel pair was calculated using the equation in (4) described above and the results are presented in Table 2.

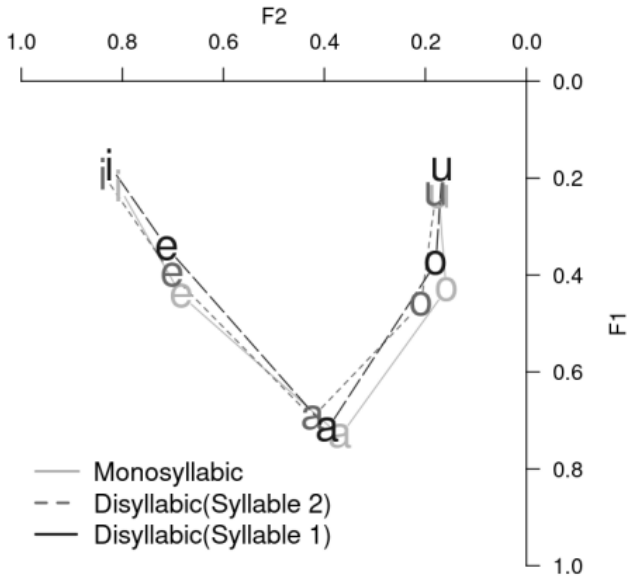
***Table 2**: Euclidean distance between vowel pairs in the 1st and 2nd syllable of Mundari*

	Syllable 1				**Syllable 2**			
Vowel	**/e/**	**/i/**	**/o/**	**/u/**	**/e/**	**/i/**	**/o/**	**/u/**
/a/	683.01	942.16	497.8	582.83	604.65	911.77	473.83	585.88
/e/		259.83	1078.19	1104		309.03	1018.64	1076.74
/i/			1317.93	1332.04			1305.78	1347.29
/o/				126.75				156.26

The Euclidean distance measurement in Table 2 shows that the two mid vowels /e/ and /o/ are more dispersed from the high vowels /i/ and /u/ in the second syllable than in the first syllable. Also, the mid vowels are observed to be more dispersed from the low vowel /a/ in the first syllable than in the second syllable. Thus, the vowel dispersion measurements provide evidence that mid vowels in Mundari are more tense in the first syllable but are laxed in the second syllable.

Additionally, to compare the overall vowel system drawn from monosyllabic words, and from the first and the second syllables of disyllabic words a vowel polygon plot is presented in Figure 12.

***Figure 12**: Vowel space in monosyllabic, and first and second syllable of disyllabic words in Mundari (Gogoi et al. 2024)*



The vowel plot in Figure 12 confirms the variation in mid vowels in the Mundari vowel system which is due to syllable position in disyllabic words whereby the mid vowels are relatively lower in the second syllable in comparison to the mid vowels in the first syllable. Finally, a difference in the vowel acoustic space is also observed in the Mundari vowel system when it is compared across different syllable positions. Table 3 presents the polygon area of the Mundari vowel system calculated separately for the vowels occurring in monosyllabic words, and vowels occurring in the first and second syllables of disyllabic words.

***Table 3**: Polygon area of vowel space in monosyllables and syllable 1 and syllable 2 of disyllabic words*

	Monosyllable	**Syllable 1**	**Syllable 2f**
Polygon area	262816.7	270836.7	254833.5

The polygon area measurement reveals that vowel acoustic space of the Mundari vowel system is largest in the first syllable of disyllabic words and smallest in the second syllable. Hence, the analysis provides evidence that in addition to the variation in the vowel quality of mid vowels, the vowel acoustic space of the Mundari vowel system is also affected by syllable position in the disyllabic words.

4 Discussion

The investigation into word-level prominence in Mundari shows that analysis of typical prosodic features, such as duration, intensity, and pitch, did not produce consistent or reliable markers for word-level prominence in this language. As a result, we shifted our focus to potential segmental cues that might better reflect prominence in Mundari.

Two segmental features were examined: consonantal onset (C-onset) duration and the realization of mid vowels as either lower-mid or upper-mid vowels. These cues offered some insight into prominence patterns, although the results were not entirely conclusive and suggest a more nuanced interaction between segmental and prosodic structures which we will explore further. Both possible cues suggest an iambic pattern, i.e., that the second syllable is more prominent: lower mid-vowels are more distinct, and voiceless onsets are often geminated and therefore longer in second syllables over first syllables while voiced onsets in word-initial position often are prenasalized and thus they are

typically longer than those in second syllables. Our analysis suggests that segmental cues, such as consonantal onset duration and vowel quality, are not fully independent of suprasegmental structures. Instead, it is possible that the segmental and acoustic cues interact and influence prosodic structures. This interplay becomes particularly relevant given the lack of consistent suprasegmental markers for word-level prominence in Mundari.

It is important to note that these findings are based on data from only 4 of the 10 speakers processed so far. With such a small sample size, it is premature to draw any broad conclusions. Despite the limited data set, the observed patterns suggest a need for further investigation into the potential for consistent prominence marking in polysyllabic words. More data is needed to determine if this pattern holds across a larger group of speakers and more complex word forms.

One of the most significant findings of this study is the absence of robust phonological or prosodic features that define the word as a distinct phonological entity in Mundari. Mundari seems to lack prosodic markers at the word level to delineate word boundaries. In disyllabic words, for instance, no prosodic information is used consistently by speakers to process word-level prominence. This leads us to hypothesize that the phonological unit of the word may not exist in Mundari in the same way it does in other languages. Instead, Mundari seems to rely on prosodic structures at other levels, such as the syllable, foot[2], phrase, and utterance, but not at the word level. This aligns with the idea that the word, as a prosodic entity, may not play a significant role in the processing or production of speech in Mundari, further distinguishing it from languages with clear word-level prosodic markers.[3]

In our data, consonantal onset duration appears to exhibit some degree of variation depending on its prosodic position, aligning with the idea that *prosodic strengthening* might be cumulative but *gradual*. Similarly, vowel quality—particularly in the realization of mid vowels—seems to shift subtly between syllables and prosodic positions. This suggests that the absence of clear suprasegmental prominence cues in Mundari leads to a *blending of segmental and suprasegmental features*.

Just as Cho and Keating (2001) observed in their study, we find that segmental cues like consonantal strengthening could be influenced by a *gradient effect of prosodic positioning*, rather than clearly defined categories.[4] This gradient nature, combined with the absence of word-level prosodic markers, creates a complex system in which segmental cues are shaped by broader prosodic structures, resulting in *perturbed* or *mixed cueing* at the word level. This interaction highlights the importance of considering both segmental and suprasegmental features when analyzing prominence in Mundari, as neither operates in isolation.

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[2] Foot is the domain in which the application of high and mid vowel co-occurrence restrictions applies in Mundari (Gogoi, Horo and Anderson 2024).

[3] However, it is not the case that there are no means to delimit 'words' as units *per se* in Mundari, just not phonologically *alone*. Verbs are morphologically complex in Mundari and follow a strict templatic structure with separate templates for perfective, imperfective and imperative forms (Anderson 2007). Subject clitics appear either enclitic to the syllable immediately preceding the initial syllable of the stem or it follows the indicative marker, if present, or appears immediately following the object agreement morphology, if in the imperative, at the very right edge of the verb word, or at both places simultaneously, but never elsewhere, so these positions delimit the verbal grammatical word precisely in Mundari, appearing only at its periphery or being at both loci at the same time in Tamaṛia Mundari (Jora and Anderson 2021, Anderson and Jora 2022). This kind of distribution does suggest that there are some psychologically and phonologically real distinctions between the two potential hosts for the subject clitics, thus 'words' in some sense. Also it has been argued that differences in lexical class such as being a 'lexical content' vs. a 'functional' word may impact the prosodic behavior and realization of the element concerned (Brunelle, Chow and Nguyen 2015), and different syntactic status such as being a noun or a verb (or a head of a DP or TP or whatever terminological/conceptual designation one prefers) can delimit subtypes of 'words' phono-prosodically like the differing stress in nominal and verbal uses of English *permit*.

[4] Cho and Keating (2001) demonstrated that prosodic strengthening does not necessarily occur in discrete steps but rather as a gradient effect across prosodic positions. In their study, linguopalatal contact data showed a continuous distribution of strengthening values, unlike categorical distinctions seen in pre-boundary vowel duration. This gradient strengthening may help explain the mixed cueing system observed in Mundari.

5 Summary

Acoustic cues such as intensity, duration, and fundamental frequency provide mixed results in identifying prominence within Mundari disyllables. However, the current study suggests that vowels are more dispersed and distinct in the second syllable compared to the first. Additionally, consonant duration in onset position is generally longer in the second syllable, except for voiced consonants and when the second syllable onset is preceded by a coda in the first syllable. Thus, there are indications of potential segmental distinctions between the first and second syllables of disyllables. This also manifests in an iambic pattern, where mid vowel quality and consonant duration serves as a cue. Consequently, prominence cued by consonant duration, and maximally contrastive mid vowels are more likely to occur in the second syllable of disyllabic words. Future research will test additional claims made by Osada (2008), including whether the first syllable can be prominent in trisyllabic words and how prominence in second versus third syllables is influenced by the morphemic status of the third syllable. Further investigation is also needed to examine the patterns of vowel lowering in second syllables, consonant duration, and vowel quality in inflected polysyllabic words (three syllables or more), particularly where coda duration varies significantly due to glottalization and creaky voice. Interestingly, domain-end strengthening is not observed in Mundari, as the varied nature of coda duration challenges the generalizability of this phonological feature. Mundari thus appears to have evidence for the notion of 'word' on the grammatical level at least for verbs, which *de facto* includes a phonological sequence that can be also identified as a 'word', but it has no prosodic or phonological features *per se* that delimit the notion of 'word' in the phonological and prosodic architecture of the language,[5] even while levels above and below this level such as foot or utterance can be so delimited.

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PIUMA PAIWAN STRESS IN DIRECTIONAL EVALUATION

Meng-Kai Kyle HO & Kuo-Chiao LIN
Kang Chiao International School
kyleho0619@gmail.com & kuochiao.lin@nyu.edu

Abstract
This paper *directionally evaluates* Piuma Paiwan's (Formosan) stress distribution wherein metrical parsing is quantity-sensitive and shows that directional evaluation works just as successfully for local schwa reduction in Piuma Paiwan. The current analysis is more elegant than previous ones in not calling up alignment and foot binarity constraints.

Keywords: Paiwan, Harmonic Serialism, directional constraints, weight-sensitivity
ISO 639-3 codes: pwn

1 Introduction

Piuma Paiwan (Formosan) has a right-aligned trochee system where stress falls on the penultimate syllable with coda consonants being nonmoraic (1a). However, when the penult's nucleus is a schwa, the schwa undergoes reduction and the stress shifts to the final syllable with vowel lengthening (1b-c) (Shih 2019; cf. Chen 2009a, 2009b; Yeh 2011). Therefore, the schwa in Piuama Paiwan has three variants on the surface: i) nonmoraic [ə] in the non-head position of a foot, ii) bimoraic [əː] in the head syllable of a foot, and iii) monomoraic [ə] elsewhere (Shih 2019; cf. Yeh 2017).

(1) *Piuma Paiwan stress* (adapted from Shih 2019a, 2009b; Yeh 2011)
a. Default stress on penult:
[ˈtutaŋ] 'aluminum'
[viˈtsuka] 'stomach'
b. Vowel lengthening in final stressed syllable preceded by a syllable with schwa reduction:
[kəˈriː] 'small'
[qurəˈpuːs] 'cloud'
c. Schwa lengthening in final stressed syllable preceded by a syllable with schwa reduction:
[tsəˈməːl̥] 'grass'
[masəŋˈsəːŋ] 'to make something'

This paper examines directional evaluation (DE; Lamont 2022) in the context of schwa reduction in Piuma Paiwan (Formosan) and argues that, within the framework of *Optimality Theory* (OT; Prince & Smolensky 1993/2004), DE in serial-OT, namely *Directional Harmonic Serialism* (DHS; Lamont, 2022), does not overgenerate typologically unattested patterns of schwa reduction and is therefore superior to DE in parallel-OT (P-OT). The paper is organized as follows: Section 2 gives a brief description of Piuma Paiwan footing; Section 3 presents a DHS analysis of footing and schwa reduction in Piuma Paiwan with revised TROCHEE and IAMB; Section 4 shows how mutated constraint ranking in DE would overgenerate unattested schwa reduction in P-OT but not in DHS; Section 5 discusses theoretical implications and questions for further research.

2 Piuma Paiwan stress: Schwa reduction

Piuma Paiwan is a dialect of Paiwan (Formosan) in which metrical parsing has long been considered sonority-driven in that more sonorous vowels /i, a, u/ are favored over the schwa, the least sonorous, to bear stress in a right-aligned trochee system where stress falls on the penultimate syllable with coda consonants being nonmoraic; except when the penult's nucleus is a schwa in which case the stress shifts to the final syllable (Chen 2009a, 2009b; Yeh 2011). Recent studies, however, provide convincing evidence to show that metrical parsing in Piuma Paiwan is quantity-sensitive rather than sonority-driven

(Yeh 2017; Shih 2019), though these studies differ in how they analyze such quantity-sensitivity. On the one hand, Yeh (2017) claims that, when the penult contains a schwa, inherently non-moraic coda consonants in word-final syllables with a schwa gain weight to satisfy the requirement for an appropriate foot head. Shih (2019), in contrast, argues that such stress shift is a side effect of the schwa's prosodic status. Specifically, he argues that the vowel in a word-final stressed syllable is lengthened, and the schwa in Piuma Paiwan is underlyingly moraic but undergoes, respectively, moraic reduction in the non-head position of a foot, and vowel lengthening as word-final stressed syllable's nucleus. Therefore, the schwa in Piuama Paiwan has three variants on the surface: i) nonmoraic [ᵊ] in the non-head position of a foot, ii) bimoraic [ə:] in the head syllable of a foot, and iii) monomoraic [ə] elsewhere. Since Shih (2019) provides acoustic evidence for the schwa's phonologically conditioned environments as well as for vowel lengthening for foot binarity, while Yeh (2017) does not offer any acoustic measurements to support coda consonants' moraicity in word-final syllables in different phonological contexts, we adopt Shih's argument with the stress pattern in Piuma Paiwan presented below.

(2) *Piuma Paiwan stress* (adapted from Shih 2019; Yeh 2011)

a. Default stress on penult:

[ˈkaka]	'sibling'
[ˈvuvu]	'grandparents'
[ˈgadu]	'mountain'
[ˈtsaviʎ]	'year'
[ˈl̥igim]	'needle'
[ˈtutaŋ]	'aluminum'
[ˈpiku]	'elbow'
[tsaˈʎiŋa]	'ear'
[viˈtsuka]	'stomach'
[ʎaˈvatsaq]	'horesfly'

b. Vowel lengthening in final stressed syllable preceded by a syllable with schwa reduction:

[kᵊˈri:]	'small'
[cᵊˈvu:s]	'sugarcane'
[qapᵊˈdu:]	'gall'
[kᵊˈma:n]	'to eat'
[qurᵊˈpu:s]	'cloud'
[kəmᵊˈla:ŋ]	'to know'

c. Schwa lengthening in final stressed syllable preceded by a syllable with schwa reduction:

[l̥ᵊˈʎə:t]	'lip'
[ʎisᵊˈqə:s]	'nit'
[tsᵊˈmə:l̥]	'grass'
[masᵊŋˈsə:ŋ]	'to make something'

Putting aside the debate on the schwa's moraicity, both Yeh (2017) and Shih (2019) resort, in addition to alignment constraints (McCarthy & Prince 1993), to fine-grained variants of FTBIN (Prince & Smolensky 1993/2004) to capture in P-OT the moraic adjustments in a right-aligned trochee system, whereas no HS analysis has been attempted for metrical parsing in Piuma Paiwan. In the following, we not only demonstrate that DHS can tackle Piuma Paiwan's metrical parsing and schwa reduction without alignment constraints and FTBIN, but also draw a comparison with a directional P-OT analysis to show that HS is more restrictive than P-OT in metrical typology.

3 Piuma Paiwan stress and schwa reduction in DHS

In DHS candidates are evaluated by directionality, i.e., where the violations occur, instead of the number of violated loci (Lamont 2022). Thus, as shown in (3), (σ)σσσ is more optimal than σ(σσ)σ with respect to PARSE(σ)⇒, and σσσ(σ) more optimal than σ(σσ)σ with respect to PARSE(σ)⇐. Crucially, we propose

to revise TROCHEE and IAMB, as in (4) and (5), respectively, for the analysis proper (cf. Lamont 2022).[1] Other crucial constraints required for the analysis are stated in (6) to (9).

(3) *Violation vectors and harmonic ordering*

a. PARSE(σ)⇒:

1111 > 1110 > 1101> 1100 > 1011 > 1001 > 0111 > 0011

σσσσ ≺ σσσ(σ) ≺ σσ(σ)σ ≺ σσ(σσ) ≺ σ(σ)σσ ≺ σ(σσ)σ ≺ (σ)σσσ ≺ (σσ)σσ

b. PARSE(σ)⇐:

1111 > 0111 > 1011 > 0011 > 1101 > 1001 > 1110 > 1100

σσσσ ≺ (σ)σσσ ≺ σ(σ)σσ ≺ (σσ)σσ ≺ σσ(σ)σ ≺ σ(σσ)σ ≺ σσσ(σ) ≺ σσ(σσ)

(4) TROCHEE: Assign one violation for a foot's child that dominates i) a stressed foot-final mora, or ii) an unstressed foot-initial mora.

(5) IAMB: Assign one violation for a foot's child that dominates i) a stressed foot-initial mora, or ii) an unstressed foot-final mora.

(6) *STR/ə (Shih 2019): Assign one violation to a stressed schwa.

(7) *LONG-V (Prince & Smolensky 1993/2004: Assign one violation to a long vowel.

(8) *μ/ə (Shih 2019): Assign one violation for a moraic schwa.

(9) HD(*ft*): Assign one violation for a nonmoraic foot.

Assuming HD(*w*) (Lamont 2022) (with either directionality), which penalizes a prosodic word that does not dominate any feet, is undominated, (10) shows that default stress on penultimate syllables then is a plain result of PARSE(σ)⇐ being ranked below both TROCHEE⇒ and IAMB⇒ on the one hand, and TROCHEE⇒ dominating IAMB⇒ on the other.[2]

(10) *Default stress on penult*

/ʎa$_1$va$_2$tsaq$_3$/	TROCHEE⇒	IAMB⇒	PARSE(σ)⇐
☞ a. ʎa$_1$(ˈva$_2$tsaq$_3$)		$0_1 1_2 1_3$	$0_3 0_2 1_1$
b. ʎa$_1$(va$_2$ˈtsaq$_3$)	$W0_1 1_2 1_3$	L	$0_3 0_2 1_1$
c. (ˈʎa$_1$va$_2$)tsaq$_3$		$W1_1 1_2 0_3$	$W1_3 0_2 0_1$
d. (ʎa$_1$ˈva$_2$)tsaq$_3$	$W1_1 1_2 0_3$	L	$W1_3 0_2 0_1$
☞ e. ʎa$_1$(ˈva$_2$tsaq$_3$)		$0_1 1_2 1_3$	$0_3 0_2 1_1$
f. (ˈʎa$_1$)(ˈva$_2$tsaq$_3$)	$W1_1 0_2 0_3$	$W1_1 1_2 1_3$	L

However, (11) demonstrates how schwa reduction works with regard to metrical parsing. As the schwa generally avoids bearing stress, *STR/ə⇒ must outrank TROCHEE⇒ to account for stress assignment on

[1] Both revised constraints, though penalizing (ˈL$_{\mu}$), permit a heavy syllable to be parsed into its own foot, as a surface (ˈH) may be construed as two distinct representations, (ˈH$_{\mu\mu}$) or (ˈH$_{\mu\mu}$), satisfying respectively (4) and (5).

[2] Except for PARSE(σ) and *STR/ə, the directionalities of the constraints are assumed right-ward as they are irrelevant and have no typological consequences.

the ultimate, i.e., (11d), rather than on the penult, i.e., (11b-c), in the first iteration of the derivation.[3] The derivation proceeds in the second iteration wherein final stressed syllables undergoes vowel lengthening, i.e., (11f), with violated *LONG-V ranked lowest. The vowel lengthening is driven by the higher ranked TROCHEE⇒ and IAMB⇒ as both penalize monomoraic feet. Note particularly that this also shows how TROCHEE⇒ and IAMB⇒ step in for the role FTBIN usually plays in a non-directional analysis. In the third iteration, harmonic improvement is made via schwa reduction induced by sacrificing the lower ranked *μ/ə in favor of the higher ranked *Stressed/ə⇒, TROCHEE⇒, and IAMB⇒. The derivation then converges in the fourth iteration, for no further harmonic improvement is possible because HD(*ft*) outranks PARSE(σ)⇐ and therefore forbids parsing a syllable containing a nonmoraic schwa into its own foot.

(11) *Schwa reduction and final stressed syllable with vowel lengthening*

/ɻə$_1$ʎət$_2$/	*STR/ə⇒	TROCHEE⇒	HD(*ft*)⇒	IAMB⇒	PARSE(*σ*)⇐	*μ/ə⇒	*LONG-V⇒
a. (ɻə$_1$ˈʎət$_2$)	$0_1 1_2$	$W1_1 1_2$		L	L	$1_1 1_2$	
b. (ˈɻə$_1$ʎət$_2$)	$W1_1 0_2$	L		$W1_1 1_2$	L	$1_1 1_2$	
c. (ˈɻə$_1$)ʎət$_2$	$W1_1 0_2$	$W1_1 0_2$		$W1_1 0_2$	$W1_2 0_1$	$1_1 1_2$	
☞ d. ɻə$_1$(ˈʎət$_2$)	$0_1 1_2$	$0_1 1_2$		$0_1 1_2$	$0_2 1_1$	$1_1 1_2$	
e. ɻə$_1$(ˈʎət$_2$)	$0_1 1_2$	$W0_1 1_2$		$W0_1 1_2$	$0_2 1_1$	$1_1 1_2$	L
☞ f. ɻə$_1$(ˈʎəːt$_2$)	$0_1 1_2$				$0_2 1_1$	$1_1 1_2$	$0_1 1_2$
g. ɻ$^{ə}_1$(ˈʎət$_2$)	$0_1 1_2$	$W0_1 1_2$		$W0_1 1_2$	$0_2 1_1$	$L0_1 1_2$	L
h. (ˈɻə$_1$)(ˈʎət$_2$)	$W1_1 1_2$	$W1_1 1_2$		$W1_1 1_2$	L	$1_1 1_2$	L
i. ɻə$_1$(ˈʎəːt$_2$)	$0_1 1_2$				$0_2 1_1$	$W1_1 1_2$	$0_1 1_2$
☞ j. ɻ$^{ə}_1$(ˈʎəːt$_2$)	$0_1 1_2$				$0_2 1_1$	$0_1 1_2$	$0_1 1_2$
k. (ˈɻə$_1$)(ˈʎəːt$_2$)	$W1_1 1_2$	$W1_1 0_2$		$W1_1 0_2$	L	$W1_1 1_2$	$0_1 1_2$
☞ l. ɻ$^{ə}_1$(ˈʎəːt$_2$)	$0_1 1_2$				$0_2 1_1$	$0_1 1_2$	$0_1 1_2$
m. (ɻ$^{ə}_1$)(ˈʎəːt$_2$)	$0_1 1_2$		$W1_1 0_2$		L	$0_1 1_2$	$0_1 1_2$

In sum, the analysis not only shows that the empirical scope of Lamont's (2022) theory of quantity-insensitive footing can extend to quantity-sensitive phonological adjustments but is more parsimonious than previous ones like Yeh (2017) and Shih (2019) in dispensing with alignment constraints and FTBIN, whose effects are subsumed, respectively, under directionally evaluated TROCHEE, IAMB, and PARSE(σ). However, a question arises as to the necessity of carrying out DE of schwa reduction in serialism rather than in parallelism. As (12) and (13) clearly demonstrate, with the same constraint ranking, Piuma Paiwan's stress pattern and schwa reduction in directional P-OT are just as straightforward as in directional HS. In response to this question, I will show in the following section that DE in serialism is theoretically better than in parallelism with respect to typological prediction.

[3] Note that *STR/ə⇒ must also dominate *Stressed/ə⇐ (not shown here) since (11d) wins over (11b-c) because *STR/ə⇒ prefers violations, if any, occur as far from the left edge as possible, whereas *STR/ə⇐ favors the other way around.

(12) *Default stress on penult*

/ʎa$_1$va$_2$tsaq$_3$/	TROCHEE⇒	IAMB⇒	PARSE(σ)⇐
☞ a. ʎa$_1$(ˈva$_2$tsaq$_3$)		$0_1 1_2 1_3$	$0_3 0_2 1_1$
b. ʎa$_1$(va$_2$ˈtsaq$_3$)	$W0_1 1_2 1_3$	L	$0_3 0_2 1_1$
c. (ˈʎa$_1$va$_2$)tsaq$_3$		$W1_1 1_2 0_3$	$W1_3 0_2 0_1$
d. (ˈʎa$_1$)(ˈva$_2$tsaq$_3$)	$W1_1 0_2 0_3$	$W1_1 1_2 1_3$	L
e. (ʎa$_1$ˈva$_2$)tsaq$_3$	$W1_1 1_2 0_3$	L	$W1_3 0_2 0_1$

(13) *Schwa reduction and final stressed syllable with vowel lengthening*

/l̥ə$_1$ʎət$_2$/	*STR/ə⇒	TROCHEE⇒	HD(*ft*)⇒	IAMB⇒	PARSE(σ)⇐	*ə/ɹ⇐	*LONG-V⇐
a. (l̥ə$_1$ˈʎət$_2$)	$0_1 1_2$	$W1_1 1_2$				$W1_1 1_2$	L
b. (ˈl̥ə$_1$ʎət$_2$)	$W1_1 0_2$			$W1_1 1_2$		$W1_1 1_2$	L
c. (ˈl̥ə$_1$)ʎət$_2$	$W1_1 0_2$	$W1_1 0_2$		$W1_1 0_2$	$W1_2 0_1$	$W1_1 1_2$	L
☞ d. (l̥ʾ$_1$ˈʎəːt_2)	$0_1 1_2$					$0_1 1_2$	$0_1 1_2$
e. l̥ə$_1$(ˈʎət$_2$)	$0_1 1_2$	$W0_1 1_2$		$W0_1 1_2$	$W0_2 1_1$	$W1_1 1_2$	L
f. l̥ʾ$_1$(ˈʎət$_2$)	$0_1 1_2$	$W0_1 1_2$		$W0_1 1_2$	$W0_2 1_1$	$0_1 1_2$	L
g. (ˈl̥ə$_1$)(ˈʎət$_2$)	$W1_1 1_2$	$W1_1 1_2$		$W1_1 1_2$		$W1_1 1_2$	L
h. l̥ə$_1$(ˈʎəːt_2)	$0_1 1_2$				$W0_2 1_1$	$W1_1 1_2$	$0_1 1_2$
i. l̥ʾ$_1$(ˈʎəːt_2)	$0_1 1_2$				$W0_2 1_1$	$0_1 1_2$	$0_1 1_2$
j. (ˈl̥ə$_1$)(ˈʎəːt_2)	$W1_1 1_2$	$W1_1 0_2$		$W1_1 0_2$		$W1_1 1_2$	$0_1 1_2$
k. (l̥ʾ$_1$)(ˈʎəːt_2)	$0_1 1_2$		$W1_1 0_2$			$0_1 1_2$	$0_1 1_2$
l. (l̥ʾ$_1$ˈʎət$_2$)	$0_1 1_2$	$W0_1 1_2$		$W0_1 1_2$		$0_1 1_2$	L

4 Serialism vs. parallelism

What makes DE in serialism theoretically more elegant than in P-OT is the fact that, as (14) and (15) show, DE in P-OT would falsely predict unattested languages wherein lookahead effect of word-parity count would determine whether schwa reduction would occur.

(14) *Schwa reduction even-parity words*

/CV$_1$CV$_2$Cə$_3$Cə$_4$/	PARSE(σ)⇐	*STR/ə⇒	TROCHEE⇒	HD(*ft*)⇒	*LONG-V⇒	*μ/ə⇒	IAMB⇒
☞ a. (ˈCV$_1$CV$_2$)(Cˀ$_3$ˈCəː$_4$)		...1$_4$			...1$_4$	...1$_4$	1$_1$1$_2$...
b. (ˈCV$_1$CV$_2$)(Cə$_3$ˈCəː$_4$)		...1$_4$	W...1$_3$0$_4$		...1$_4$	W...1$_3$1$_4$	1$_1$1$_2$...
c. (ˈCV$_1$CV$_2$)(Cˀ$_3$ˈCə$_4$)		...1$_4$	W...0$_3$1$_4$		L	...1$_4$	W1$_1$1$_2$0$_3$1$_4$
d. (ˈCV$_1$CV$_2$)(ˈCə$_3$Cə$_4$)		W..1$_3$0$_4$			L	W...1$_3$1$_4$	W1$_1$1$_2$1$_3$1$_4$
e. (ˈCV$_1$CV$_2$)Cˀ$_3$(ˈCəː$_4$)	W0$_4$1$_3$...	...1$_4$			...1$_4$	...1$_4$	1$_1$1$_2$...
f. (ˈCVː$_1$)(ˈCV$_2$Cˀ$_3$)(ˈCəː$_4$)		...1$_4$	W0$_1$1$_2$...		W1$_1$...1$_4$	...1$_4$	L0$_1$1$_2$...
g. (ˈCV$_1$CV$_2$)(Cˀ$_3$)(ˈCəː$_4$)		...1$_4$		W...1$_3$0$_4$	...1$_4$	...1$_4$	1$_1$1$_2$...
h. (ˈCVː$_1$)(ˈCV$_2$Cə$_3$)(ˈCəː$_4$)		...1$_4$			W1$_1$...1$_4$	W...1$_3$1$_4$	L0$_1$1$_2$1$_3$0$_4$

(15) *No schwa reduction in odd-parity words*

/CV$_1$CV$_2$CV$_3$Cə$_4$Cə$_5$/	PARSE(σ)⇐	*STR/ə⇒	TROCHEE⇒	HD(*ft*)⇒	*LONG-V⇒	*μ/ə⇒	IAMB⇒
a. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)(Cˀ$_4$ˈCə:$_5$)		...1$_5$			W1$_1$...1$_5$	L...1$_5$	L0$_1$1$_2$1$_3$...
b. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)(Cə$_4$ˈCə:$_5$)		...1$_5$	W...1$_4$0$_5$		W1$_1$...1$_5$	...3$_4$1$_5$	L0$_1$1$_2$1$_3$...
c. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)(Cˀ$_4$ˈCə$_5$)		...1$_5$	W...1$_5$		W1$_1$...	L...1$_5$	L0$_1$1$_2$1$_3$0$_4$1$_5$
d. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)(ˈCə$_4$Cə$_5$)		W...1$_4$0$_5$			W1$_1$...	...1$_4$1$_5$	L0$_1$1$_2$1$_3$1$_4$1$_5$
e. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)Cˀ$_4$(ˈCə:$_5$)	W0$_5$1$_4$...	...1$_5$			W1$_1$...1$_5$	L...1$_5$	L0$_1$1$_2$1$_3$...
f. (ˈCV$_1$CV$_2$)(ˈCV$_3$Cˀ$_4$)(ˈCə:$_5$)		...1$_5$	W...1$_3$...		...1$_5$	L...1$_5$	L1$_1$1$_2$1$_3$...
g. (ˈCV:$_1$)(ˈCV$_2$CV$_3$)(Cˀ$_4$)(ˈCə:$_5$)		...1$_5$		W...1$_4$0$_5$	W1$_1$...1$_5$	L...1$_5$	L0$_1$1$_2$1$_3$...
☞ h. (ˈCV$_1$CV$_2$)(ˈCV$_3$Cə$_4$)(ˈCə:$_5$)		...1$_5$			...1$_5$	...1$_4$1$_5$	1$_1$1$_2$1$_3$1$_4$0$_5$

Specifically, a directional P-OT model wherein IAMB⇒ is ranked lower than *LONG-V⇒, while PARSE(σ)⇐ is ranked higher than *STR/ə⇒, would predict an unattested iterative footing language where schwa reduction in the penult appears only in even-parity words (14), but not in odd-parity words (15). Such lookahead effect of word-parity count arises because in (14) the winning candidate (14a) can meet PARSE(σ)⇐ and TROCHEE⇒ at once in even-parity words by sacrificing the lower ranked *LONG-V⇒ and *μ/ə⇒, and consequently, vowel lengthening in word-final syllables and schwa reduction apply simultaneously. Yet as IAMB⇒ is lowest ranked, in odd-parity words in (15), the optimal output (15h) more seriously violates IAMB⇒ in favor of *LONG-V⇒ and *μ/ə⇒, because footing the penultimate

schwa-containing syllable with the preceding syllable does not require additional vowel lengthening for maximal parsing driven by PARSE(σ)⇐ and TROCHEE⇒.

DHS, in contrast, can avoid such a lookahead problem because footing is gradual and harmonically improving. Therefore, as shown in (16), the undominated PARSE(σ)⇐ demands that in the first iteration, the penultimate [Cə] be parsed into the foot regardless of word-parity count, with iambic stress driven by *STR/ə⇒ dominating TROCHEE⇒, i.e., (16a), and that no phonological adjustments apply before exhaustive, maximal parsing. Vowel lengthening (16f, m) and schwa reduction (16k) then apply in favor of TROCHEE⇒ over *LONG-V⇒, and *μ/ə⇒ over IAMB⇒, respectively, only after exhaustive, maximal parsing is achieved in the third iteration.

(16) *Serial parsing with schwa reduction in odd-parity words*

/$CV_1σ_2σ_3Cə_4Cə_5$/	PARSE(σ)⇐	*STR/ə⇒	TROCHEE⇒	*μ/ə⇒
☞ a. $CV_1σ_2σ_3$(Cə₄ˈCə₅)	...$1_3 1_2 1_1$	...1_5	...$1_4 1_5$	...$1_4 1_5$
b. CV_1 $σ_2σ_3$(ˈCə₄Cə₅)	...$1_3 1_2 1_1$	W...$1_4 0_5$	L	...$1_4 1_5$
c. $CV_1σ_2σ_3Cə_4$(ˈCə₅)	W$0_5 1_4 1_3 1_2 1_1$	...1_5	L...1_5	...$1_4 1_5$
d. $CV_1σ_2$(ˈ$σ_3Cə_4$)$Cə_5$	W1_5...$1_2 1_1$	L	L	...$1_4 1_5$
Optimal candidate in 2nd iteration: /$CV_1σ_2σ_3$(Cə₄ˈCə₅)/ → [CV(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)]				
Optimal candidate in 3rd iteration: /CV(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)/ → [(ˈCV_1)(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)]				
/(ˈCV_1)(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)/	TROCHEE⇒	*LONG-V⇒	*μ/ə⇒	IAMB⇒
e. (ˈCV_1)(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)	W1_1...$1_4 1_5$	L	...$1_4 1_5$	$1_1 1_2 1_3$...
☞ f. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)	...$1_4 1_5$	1_1...	...$1_4 1_5$	$0_1 1_2 1_3$...
g. (ˈCV_1)(ˈ$σ_2σ_3$)(Cə₄ˈCə:₅)	W1_1...$1_4 0_5$	L...1_5	...$1_4 1_5$	L
h. (ˈCV_1)(ˈ$σ_2σ_3$)($C^ə_4$ˈCə₅)	W1_1...1_5	L	L...1_5	$1_1 1_2 1_3 0_4 1_5$
i. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)(Cə₄ˈCə₅)	W...$1_4 1_5$	1_1...	W...$1_4 1_5$	L$0_1 1_2 1_3$...
j. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)(Cə₄ˈCə:₅)	W...$1_4 0_5$	W1_1...1_5	W...$1_4 1_5$	L$0_1 1_2 1_3$...
☞ k. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)($C^ə_4$ˈCə₅)	...1_5	1_1...	...1_5	$0_1 1_2 1_3 0_4 1_5$
l. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)($C^ə_4$ˈCə₅)	W...1_5	L1_1...	...1_5	W$0_1 1_2 1_3 0_4 1_5$
☞ m. (ˈ$CV:_1$)(ˈ$σ_2σ_3$)($C^ə_4$ˈCə:₅)		1_1...1_5	...1_5	

(Convergence in 7th iteration not shown)

In short, the DHS evaluation does not consider potentially optimal candidates based on word-parity count as harmonic improvement is locally made in each step of the derivation. Consequently, the locality of schwa reduction is ensured because the undominated PARSE(σ)⇐ guarantees, over a word-final monosyllabic foot, a disyllabic one with the schwa-containing syllable in the non-head position.

5 Conclusion

This paper shows that a DHS analysis works successfully for local schwa reduction in Piuma Paiwan. The current analysis is more elegant than previous P-OT ones in Yeh (2017) and Shih (2019) in not calling up alignment constraints and FTBIN, whose effects are subsumed, respectively, under directionally evaluated TROCHEE/IAMB and PARSE(σ). Moreover, due to its inherent property of gradualness in phonological operations, the DHS model, unlike its P-OT competitor, does not overgenerate unattested schwa reduction in response to word-parity count in an iterative-footing language. A future research agenda may include investigations of a wider spectrum of quantity-sensitive phenomena in both theoretical and crosslinguistic perspectives for a more comprehensive assessment of DHS vs. P-OT.

One possible research topic is how directionally evaluated constraints would fare in *Serial Template Satisfaction* (STS; McCarthy et al. 2012), a theory of reduplication couched in HS. Specifically, Formosan languages like Kavalan, for example, display variable reduplication that imposes a bimoraicity requirement on the reduplicative size to appear as CVC or CVCV (Lin 2012). A similar bimoraicity condition is also reported in Isbukun Bunun (Lin 2018, 2019). While both P-OT (Lin 2012, 2018, 2019) and STS (Lin 2016) analyses have been attempted with FTBIN unsurprisingly playing a significant role in the bimoraicity specification on the reduplicant, Lin's (2016) STS analysis takes both CVC and CVCV variants in Kavalan as a foot template with two different derivational paths as a consequence of constraint interactions: i) for the CVC variant, insertion of one empty syllable followed by copying from the base a string of two moras along with their segmental daughters; or ii) for the CVCV variant, insertion of two empty syllables followed by copying from the base a string of two moras along with their segmental daughters. The divergent derivational paths result from FTBIN being ranked relatively low and therefore violations of foot binarity are permitted in favor of other constraints in intermediate steps of the derivation. A related phenomenon is heavy syllable reduplication in Ilokano (Hayes & Abad 1989) for which two different views are taken on its derivational paths. McCarthy et al. (2012: 197) analyze the pattern as involving a syllable template with certain weight requirement to be formulated. Lin (2016), on the other hand, argues that heavy syllable reduplication Ilokano has the same derivational path as that of the CVC variant in Kavalan, and consequently no weight condition on the template is necessary.

However, as there is no place in DHS for FTBIN w.r.t quantity-sensitivity, a question arises as to whether directionally evaluated TROCHEE and IAMB could replicate as well in STS the effect of FTBIN. How would they affect the length of a string of elements to be copied when interacting with other constraints? Can they account for the fact that considerations of stress and syllable weight in the base may factor into determining the length of the reduplicant like the case in Ponapean (Malayo-Polynesian; Kennedy 2002, 2003; Zukoff 2022)? Would they drive non-local copy that skips intervening elements in the base in favor of better foot types? More radically, if TROCHEE and IAMB could be responsible for surface discrepancies in reduplicative size, do we need the notion of templates in the first place? These are all intriguing because STS is a theory that involves top-down, template-satisfying derivations, while metrical parsing in DHS is considered bottom-up. We leave these questions for future pursuits.

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PERCEPTION OF STRESS IN LIO

Michelle MAYRO
Stony Brook University
michelle.mayro@stonybrook.edu

Grace B. WIVELL
Flores University, Stony Brook University
grace.wivell@stonybrook.edu

Abstract

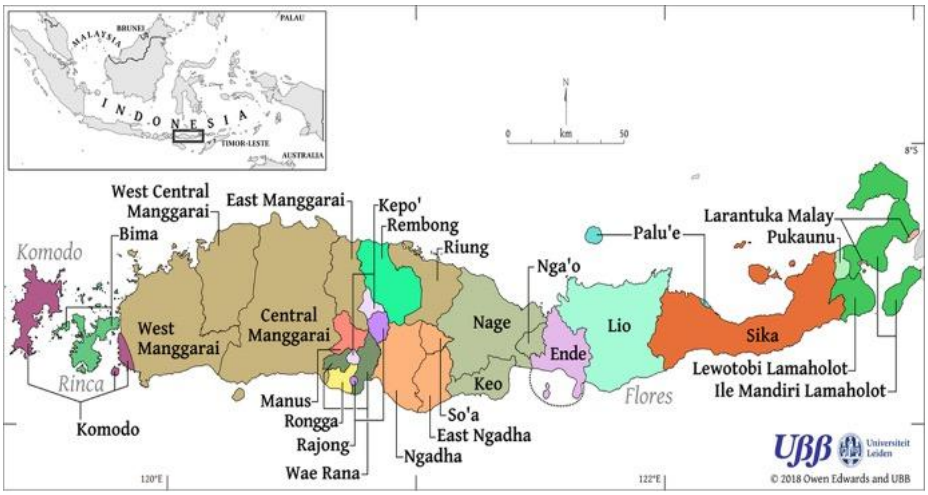
Very little has been published on Lio's stress system, and even less has been supported by acoustic evidence. This paper describes the first experiment to investigate the ability of Lio speakers to perceive stress contrasts. In this pilot study, Lio speakers completed an ABX task that challenged them to match words that differed only in stress location. Preliminary acoustic data from production studies suggest that Lio has fixed penultimate stress. If this is true, we would expect Lio speakers to show an insensitivity to stress contrasts, a phenomenon known as "stress deafness". Results of this experiment confirm that Lio speakers demonstrate a "stress deafness" effect; they accurately identified stress contrasts 50% of the time and were considerably more accurate at identifying native phonemic contrasts. Their performance reinforces the conclusion that Lio is a fixed stress language and provides a model for how to run phonetic experiments with speakers of understudied languages.

Keywords: stress, phonetics, perception, phonology
ISO 639-3 codes: ljl

1 Lio background

Lio is a Malayo-Polynesian language[1] spoken on the island of Flores, Indonesia. It belongs to a dialect chain that encompasses the central part of the island. The Lio-speaking region marks the Eastern boundary of this chain and is colored turquoise in Figure 1.

Figure 1: *Map of the languages of Flores (Edwards and UBB 2018)*



Although Lio has approximately 105,000 speakers (Eberhard et al. 2024), little has been published about the language. There exists a German-Lio dictionary (Arndt 1993), two Indonesian-language

1 The branching of the Malayo-Polynesian language family is contested. Elias (2018) classifies Lio as Central-Malayo-Polynesian, but Glottolog does not recognize Central-Malayo-Polynesian as a valid branch and instead classifies Lio as a Bima-Lembata Malayo-Polynesian language. We have chosen the most conservative description, Malayo-Polynesian, as formal classification is beyond the scope of this study.

theses (Levi 1978 and Mbete 2020), a brief Indonesian-language grammar funded by the Center for Language Development and Cultivation (Pusat Pembinaan dan Pengembangan Bahasa) (Sawardo et.al., 1987) and an English-language thesis describing Lio's phonology and the historical relations of the Central Flores languages (Elias 2018). There are also several proceedings articles on Lio: a study on consonant acquisition (Wivell 2022), an analysis of stop voicing contrast (Miatto and Wivell 2022) and a description of kinship terms (Fluit et al. 2023). All discussions of Lio's stress system are brief and impressionistic. Elias (2018) claims that Lio has fixed initial stress—specifically, stress that falls on the initial syllable of a word unless a schwa occupies that position—but does not support his conclusions with phonetic evidence, only lexical examples.

To verify his claims, Mayro (2024) conducted an acoustic investigation of three naturalistic recordings publicly available on the PARADISEC database (Yanti 2019). The results suggested that Lio exhibits fixed penultimate stress, similar to neighboring Flores languages Ende (McDonnell 2009), Keo (Baird 2002), and Sika (Lewis & Grimes 1995).[2] The majority of CVCV words analyzed demonstrated a penultimate syllable more acoustically prominent than the following final syllable. Of those words that demonstrated this pattern, vowels in penultimate syllables were on average 50% longer and 3 dB more intense than vowels in final syllables. However, they did not exhibit increased f0, a common typological correlate of word stress (Gordon and Roettger 2017). Stress was not found to be contrastive, and no minimal stress pairs could be identified. When schwa appeared in the penultimate syllable, stress location became unpredictable, in accordance with Elias's observations about schwa.

Although the production data confirms a tendency to make penultimate syllables more prominent, the question remains: are Lio speakers sensitive to this prominence? In other words, is stress equally salient in perception as it is in production?

2 Fixed stress languages and "stress deafness"

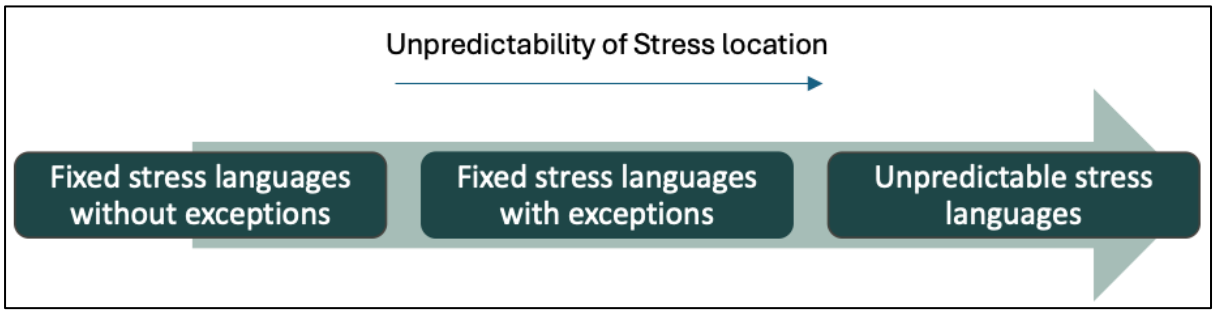
Studies in stress perception have revealed an interesting asymmetry in the production and perception of stress: although speakers of fixed stress languages may consistently produce the acoustic markers of stress in their speech, they have a difficult time perceiving stress contrasts. This phenomenon has been dubbed "stress deafness" (Dupoux et al. 1997, Dupoux et al. 2001).

"Stress deafness" is not an inability to perceive stress. Speakers who are "stress deaf" do not have hearing or processing impairments; what they have is an insensitivity to stress contrasts that arises because they lack a phonological representation of stress. The phenomenon is analogous to the difficulty native Japanese speakers have in discriminating /l/ and /ɹ/ (see Goto 1971 and Miyawaki et al. 1975). Because the two approximants are not native to Japanese's phonemic inventory, speakers do not store distinct phonological representations for /l/ and /ɹ/. Instead, they map both approximants to a single native category: /ɾ/. As a result, Japanese speakers have difficulty discriminating /l/ and /ɹ/. Likewise, because speakers of fixed stress languages don't store phonological representations of stress, speakers have difficulty discriminating words that differ only on the basis of stress location.

Peperkamp et al. (2010) have demonstrated that "stress deafness" exists on a spectrum. The degree of "stress deafness" a speaker experiences is correlated with the predictability of stress location in the speaker's native language. The more predictable stress location is, the more insensitive the speaker is to stress contrasts. This correlation is represented in Figure 2.

2 Stress claims are more complicated for Ende and Sika than for Keo; specifically, the penultimate syllable of a lexical root is stressed in Ende and Sika, while the penultimate syllable of a word is stressed in Keo.

Figure 2: *Spectrum of "stress deafness". Sensitivity to stress contrasts increases as you move rightward along the spectrum*



No stress languages (i.e., Standard French) and fixed stress languages without lexical exceptions (i.e., Finnish) have maximally predictable stress patterns. As a result, speakers of these languages are the most insensitive to stress contrasts. Speakers of languages with unpredictable stress assignment (i.e., Spanish) are the most sensitive to stress contrasts, and speakers of fixed stress languages with lexical exceptions (i.e., Polish) fall somewhere in between.

If Lio has fixed penultimate stress, as suggested by the acoustic study described above, then we would expect Lio speakers to demonstrate some degree of "stress deafness". Although the appearance of schwa in penultimate syllables makes stress location unpredictable in those words, schwa's variable ability to bear stress is not a strict lexical exception. This phenomenon is unaccounted for in the typology proposed by Peperkamp et al. (2010), so it's unclear how it would affect stress discrimination, if at all. Nevertheless, we would expect Lio speakers to be less adept at stress discrimination than speakers of unpredictable stress languages. Following Dupoux et al. (1997), we designed an ABX discrimination task to determine the precise degree of stress deafness.

ABX tasks consist of three consecutive stimuli: A, B and X. A and B differ by a single contrast, and X matches either A or B for this contrast. In the case of the present experiment, this contrast is stress location. Based on the acoustic properties of Lio observed in Mayro (2024), the results of monolingual French speakers performing a similar ABX task in Dupoux et al. (1997), and the results of French-Spanish bilinguals in Peperkamp et al. (1999), we made the following hypotheses: 1) Lio speakers would test at or slightly above chance at accurately matching stress location, 2) Lio speakers would demonstrate higher accuracy matching stimuli that differed by a segmental contrast native to Lio than a stress contrast, which is nonnative to Lio, and 3) participants bilingual in a language with unpredictable stress (i.e., English) may demonstrate higher accuracy at stress matching that non-bilinguals, but this effect would be negligible, given that stress is encoded only by duration and intensity in this experiment, not f0, one of the most salient cross-linguistic exponents of stress.

3 Method

3.1 Materials

The stimuli for this experiment were synthesized from four naturalistic Lio recordings available on PARADISEC (Yanti 2019). Three disyllabic words of the form CVCV were used. One of these words, [bebo], was a real Lio word; the other two, [ᵐbasa] and [ŋasa], were nonwords formed by isolating individual syllables of real words and splicing them in Praat (Boersma & Weenink 2023). For example, the syllables of real words [ᵐbana] and [mesa] were isolated and then spliced to create the nonword stimulus [ᵐbasa], thereby creating a word that is phonologically possible in Lio but absent from the lexicon.

For each word, two stimuli were created using PSOLA resynthesis, one with stress on the penultimate syllable and one with stress on the final syllable. This resulted in a minimal pair of the form [ᵐbása] ~ [ᵐbasá]. Stressed syllables were made prominent in accordance with the values demonstrated in the production study; stressed vowels were made 50% longer and 3 dB greater in intensity than unstressed vowels. Since f0 was not found to correlate with stress in the production study, we flattened

the f0 contour in the experimental stimuli to ensure neither syllable was lent prominence by f0 movement.

This ultimately left us with 18 words: 3 words x 2 stress locations x 3 distinct speakers. These words were then organized into "stress triplets". Each triplet consisted of three variations of the same word, each spoken by a different speaker. Word 1 and Word 2 differed in stress location, and Word 3 matched the stress location of either Word 1 or Word 2. This resulted in triplets like [ᵐbása] ~ [ᵐbasá] ~ [ᵐbása] and [bebó] ~ [bébo] ~ [bébo]. In every triplet, Word 1 and Word 2 were spoken by male speakers and Word 3 was spoken by a female speaker.

Filler stimuli were created alongside the stress triplets. Two words were used for the filler stimuli: [ŋasa] and [ᵐbasa]. Like the stress triplets, the filler stimuli each consisted of three variations of the same word, each spoken by a different speaker. Also like the stress triplets, Word 1 and Word 2 of the filler stimuli differed by a single contrast, and Word 3 matched either Word 1 or Word 2 for this contrast. Unlike the stress triplets, the contrast of the filler stimuli was segmental, not stress-based. For example, [ŋ] and [ᵐb] represent a native phonemic contrast in Lio, so the triplet [ŋása] ~ [ᵐbása] ~ [ᵐbása] was created. In this sense, the filler stimuli could be considered "segmental triplets". To ensure the filler stimuli only exhibited a single contrast, Word 1, Word 2 and Word 3 of the filler stimuli were all given penultimate stress. All words across both types of triplets measured exactly 375 ms, and a 400 ms pause separated each word in a triplet.

3.2 Participants

Four Lio speakers (1M, 3F) between the ages of 26 to 39 participated in this experiment. All were born in Lio-speaking subdistricts and identified as ethnically Lio. All four speakers reported Lio as their first language and native fluency in Indonesian. Three speakers reported knowledge of additional languages: English (3) and Mandarin (1). All participants reported receiving an undergraduate degree, and one received a master's degree.

3.3 Procedure

The experiment was administered via Qualtrics. Since Lio lacks a standardized written form, the instructions were written in Indonesian. Given that the majority of Lio speakers are bilingual in Indonesian, this did not exclude any potential participants.

Participants began the experiment by completing a language background survey. Following completion of the survey, participants began a training period. During this period, participants were presented with five practice trials. The practice trials were identical to the experimental trials, save for the fact that the stimuli were different, and participants were given feedback on their responses after each question. They were then given the opportunity to correct their answer before moving to the next practice trial.

The experiment began following the last practice trial. Each experimental trial followed the same procedure. Participants were played an experimental triplet—either a stress triplet or a filler item—and asked to identify whether Word 3 was the same as Word 1 or Word 2. They could play the experimental triplet up to two times, but following the second play, the link to the audio file disappeared. Number of plays was restricted because "stress deafness" is an insensitivity to stress contrasts, not an inability to perceive stress contrasts. With unlimited plays, stress insensitive participants should still be able to accurately perceive contrasts. For this reason, Dupoux et al. (1997) allowed participants to play audio files only once in their ABX task. Because participants of the present study were located in areas where internet connectivity could be a barrier to smooth website function, we chose to cap plays at two times to allow for possible technical difficulties.

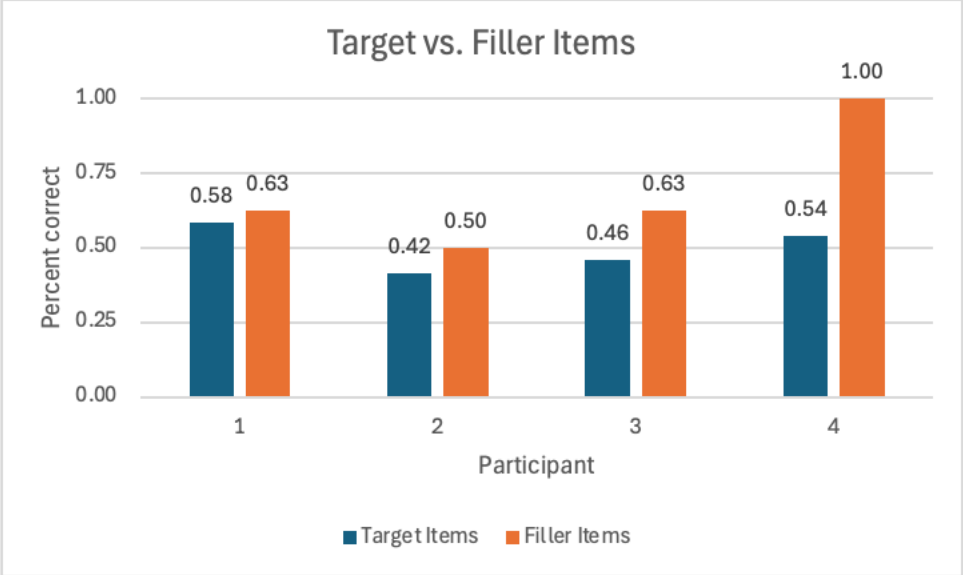
After playing each experimental triplet, participants were required to select either "Word 1" or "Word 2" in order to proceed to the next trial. During the training period, if the participant selected the correct answer, "CORRECT" appeared on the screen, and "INCORRECT" appeared when incorrect answers were selected. This feedback did not appear during the experimental trials.

There were 32 total experimental trials, presented in randomized order. 24 of these trials used stress triplets; 8 used the segmental triplet filler stimuli.

4 Results

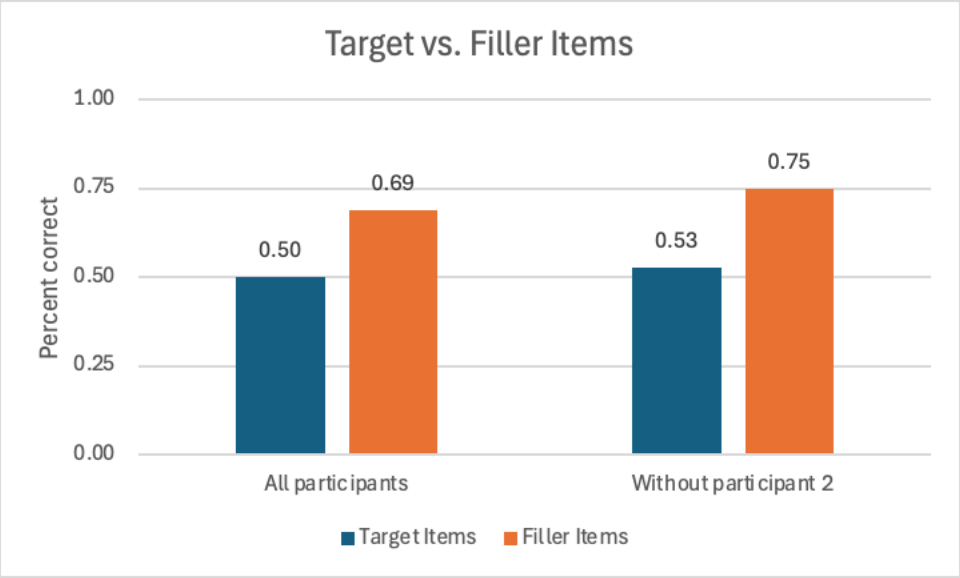
The average accuracy rate across all participants on the stress triplets was 50%. In other words, participants were able to accurately match Word 3 to either Word 1 or Word 2 of the stress triplets 50% of the time. Participants performed better on the filler items, the segmental triplets. On average, participants were able to accurately match Word 3 to either Word 1 or Word 2 of the filler items 69% of the time. This information is represented in Figure 3.

Figure 3: *Accuracy on contrast identification by participant. For each participant, the left bar represents percentage correct on target items (the stress triplets). The bar on the right represents the percentage correct on filler items (the segmental triplets).*



Participant 2 performed worse on both the stress triplets and filler items than the other three participants. When excluded, accuracy rates increase appreciably to 53% on the stress triplets and 75% on the filler items. This information is represented in Figure 4.

***Figure 4**: Accuracy on contrast identification across participants. The two bars on the left represent average performance for all four participants. The two bars on the right represent average performance for all participants when Participant 2 is excluded.*



There was a negligible difference in accuracy for matching stress in real words vs. nonwords. Participants were able to identify stress contrasts for the real word [bebo] 50% of the time vs. 54% of the time for nonwords [ᵐbasa] and [ŋasa]. There was a more noticeable difference between accuracy rates for the Lio-English bilinguals (Participants 1, 2 and 4) vs. the monolingual Lio speaker (Participant 3). The mean accuracy rate for the bilinguals was 51% on the stress triplets and 71% on the filler items, while the accuracy rate for the monolingual participant was 46% on the stress triplets and 63% on the filler items.

Participants were able to play experimental triplets a maximum of two times. On average, they played the stress triplets more than the filler items: 1.33 times and 1.28 times, respectively.

5 Discussion and conclusion

We made three predictions for this experiment: 1) Lio speakers would test at or slightly above chance at accurately matching stress location, 2) Lio speakers would demonstrate higher accuracy on the filler items than the stress triplets, and 3) participants bilingual in a language with unpredictable stress (i.e., English) may demonstrate higher accuracy at stress matching than non-bilinguals, but this effect would be negligible, given that stress is encoded only by duration and intensity in this experiment, not f0. All three hypotheses were ultimately borne out.

First, participants were able to accurately match stress on the stress triplets exactly 50% of the time. This number increased negligibly to 53% when Participant 2 was excluded. The reasoning behind excluding Participant 2 lay in their performance on the filler items. It was expected that participants would perform very well on filler items, given that they represented a native phonemic contrast in Lio. Filler items were therefore included to serve as a way of determining engagement; poor performance on filler items would suggest that participants were less engaged, perhaps clicking through the questions without paying much attention. Counting number of audio plays also served this purpose. If participants moved to the next trial without playing the audio, we would know that they were not engaged in the experiment and could remove their results from consideration.

While Participant 2 performed worse than expected on the filler items (50% accuracy), they did play each filler item at least 1 time, suggesting that engagement might not have been the problem. We have included accuracy rates with and without Participant 2 because of Participant 2's unexpectedly low accuracy score for filler items, but ultimately accuracy on the target items—the stress triplets—was comparable with and without Participant 2: 50% vs. 53%.

Second, participants demonstrated higher accuracy on the filler items than the stress triplets, as expected. Participants accurately matched stress in the stress triplets 50% of the time and matched the segmental contrast in the filler items 69% of the time. Performance on the filler items jumped to 75% when Participant 2 was excluded. With or without Participant 2, performance on the filler items was substantially better than the stress triplets.

Third, the bilingual Lio-English participants (Participants 1, 2 and 4) performed better on both the stress triplet trials and the filler item trials than their monolingual Lio counterpart (Participant 3). The bilingual participants demonstrated a mean accuracy rate of 51% on the stress triplets, compared to 46% for the monolingual participant, and 71% on the filler items, compared to 63% for the monolingual participant. While it is true that the bilingual participants demonstrated higher accuracy overall, it should be noted that there was only 1 monolingual speaker for comparison. It therefore seems imprudent to draw firm conclusions from these data.

What can be concluded from these data is that the accuracy rates of Lio speakers is consistent with the accuracy rates demonstrated by speakers of languages with predictable stress (i.e. French and Finnish). In other words, the Lio speakers exhibited "stress deafness", an insensitivity to stress contrasts, as we would expect for speakers of a fixed stress language. This result supports the findings of the production study run by Mayro (2024), for if Lio did not have fixed stress, we would expect a smaller "stress deafness" effect in participants, which would translate to higher accuracy on the stress triplet ABX task.

In the future, we plan to expand this pilot study to include a larger number of participants. Doing so will allow us to draw more confident conclusions. As it stands, this study constitutes one of the first perception studies conducted with speakers of an understudied Southeast Asian language, an important step toward both a better understanding of Lio and a more thorough typological understanding of stress in world languages.

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FIRST MILLENNIUM CE MAINLAND SOUTHEAST ASIAN REGIONAL LOANWORDS RELATED TO MATERIAL CULTURE

Mark ALVES
Montgomery College
mark.alves@montgomerycollege.edu

Abstract
This study reviews loanwords related to material culture that are in multiple language families in Mainland Southeast Asia, with a focus on words whose earliest supporting evidence falls in the 1st millennium CE, though the timing of the borrowings has extended into the 2nd millennium. An etymological review of such words adds to the picture of 1st millennium Mainland Southeast Asia historical language contact and provides chronological points of reference to further develop hypotheses. The lexical categories in this study consist of metals and metal implements, ceramics and pottery, transportation, and miscellaneous trade items. Factors considered include historical phonology, textual and epigraphic data, geographic linguistic data, archaeological data, and historical information. The primary donor languages are Indic (Sanskrit and Pali), Sinitic (Old and Middle Chinese), and Austroasiatic languages of state-level societies (especially Old Khmer). Among the recipient languages are both national languages and minority languages in Austroasiatic, Malayo-Chamic, Daic, and Tibeto-Burman. The 27 widespread wordforms in this study represent significant regional sociocultural contact and change in this formative period.

Keywords: language contact, Southeast Asia, loanwords, etymology

1 Introduction[1]

Mainland Southeast Asia (MSEA hereafter) is known for intensive, long-term, complex language contact resulting in widespread loanwords and typological convergence, with particular intensity starting in the 1st millennium CE. The 1st millennium in MSEA was an era of profound cultural influence from India and China, the rise of state-level polities, and major sociocultural contact. As a result, massive sociocultural, sociopolitical, and technological developments occurred in the region in this period, though ethnohistorical details are limited. Loanwords provide concrete evidence of sociocultural contact, and the nature of those loanwords or categories of loanwords can imply specific types of interaction and influence. Moreover, by focusing on the 1st millennium CE, the objects associated with the words can be given chronological context. Consequently, exploration of widespread loanwords from this period can be informative to both historical linguistics and the study of human history broadly.

This article reviews 27 wordforms that are found in multiple language families in MSEA and can be shown to have had a presence in the region from at least the beginning of the Common Era. While the words were not necessarily initially widespread in the region, over centuries, they reached multiple language groups, thereby demonstrating regional language contact. The main goals of this study include the following.

- Identifying MSEA words of material culture in multiple language families, with the earliest evidence dating to the 1st millennium CE based on historical linguistic and ethnohistorical data
- Establishing chronological points of reference for sets of words in semantic domains to aid in historical phonological and etymological research in MSEA

[1] I must thank Roger Blench for reading and giving helpful comments in this article.

- Finding patterns of loanwords in semantic/cultural domains in this period to contribute to understanding of language contact ethnolinguistic history in MSEA
- Applying and refining an inter-disciplinary approach in etymological research

In the next sections, the data and methods are first described, and then the 27 wordforms are presented and discussed with supporting historical linguistics and ethnohistorical information. The conclusion presents implications of the data and research approach.

2 Data sources, methods of analysis, and ethnohistorical linguistic context

This section presents the sources of lexical data for this study, the ways that the lexical data was gathered and how relatedness and chronology were determined, and an ethnohistorical linguistic context to support the analyses and claims.

2.1 Use of data sources

The data used for this study consists of a range of lexical databases, proto-language reconstructions, digital dictionaries, and relevant ethnohistorical and archaeological studies. A list of the utilized resources is provided in the Appendix. The languages come from all major language groups in the region: Austroasiatic, Austronesian (primarily the Malayo-Chamic branch), Kra-Dai (primarily the Daic branch), Hmong-Mien, Sino-Tibetan/Trans-Himalayan (Tibeto-Burman and Sinitic languages), and Indic languages (primarily Sanskrit and Pali). In the various digital resources, I searched for senses and semantic sense clusters, for example, meanings in the category of headwear: hat, cap, helmet, and the like. In digital language dictionaries for individual languages, all entries with key words are found, and in the digital databases, hundreds of languages as well as reconstructions are part of the search results. I then assembled worksheet files with the data and visually scanned the data for comparable wordforms and organized probable lexical groupings into tables. Below are notes on key resources.

- Old Chinese (OC hereafter) and Middle Chinese (MC hereafter) reconstructions are those of Baxter and Sagart (2015).
- The Proto-Tai reconstructions are as a default those of Pittayaporn (2009), but sometimes from Li (1977) as indicated.
- The Austroasiatic data, including both modern languages and reconstructions, comes from various sources contained in the online database, the *Mon-Khmer Etymological Dictionary*.
- The Sanskrit data is from Apte (1957-1959), while the Pali data comes from the Pali Text Society (1921-1925). Several words in this study, including 'cotton', 'cart', 'casting net', and 'plough', are among those noted by Hoogervorst (2021) on the influence of languages of Southeast Asia, though his focus is mostly on loans in national languages.
- Proto-Chamic reconstructions are those of Thurgood (1999).
- For modern languages of MSEA (i.e., Burmese, Cambodian, Lao, Malay, Shan, Thai, Vietnamese, etc.), the digital dictionaries of SEALANG were checked.
- Regarding textual data, digital resources were checked for early Chinese and Old Khmer, Old Mon, and Old Javanese epigraphs. The Old Khmer dictionary in particular often provides particular years or ranges of years of inscriptions, which constitutes very concrete chronological points of reference. (Note: While Javanese is not in MSEA or part of Malayo-Chamic, it dates as far back as the 800s, and Javanese was part of the greater regional contact and exchange. Thus, it is periodically referred to as an additional point of reference.)

I have periodically referred to sources that have posited etymological origins of some of these words, but my research was necessarily not exhaustive. Claims of etymological origins have often been made in passing in articles, making it difficult to locate them. Regardless, all previous related etymological claims made without the benefit of extensive digital databases and searching tools must be re-evaluated, and I hope that in such instances, this current study provides clarification for them.

2.2 Determining relatedness of wordforms

To determine whether wordforms are related and not simply instances of chance similarity, as expected, I sought consistency of both phonological segments in wordforms and of their semantics. Differences were tolerated when they were slight and/or explainable (e.g., knowing when codas were lost in stages of Chinese and the effect of that on the posited loanwords; knowing that words for 'knife' and 'sword' changed in languages over time; etc.). In addition, these are supported by anywhere from several to dozens of languages, making the patterns even more evident than were I to consider just two languages. With attestations of wordforms in large numbers of languages, the overlapping phonological and semantic features become clarified and/or reinforced (e.g., despite the variety of meanings of loanwords for pottery, they wordforms maintained comparable phonological shapes in many languages, etc.). When wordforms have generally consistent phonological forms and senses and are in multiple languages in multiple language families, the likelihood of chance similarity is significantly reduced, but not completely. Wordforms with significant aberrations in form or meaning are readily excluded, but also, exclusions become more evident when patterns are otherwise robustly supported in other languages.

Admittedly, while I have background in historical phonology in the region and familiarity with many of the languages and language families in the data, I do not have expertise in the historical phonology of all of them. There is always the possibility of making incorrect claims, but hopefully, the large number of patterns of words in languages makes this less likely, and the overall claims should remain intact even if some details turn out to be incorrect.

2.3. Determining chronology

To determine the earliest instance of words in MSEA, I applied the following criteria. It is important to note that the earliest occurrence is only a starting point of a word's history, and diffusion of a word in the region may have taken centuries.

● Phonological features of Vietnamese: Vietnamese tones, onsets, and vowels can be used to identify strata of Chinese loanwords (see Alves 2018:269-275 and 2024 for details). Broadly speaking, Late MC is from the 2nd millennium CE, while OC and Early MC are from the 1st millennium. Most features of those early Chinese loanwords predating Late MC can be connected to the 1st millennium CE but without precise periodization (e.g., diphthongized vowels, retained stop labial onsets from Early MC or Late OC versus Late MC lenited labial onsets, etc.), while a few features (e.g., lenited onsets in words in which OC originally had presyllabic material, retention of OC *r, hỏi/ngã tones stemming to OC final fricatives, etc.) can be hypothesized to date to the beginning of the 1st millennium.

● Textual attestations: Old Khmer inscriptions have been dated, sometimes with general periods and sometimes with precise years. Only those dating to the 1st millennium are considered in this study. Old Mon and Old Javanese inscriptions are not so precisely dated in available records, but Old Mon in particular mostly belongs to the 1st millennium. Early Chinese texts are sometimes considered to make certain that certain words have sufficient historical depth.

● Early stages of languages: Reconstructions of Old Chinese and Middle Chinese are essential. Crucially, only words dating to the Early Middle Chinese period can be considered for this study as Late Middle Chinese is generally considered to be associated with the early 2nd millennium. Sanskrit and Pali words offer no precise dates, but many were borrowed initially in the 1st millennium. Also, we can consider Vietic as it has a number of Chinese but also Indic loanwords among its reconstructions. An important criterion is Tai loanwords: As Daic is generally thought to have spread into MSEA towards the end of the 1st millennium, we can assume that most Daic loanwords spread into the region in the 2nd millennium, so Tai loanwords generally belong to that later period and are mostly not among the words in this study. However, details of the timing of Tai loans in MSEA still need to be worked out.

● Ethnohistorical information: Information about major political expansions and the emergence of state-level societies provides context for language contact situations. These include Han Dynasty expansion into northern Vietnam, the emergence of Khmer kingdoms, historical data about the contact with groups from India, and others. Again, considering that the Daic expansion happened c. 1000 CE, and the first

Tai kingdoms date to the 13th century, Tai loanwords entered MSEA languages mostly in the 2nd millennium CE.

2.4 Ethnohistorical context

The ethnohistorical linguistic and language contact context in the 1st millennium CE is summarized in Table 1. Overall, the various 1st millennium state-level polities of early Khmer, Mon, Vietic, Malay, and Cham ethnolinguistic groups experienced varying degrees of language contact with each other and with early Indic and Sinitic language groups.

Table 1: *Key language groups in the study and ethnohistorical linguistic notes*

Language groups	**Ethnohistorical linguistic features**
Austroasiatic	Dispersal into MSEA starting before 2000 BCE Khmer- and Mon-speaking polities from the early 1st millennium CE
Daic	Tai dispersal from southern China into MSEA by c. 1000 CE Tai-speaking kingdoms from the early 2nd millennium CE
Malayo-Chamic	Possibly connected to Sa Huynh culture (c. 500 BCE to 200 CE) (Nguyen 2007:311) in central Vietnam Chamic-speaking polities in Vietnam and Malay-speaking polities on the Malay peninsula from the early centuries of the Common Era
Tibeto-Burman	Tibeto-Burman Pyu city-states from the early 1st millennium and the Bagan kingdom at the end of the 1st millennium
Minority groups	Peoples from all language groups settled in various areas, many in highland areas
Sinitic	Administrative control in northern Vietnam from c. 100 BCE by speakers of Old Chinese in the Han Dynasty (c. 200 BCE to 200 CE) Early Middle Chinese presence in northern Vietnam in centuries after the Han Dynasty, and emissaries elsewhere in MSEA Maritime presence of Chinese-speaking traders and emissaries throughout MSEA, unclear how much settlement occurred until textual evidence in the Song Dynasty (960 to 1279 CE)
Indic	Indic language contact with the Mon, Khmer, Chamic, and Malay polities from the beginning of the Common Era

3 Semantic Domains and presentation of the data

The 27 wordforms in this study fall into four major categories: metals and metal implements, ceramics and pottery, transportation, and various trade items. 27 is a modest number, but these words in semantic clusters represent significant cultural and technological exchange and influence.

The lexical items are presented as follows. First, in the opening section for a semantic domain, a table lists the wordforms and proposed etymological sources. To represent the wordforms occurring in multiple languages, an informal meta-form in all-caps (e.g., PRAK ‘silver’) is provided as a proxy for a general phonological shape found among the languages. Then, a source reconstruction or other historically attested form (e.g., an ancient textual reading) is presented. Individual subsections provide key supporting, contextualizing discussion and ethnohistorical, archaeological, etymological, and historical linguistic notes. Finally, select modern language forms are provided as clarifying supporting evidence. The main language groups in the discussion are Austroasiatic, Daic, and Malayic, and then Sinitic, Indic, while other groups are discussed according to the data.

Not all available lexical data is presented as that would require too much space for concise presentation. Also, when attested words are presented in the discussion, these are not repeated in the boxes with comparative data. But in general, the supporting evidence should be sufficient at this point to demonstrate relatedness of the attested words in the various language groups.

3.1 Metals and metal implements

The words in this category refer to three metals and three metal implements, as in Table 2. (Note that in the table and throughout this article, the wordforms in all caps are used as approximate representations of the words of multiple language families and are not intended to be precise reconstructions; reconstructions are for individual language groups/families only.) The spread of the words likely accompanied the spread of the technological practices, though we cannot posit the ethnohistorical origins of the practices based on linguistic evidence alone as they could have come from multiple ethnolinguistic groups and not necessarily only the specific ones in this study. Thus, whether the words represent the earliest point of sociocultural spread of these practices will need additional information from ethnoarchaeological study. A brief ethnohistorical summary of this domain follows.

The Bronze Age in MSEA is widely considered to have started by the mid- to late-2nd millennium BCE, while the Iron Age in MSEA began in the mid-1st millennium BCE and continued into the Common Era (Stark 2015). As for precious metals, gold and silver likely began to be used in the second half of the 1st millennium BCE (Bennett 2009; Schlosser et al. 2012). Whether metallurgical practices in MSEA originally spread from India or China (or even elsewhere) is not clear. Regardless, the proposed early sources of the words, including Sanskrit, Old Chinese, and Proto-Tai suggests possible lines of inquiry to offer hypotheses.

Table 2: *Regional wordforms for metals and metal implements and viable donor languages*

Wordforms	**Proposed etymological sources**
a. ‘silver’ PRAK	Sinitic (白 *bái* ‘white’ (‘silver’ in a lexical compound), OC *bˁrak)
b. ‘gold’ MAS	Indic (Sanskrit *māṣaḥ* ‘a particular weight of gold’, but alternatively, an innovation in Malayo-Chamic or Old Mon
c. ‘iron’ TEK	Sinitic (鐵 *tiě* ‘iron’, OC *l̥ˁik, MC *thet*)
d. ‘ploughshare’ LƉGAL	Indic (Sanskrit *laṅgalam* ‘ploughshare’)
e. ‘knife, machete’ BRA	Daic (Proto-Tai *ɟm̥.ra:C ‘machete, big knife’)
f. ‘sword’ TAW	Sinitic (刀 *dāo* ‘knife’, OC *C.tˁaw, MC *taw*)

To clarify the chronology of loanwords, we can consider other widespread wordforms for metals that likely diffused in the region in the 2nd millennium after the Daic expansion. These include KAM ‘gold’ (from OC 金 *jīn* ‘metal’ *k(r)[ə]m via Daic *ɣam^{A} ‘gold’ (Li 1977)), ƉAN ‘silver’ (from OC 銀 *yín* ‘silver’ *ŋrə[n] via Daic *ŋən^{A} (Li 1977)), and HLEK ‘iron’ (from OC 鐵 *tiě* ‘iron’ *l̥ˁik via Daic ʰlek^{D} ‘iron’ (Pittayaporn 2009)). Also, a (C)MUL ‘silver’ form appears in Proto-Palaungic (*kmuul ‘silver’) and Proto-Khmuic (*kmuːl ‘silver’) and in Proto-Tibeto-Burman *mul ‘silver’ (Matisoff 2003) (cf. Tibetan *ṣmul* ‘silver’). However, currently, there is insufficient evidence to determine the timing or even the direction of borrowing.

a. ‘Silver’ PRAK

The PRAK ‘silver’ form has been claimed to be an Austroasiatic loanword into Chamic (Thurgood 1999:359), though no historical or archaeological evidence supports this. A source with archaeohistorical support is Old Chinese *brak ‘white’. In the Han Dynasty, both Chinese 白 *bái* ‘white’ and 黃 *huáng* ‘yellow’ were used as modifiers before *jīn* 金 ‘metal’ to derive the meaning ‘silver’ and ‘gold’ respectively. Both words are early Chinese loanwords in Vietnamese with the retained senses: Vietnamese *vàng* (versus Sino-Vietnamese *hoàng*) means both ‘yellow’ and ‘gold’ (a word that did not spread widely in MSEA), though *bạc* means only ‘silver’ (see Alves 2018:265-266 for discussion)). Gold (see the next section b on MAS ‘gold’) and silver items at the Prohear archaeological site have been dated from the 2nd century BCE to the 1st century CE (Schlosser et al. 2012), concurrent with the Han Dynasty (c. 200 BCE to 200 CE). Chinese texts note that by the 200s CE, silver was commonly used for trade (Cœdès 1968:42). Pre-Angkorian Old Khmer inscriptions from c. 578-677 CE contain the word *prak* ‘silver’ (modern Khmer *prak*). This word is seen throughout Malayo-Polynesian languages in the South China Sea region and Austroasiatic branches in MSEA. It is possible that Malayo-Chamic was a primary means of this spread, but such a claim would require additional ethnohistorical evidence. This word did not enter Daic, which instead has a different Chinese loan, as

noted in the previous subsection in 3.1. (a situation that arguably corresponds to later entry of Tai-speaking groups into MSEA). Regardless of whether silver metallurgy practices were originally spread by Sinitic speakers, this PRAK form appears to have become widely used in both MSEA and the South China Sea.

Comparative Data for 'Silver' PRAQ
- Sinitic – OC *bˁrak 'white'
- Austroasiatic – Aslian (e.g., Semai *pɛɹaʔ* 'silver'), Bahnaric (Proto-West-Bahnaric *prak 'silver'), Katuic (Proto-Katuic *praʔ, *prak 'silver'), Khmeric, Monic (e.g., Nyah Kur *prak* 'silver'), Pearic (e.g., Chong *prak* 'silver'), Vietic (e.g., Vietnamese *bạc* 'silver')
- Malayo-Chamic – Malay *perak* 'silver', Proto-Chamic *pirak 'silver' (also widespread comparable forms in Malayo-Polynesian)

b. 'gold' MAS

As noted in a. on PRAK 'silver', gold excavated in MSEA has been dated to before the Common Era, and early Chinese texts note the trading of gold for fabrics in MSEA. Old Khmer *māṣ* 'gold' dates to the pre-Angkorian period in inscriptions dated from 578 to 677 CE. Sanskrit *māṣa* 'a bean; a part. weight of gold' is noted by Zoetmulder and Robson (1982) as a probable source of Old Javanese *mās, mas, ĕmas, hĕmas* 'gold'. The Sanskrit word is a viable etymological source, though there are both semantic and phonetic issues, including an epenthesized presyllable (cf. Old Mon *yimās* 'shining (gold)') and a generalized meaning from a specific one (i.e., a unit of measure of gold to gold in general), but considering the broader Indic influence in cultural and linguistic domains, the claim is reasonable. However, if this is an instance of chance similarity, then the word could have been innovated in Malayo-Chamic languages or Old Mon in light of their presyllables, even while the trading of gold may have been spread through contact with India.

Comparative Data for 'Gold' MAS
- Indic – Sanskrit *māṣaḥ* 'a particular weight of gold'
- Malayic – Malay *emas* 'gold', Proto-Chamic *ʔa.ma(:)s 'gold'
- Austroasiatic – Aslian (e.g., Temiar *mas* 'gold'), Bahnaric (e.g., Tampuan *maah* 'gold'), Khmeric, Mon, Pearic (e.g., Chong *maːʔs* 'gold'), Nicobaric (e.g., Nicobarese *maːs* 'brass')

c. 'Iron' TEK

The Dong Son culture (c. 700 BCE to 100 CE) of northern Vietnam lasted from the Bronze into the Iron Age, often considered in archaeological literature to have started in the mid-1st millennium BCE. Vietic *klac 'iron' (Ferlus's 2007 reconstruction, but not a viable Proto-Vietic word as Proto-Vietic likely predates the Iron Age) is a possible loanword from OC *l̥ˁik 'iron' (see Alves 2018:265-266), which would be one of the earliest Chinese loans in MSEA. The situation is complicated as the OC reconstruction has a final *k, MC *thet* 'iron' has a final *t, while the current Vietic reconstruction has instead *c, an intermediary position in the vocal tract. All three finals occur among the Vietic languages (e.g., Vietnamese *sắt* 'iron', Ruc *kʰlat* 'iron', Pong *kʰlɛc* 'iron', Phong *kʰlɛk*). While one possibility is chance similarity, another viable possibility is that this a very early loan before widespread Vietic-Sinitic bilingualism, hence some slight phonological irregularity.

Regardless of the history of this wordform in Vietic, the earliest widespread form is TEK. Old Khmer *tek* 'iron' (modern Khmer *daek* 'iron') is found in Pre-Angkorian Khmer inscriptions dating from 578 to 677 CE. Comparable wordforms are in other Austroasiatic languages. The TEK form is distinct from Proto-Tai *hlek form, which appears to be an early OC form. In contrast, the TEK form could be from the end stage of OC or early MC: it has /t/ onset likely from MC *th, but the /k/ coda of OC. In contrast, the Daic loan with the *hl onset was likely borrowed earlier in southern China, in the stage of OC *l̥, and it only spread into MSEA in the 2nd millennium CE (e.g., Khmuic (Mlabri *hlek* 'iron'), Palaungic (Palaung *hlaik* 'iron')).

Comparative Data for 'Iron' TEK
- Sinitic – Chinese 'iron', OC *l̥ˤik, MC *thet*
- Austroasiatic – Bahnaric (e.g., Stieng *tɛɛk* 'iron'), Katuic (e.g., Bru *tak* 'iron'), Khmeric (e.g., Surin Khmer *dɛːʔ* 'iron'), Mangic (e.g., Mang *taːk⁷* 'iron'), Pearic (e.g., Chong *dɛːk* 'iron'), Vietic
- Daic – Proto-Tai *ʰlekᴰ (spread after the Daic expansion)

d. 'Plough, ploughshare' LƉGAL

Many bronze ploughshares have been excavated at the Co Loa site in northern Vietnam and dated to the 3rd century BCE (Nam et al. 2010), while an iron ploughshare has been found at the Iron Age Noen U-loke site in Thailand (Higham 2022). Considering the spread of iron metallurgy practices from the north, one possibility is the spread of this word from the north into Vietic territory. However, Proto-Vietic *gal 'ploughshare' shows an Indic origin, though the timing and path of transmission is uncertain (e.g., from Indic to Vietic directly or hypothetically via another Austroasiatic group, such as Khmeric). Old Khmer inscriptions have *ʔaŋ ˈgal* 'plow' as early as 713 CE, but that is much later than the Co Loa evidence. This wordform has spread into many languages to the northeast near and inside India (e.g., Khasic, Tibeto-Burman languages). Overall, this is a widespread Indic word of technological significance, but details of the word's history and its spread remain to be determined.

Comparative Data for 'Plough, ploughshare' LƉGAL
- Indic – Sanskrit *laṅgalam* 'ploughshare'
- Austroasiatic – Aslian (e.g., Sakai *tĕnggāla* 'ploughshare'), Bahnaric (e.g., Sre *ŋal* 'plough'), Katuic (e.g., Kui *ŋkhàl* 'plough'), Khasic (e.g., Pnar *lŋkɔr* 'plough'), Khmeric, Vietic
- Malayo-Chamic – Malay *tĕnggala* 'plough', Cham *laŋăl* 'plough' (also cf. Old Javanese)
- Tibeto-Burman – (various languages in multiple branches)

e. 'Knife, machete' BRA

The BRA form referring to a large knife is widespread in both Daic and Kam-Sui branches of Kra-Dai, suggesting a possible Kra-Dai innovation and not an Austroasiatic innovation which spread into Kra-Dai. The loan *rựa* 'bush-knife' in Vietnamese (Proto-Vietic *m.raːʔ 'bush-knife') has a tone category suggesting pre-tonogenesis borrowing, and if so, the borrowing dates at least to the early 1st millennium CE, if not the BCE period (see discussion on this word in Alves 2015). However, while it is widespread in Austroasiatic, only the Vietic branch has very early evidence of lexical exchange with Daic along the northeast part of MSEA. Still, some other Austroasiatic languages have retained a final glottal stop (i.e., Palaungic and Monic), meaning borrowing centuries before the Daic expansion. We can speculate that this word spread via Daic to the northwest of MSEA or that Vietic was the donor language via some past trade route, but neither scenario can be confirmed or refuted. Finally, this word may have spread into other some Austroasiatic languages after the Daic expansion considering they lack the final glottal stop (e.g., Bahnaric, Katuic, and Khmuic).

Comparative Data for 'Knife, machete' BRA
- Austroasiatic – Bahnaric (Proto-Bahnaric *bra: 'machete, bush-knife'), Katuic (Proto-Katuic *braa 'knife (large)'), Khmuic (Proto-Khmuic *bra: 'machete'), Mangic (e.g., Mang *pjaːˀ* 'knife'), Monic (Proto-Monic **mraaʔ* 'machete'), Palaungic (? *plaʔ 'tool, knife (classifier))'), Vietic
- Daic – Tai (Proto-Tai *ɟm̥.ra:C 'machete, big knife'), Kam-Sui (*mbra⁴ 'knife, sword')
- Tibeto-Burman – Burmish (e.g., Achang *mʐau³¹* 'knife'), Loloish (e.g., Nusu *mɹɯ⁵⁵* 'knife')

f. 'Sword, knife' TAW

Swords have been unearthed in Han-style brick tombs in northern Vietnam (Phan 1988), which corresponds to the time of the end stage of OC. Vietnamese *dao* 'knife' has a lenited onset /z/, in contrast with the later Sino-Vietnamese stop onset /ɗ/ (Sino-Vietnamese *đao* from Chinese 刀 *dāo* 'knife'). This

indicates that it was borrowed when OC still had presyllabic material (OC *C.tˤaw) (see Alves 2024 for explanation of OC loans and lenited onsets among early Chinese loanwords in Vietnamese). However, in most of the languages in the data, the word has a /t/ or /d/ onset, suggesting later borrowing from the MC period (MC *taw* 'knife'), or potentially even later loans from Chinese dialects. It is not seen in available records of Old Khmer epigraphs, so though the Vietnamese loan suggests an early introduction into the region, the subsequent timing of the spread of this word cannot be determined without further historical phonological exploration among various languages.

Comparative Data for 'Sword, knife' TAW

- Sinitic – 刀 *dāo* 'knife', OC *C.tˤaw, MC *taw*
- Austroasiatic – Bahnaric (e.g., Proto-West-Bahnaric *ta:w 'sword'), Katuic (e.g., Bru *daaw* 'sword'), Khmeric (e.g., Khmer *daaw* 'sword'), Khmuic (Khsing-Mul *zaw nep* 'dagger'), Pearic (Samre *da:w* 'saber'), Vietic (e.g., Tho *ðəaːw* 'knife')
- Daic – Lao (*ta:o*^{1} 'sword, long knife'), (also widespread in Daic in southern China)
- Malayo-Chamic – Proto-Chamic *ɗaw 'sword' (noted by Thurgood (1999:278) as a likely Chinese loanword)

3.2 Ceramics and pottery

The number of items in this category is larger than the others, with nine wordforms in Table 3. In addition, many more regional loanwords for pottery date to the 2nd millennium CE. While pottery practices date back at least several thousand years in the region in the archaeological record (Lim 2019), that was strictly earthenware pottery. Contact with Indic and Chinese cultures affected architectural and religious practices, but crucially, Chinese-speakers brought the innovated practices of glazed pottery, first in Vietnam, but later in other parts of MSEA. In addition, there is a history of regional exchange in pottery and pottery practices. These archaeological matters have some matching lexical correlates.

Note: In this semantic domain in particular, the meanings of words for pottery can vary among languages as the semantic parameters of perceived status are on a continuum (e.g., from plate to dish to bowl to cup) and varied in functions (e.g., for daily storage, cooking, burial items, etc.), in addition to being viewed as specific versus generalized terms (e.g., a pot versus pottery in general). Nevertheless, enough instances of consistency in semantics and phonological forms among the languages support claims of relatedness of the words gathered in the data.

Table 3: *Regional wordforms for ceramics and pottery and viable donor languages*

Wordforms	**Proposed etymological sources**
a. 'brick' IT	Indic (Pali *itthakā* 'brick')
b. 'tile' ŊOJ	Sinitic (瓦 *wǎn*, OC 'tile', *C.ŋʷˤraj?, MC ngwaeX)
c. 'ceramic dish' CHAN/CHEN	Sinitic (盞 *zhǎn* 'a small cup or container', OC *tsrar?, MC tsreanX)
d. 'cup, pot, bowl, basin' AƆ	Sinitic (盎 *àng* 'cup, pot, bowl', OC *ʔˤaŋ-s, MC 'angH)
e. 'cup, ladle' CHOK	Sinitic (勺 *sháo* 'spoon, ladle', MC dzyak 'ladle (n.)'); Alternatively, Old Khmer *cɔːk* 'small, shallow cup'
f. 'drinking bowl' KHAL	Austroasiatic (no reconstruction)
g. 'jar' CHEH	Austroasiatic (*ceʔ, *ceh 'kind of jar' (Shorto 2006))
h. 'alms bowl' BAT	Indic (Sanskrit *supātra* 'alms bowl')
i. 'bowl' PIƆAN	Classical Persian (*pingān* 'bowl'), via Dravidian?

a. 'brick' IT

There are numerous Indic-influenced brick monuments in Khmer-kingdom areas from the mid-1st millennium (e.g., Stark, Sanderson, & Bingham 2006). Correspondingly, the posited source of the widespread IT 'brick' is Pali *itthakā* 'brick' (Jenner 2009:606) (Sanskrit *iṣṭakā* 'brick' seems a less likely source considering the *ṣṭ* cluster with *ṣ*). In Old Khmer inscriptions, the earliest attestation of *it*

'brick' is in the pre-Angkorian period in texts from 578 to 677 CE. The word also spread to Austroasiatic languages in India. This word is found in only a few hilltribe languages, as expected for groups that live in traditional homes of bamboo or wood. Borrowing of IT into Tai languages in MSEA may have occurred in the 2nd millennium CE (and crucially, in MSEA Tai languages rather than in southern China, further indicating borrowing after contact with Khmer after the Daic expansion). Overall, evidence shows that this word's history in MSEA begins in the mid-1st millennium, and it spread widely in the region.

Comparative Data for 'Brick' IT
- Indic – Pali *itthakā* 'brick'
- Austroasiatic – Khasic (Proto-Khasic *ʔit 'brick'), Khmeric, Munda (Juang *iʈa* 'brick'), Nicobaric (Car *ʔit* 'brick'), Palaungic (Palaung *ut* 'brick'), Pearic (e.g., Pear *ʔet* 'brick')
- Daic – Lao (*ít tʰá* 'brick'), Thai (*ìt* 'brick'), Shan (*ʔut*^{2} 'brick'), etc.

b. 'tile' ŊOJ

Roof tiles are another ceramic product with early archaeological evidence in MSEA. Thousands of tiles dating to the 3rd to 2nd century BCE have been excavated at the Co Loa site outside of Hanoi (Kim et al. 2010). Though they cannot be specifically proven to be from China (e.g., none have Chinese writing on them), such items are not found earlier in the region, and they have a Chinese-like style (Ibid.). Vietnamese has a loanword *ngói* 'roof tile' from OC *C.ŋ^{wˤ}rajʔ 'roof tile'. It is ancient as marked by the [-j] off-glide, matching the OC form *C.ŋ^{wˤ}rajʔ, though whether the word was borrowed before the Common Era or in the early 1st millennium CE cannot be determined. The MC form (and potentially from more recent Chinese dialects) without the off-glide has been borrowed widely in Daic and Hmong-Mien. However, other than Vietnamese, only a handful of Tai lects in or near Vietnam (and potentially loanwords from Vietnamese) have the [-j] coda to connect that form to the early 1st millennium.

Comparative Data for 'roof tile' ŊOJ
- Sinitic – 瓦 *wǎ* 'roof tile', OC *C.ŋ^{wˤ}rajʔ, MC ngwaeX
- Austroasiatic – Vietnamese
- Daic – Black Tai *ŋɔy*^{6} 'tile', Southern Dong *ŋai*^{31} 'tile', Tai Hongjin *ŋɔi*^{3} 'tile', Yongbei Zhuang *koːi*^{5} 'tile'

c. 'ceramic dish' CHAN/CHEN

Early instances of Chinese glazed pottery are noted in northern Vietnam from the Han Dynasty (e.g., Southeast Asian Ceramic Society (2022)). Glazed stoneware in Cambodia has been dated to the later part of the 1st millennium (Wong 2014). A corresponding widespread word in MSEA referring to a ceramic dish has variously a CHAN or CHEN form. It is likely from Chinese 盞 *zhǎn* 'a small cup or container' (OC *tsrarʔ, MC tsreanX), as posited by Pou and Jenner (1973:42). Vietnamese *chén* 'cup, small bowl' (versus later literary Sino-Vietnamese *trản*) has not only a tone marking it as a 1st millennium word, but also the /ɛ/ vowel, a common feature in early Chinese loanwords in Vietnamese. Old Khmer *ca:n* 'bowl, cup' (modern Khmer *ca:n*) appears in inscriptions as early as 655 CE. However, while both Vietnamese and Khmer borrowed these in the 1st millennium, the timing of their spread into minority languages is as yet unclear. Regarding the posited borrowing in Daic, there is a problem: the tone A does not match the tone C category of Chinese (or Vietnamese). This weakens the claim of word relatedness, or at least suggests a later timing of borrowing.

Comparative Data for 'ceramic dish' CHAN/CHEN
- Sinitic – 盞 *zhǎn* 'a small cup or container', OC *tsrarʔ, MC tsreanX
- Austroasiatic – Bahnaric (e.g., Laven *ca:n* 'dish, bowl, plate'), Katuic (e.g., Bru *ca:n* 'plate'), Khmeric, Khmuic (e.g., Khsing-Mul *ceːn* 'cup for drinking'), Mangic (e.g., Mang *cɛːn*^{6} 'bowl'), Monic (e.g., Nyah Kur *cáan* 'plate'), Pearic (e.g., Chong *ʨaːm ʨaːn* 'plate'), Vietic
- Daic – Proto-Tai *čan^{A} 'plate, cup' (also in many Kra-Dai languages in southern China)
- Malayo-Chamic – Rhade *chien* 'bowl/cup'

d. 'cup, pot, bowl, basin' AŊ

The expansive semantic range of this word includes nearly any bowl-like pottery. In Vietnamese, the spoken reading *ang* 'crock, earthen saucer, basin' with a level tone (versus literary Sino-Vietnamese *áng* with a tone matching the MC category (see Alves 2018 for explanation)) marks it as a pre-tonogenesis stage in Vietnamese, thus placing it in the 1st millennium. However, as the OC and MC reconstructions have similar rhymes, the timing of the spread of this word is harder to determine outside of Vietnamese. It appears in Old Khmer inscriptions as *ʔaːŋ* 'basin, vat, tub, tank' (modern Khmer *ʔoŋ* 'kind of large bowl') in the early 2nd millennium (1119 CE).

Comparative Data for 'cup, pot, bowl, basin' AŊ
- Sinitic – 盎 (甕) *àng* 'cup, pot, bowl', OC *ʔˤaŋ-s, MC 'angH
- Austroasiatic – Khmuic (e.g., Khsing-Mul *ʔaːŋ* 'basin, bowl'), Khmeric, Monic (e.g., Mon *ɛŋ* 'bowl'), Vietic
- Daic – Proto-Tai *ʔaŋB (Li 1977) (also in languages of Kam, Kra, and Hlai)
- Tibeto-Burman – Written Burmese *aŋ* 'earthen cup or bowl'

e. 'cup, ladle' CHOK

The CHOK form has been posited to be a Chinese loanword by Pou and Jenner (1973:46), namely, Chinese 勺 *sháo* 'ladle' (cf. the Cantonese pronunciation *coek*^{3}, and comparable forms in numerous southern Chinese varieties). Appearing in Austroasiatic, Daic, and Malayo-Chamic, the widespread sense of CHOK in MSEA is 'cup', a reasonable semantic shift from 'ladle', and the graph of the character itself is derived from an image of a cup (Karlgren 1991:253). The stop onset of OC *tewk shows this must have been borrowed in a later period, at least from the MC stage (MC dzyak). Old Khmer *cɔːk* 'small, shallow cup' (modern Khmer *caak* 'a small, shallow cup') occurs in inscriptions near the end of the 1st millennium CE (878-977 CE), which is at the time of the spread of Chinese-style stoneware. However, the semantic shift somewhat increases the likelihood of chance similarity. If it is chance similarity, we can speculate that Old Khmer, which has the earliest linguistic evidence, is a potential source. In either case, a possible scenario is borrowing from Old Khmer to Daic.

Comparative Data for 'cup, ladle' CHOK
- Sinitic – 勺 *sháo, zhuó* 'spoon, ladle; unit of volume', OC *tewk, MC dzyak
- Austroasiatic – Bahnaric (e.g., Bahnar *kəcɔɔk* 'cup, glass'), Katuic (e.g., Bru, Kui *cɒːk* 'glass, cup'), Khmeric (e.g., Surin Khmer *ʨaːʔ* 'a cup'), Khmuic (e.g., T'in [Mal] cɔ́ːk 'cup, glass'), Vietic (e.g., Thavung *cọːk*^{32} 'cup')
- Daic – Thai *jɔ̀ɔk* "a small cup or glass, Lao *cɔ̀ːk* 'goblet; cup/bowl', and in a dozen other MSEA Tai lects
- Malayo-Chamic – Malay *chuek* 'small cup', Rhade *kcoʔk* 'cup, drinking glass'

f. 'Drinking bowl' KHAL

The KHAL wordform is in both Austroasiatic and Daic. The Old Khmer *khal* 'small cup for ritual food-offerings' (not found in modern Khmer dictionaries) appears in inscriptions back to 947 CE, and in Old Mon, *khɔl/khal* 'cup, bowl' to the 11th century CE. Some of the definitions among the languages (e.g., Old Khmer, Proto-Monic, Thavung) suggest an early ritual usage of this item. It has spread into Daic as shown by the final /n/, a common replacement for final /l/, and that form has apparently spread

into a few Austroasiatic languages as seen by their /n/ codas. The phonologically comparable Sanskrit *khallaḥ* 'A stone or vessel for grinding drugs' has semantics that are not the same but not entirely dissimilar, so this word is worth considering as an etymological source, but only if additional ethnohistorical information can be provided for this object. Until such information is available, we consider the scenario in which Old Khmer is the source, and it spread to Daic and to other Austroasiatic languages, in some cases via Tai languages.

Comparative Data for 'Drinking bowl' KHAL
- Indic – Sanskrit *khallaḥ* 'A stone or vessel for grinding drugs'
- Austroasiatic – Bahnaric (e.g., Stieng & Tampuan *khal* 'bowl (drinking)'), Katuic (e.g., Kui *khal* 'bowl (drinking), dipper'), Khmeric, Monic (Proto-Monic *khal 'small cup for offerings'), Vietic (e.g., Thavung *khân* 'a bowl in which offerings in spirits are placed')
- Daic – Thai *kʰăn* 'bowl, basin', Lao Lao *kʰăn* 'cup/bowl', and five other MSEA Tai lects

g. 'jar' CHEH

The CHEH form means 'jar' in all attested instances in Austroasiatic languages and Cham. The Old Khmer form *cɛh* 'jar' (not found in modern Khmer dictionaries) is seen in inscriptions back to 972 CE. The [h] coda is dominant among the languages, but evidence of a final glottal stop variant is in both Proto-Katuic and the tone category of Vietnamese *ché* 'jar', which also allows for a pre-tonogenesis timing of the 1st millennium. It is a likely innovation in Austroasiatic, but which language is the source cannot be determined.

Comparative Data for 'Jar' CHEH
- Austroasiatic – Bahnaric (e.g., several lgs. *cɛh* 'jar'), Katuic (Proto-Katuic *cɛh, *cɛɛʔ 'jar'), Khmeric, Monic (Proto-Monic *cɛh 'small jar'), Vietic
- Malayo-Chamic – Cham *čaiḥ* 'jar, pot'

h. 'Alms bowl' BAT

Buddhism had a presence in parts of MSEA from at least the early part of the 1st millennium CE. An example of this contact is the spread of the BAT 'alms bowl' word, with an Indic origin. Old Khmer *supātra* 'fine quality cup' (modern Khmer *baat* 'Buddhist Monk's alms bowl'), dating to 681 CE. Vietnamese *bát* 'bowl' (with a generalized modern meaning) is regarded a Sino-Vietnamese reading from Chinese 鉢, 钵 *bō* 'earthenware basin', cf. Cantonese *but*^{3} 'alms bowl'. This also puts it at the beginning of the 2nd millennium, though it not impossible for this to have spread earlier with the same basic sound, especially as northern Vietnam was known for being a hub of Buddhism from the early 1st millennium. The timing of the spread of this wordform into Daic may require ethnohistorical information as the historical phonological details alone are not informative.

Comparative Data for 'Alms bowl' BAT
- Indic – Sanskrit *supātra* 'beautiful cup or receptacle', Pali *patta*
- Austroasiatic – Katuic (e.g., Bru *baːt* 'alms bowl'), Khmeric, Monic (e.g., Nyah Kur *báat* 'alms bowl'), Pearic (e.g., Pear *baːt* 'alms bowl'), Vietic (e.g., Muong *pat*^{3} 'bowl'),
- Daic – Proto-Tai *pat 'bowl' (Li 1977), in Thai, Lao, and various MSEA Tai lects
- Malayo-Chamic – NA (but cf. Old Javanese *pātra* 'drinking vessel')

i. 'Bowl' PIŊAN

The PINGAN wordform meaning 'bowl' has been considered to of Persian origin (Classical Persian *pingān* 'cup, bowl'). It is widespread in both Austroasiatic and Western Malayo-Polynesian, suggesting both land and maritime trade. However, it is not clear whether it was borrowed originally through direct language contact with Persian or via another language, such as Tamil (as posited by Blust 2017). Old Javanese (800s to 1200s) has this form, so its earliest spread may span the end of the 1st to the beginning of the 2nd millennium. More ethnohistorical information is needed to determine this word's history.

Comparative Data for 'Bowl' PIŊAN

- Persian via Dravidian – Classical Persian *pingān* 'cup, bowl' > Dravidian (e.g., Tamil *pī'nkān* 'porcelain, chinaware, a plate')
- Austroasiatic – Aslian (e.g., Semai *pɪŋat* 'plate, platter'), Bahnaric (Proto-South-Bahnaric *təgaːn ~ *ʔngaːn ~ *pəŋaːn 'bowl'), Katuic (e.g., Pacoh *ti.ŋaːn* 'bowl'), Monic (e.g., Middle Mon *pəŋgan* 'earthenware, earthenware bowl'), Nicobaric (e.g. Car *pi-ŋãːl* 'a plate')
- Malayo-Chamic – Malay *pinggan,* Proto-Chamic *piŋan 'bowl; dish' (Malay, Proto-Chamic) (also in Old Javanese *piṅgan* and various languages in Western and Central Malayo-Polynesian)

3.3 Transportation

There are only four wordforms in this category, shown in Table 4. While boats and paddles have an unquestionable deep history in the region, the timing of the spread of carts and especially horses in MSEA is more difficult to assess. Still, chariots and horses appear in bas-relief carvings on walls among Angkorian temples, and Angkor had a system of roads connecting parts of the kingdom (Hendrickson 2011). But whether the origins of the spread of the horse and cart correspond to the origins of the words themselves cannot be determined with certainty.

Table 4: *Regional wordforms for transportation and viable donor languages*

Wordforms	**Proposed etymological sources**
a. 'horse' (A)SHE	Indic (Or AA?) (Sanskrit *aśvaḥ*, Pali *assa*)
b. 'cart' RTEH	Indic (Sanskrit *rathyaḥ*)
d. 'boat, canoe' DUK	AA (Old Khmer *dūk*?)
c. 'oar' CHEEU	Sinitic via Vietic? (櫂 MC draewH)

Other widespread wordforms that likely date to the 2nd millennium include (a) MA 'horse' (from Chinese 馬 *mǎ* 'horse', OC *mˁraʔ, MC maeX, Proto-Tai ma^{A} 'horse' (Li 1977)), (b) EK 'yoke' (from Chinese 軛 *è* 'yoke', OC *qˁ<r>[i]k, MC eak; Proto-Tai *ʔɛkD 'yoke' (Li 1977)), and (c) AN 'saddle' (from Chinese 鞍 *ān* 'yoke', OC *ʔˁan, MC 'an; Proto-Tai ʔan 'saddle' (Li 1977)). These are all originally Sinitic forms, but they probably spread via Daic or Vietnamese (all belong to the Sino-Vietnamese layer). The regional MRAŊ 'horse' wordform is probably a Tibeto-Burman etymon (Proto-Tibeto-Burman *k-m-raŋ ⩙ s-raŋ 'horse' (Matisoff 2003)) that spread into Austroasiatic languages, but the timing of its spread has not yet been checked based on historical phonological traits of the recipient languages.

a. 'horse' (A)SEH

The (A)SEH 'horse' wordform is found throughout MSEA Austroasiatic and in the Karenic branch of Tibeto-Burman. It cannot be a loanword from Karenic as its languages have different tones, suggesting borrowing into Karenic (https://stedt.berkeley.edu/~stedt-cgi/rootcanal.pl/etymon/7353). One potential etymological source is Sanskrit *aśvaḥ* 'horse' (while Pali *assa* 'horse' lacks the final [h] coda). While the phonological features are not perfect, it is reasonable to hypothesize that it is a spoken loan from Indic. Further support is the viability of the borrowing of 'cart' in entry b. Old Khmer inscriptions from 956 CE have the form *'aseḥ* (modern Khmer *seh* 'horse', while Old Khmer *'aśvaṇī* 'horse' appears to be a literary borrowing of the Sanskrit reading aśvinī (Jenner 2009:582)), and Old Mon has *kseh* 'horse'. It is not in Daic, which has a Chinese source MA as noted above, nor in Malayo-Chamic (but note that Old Javanese has a Sanskrit source *aśwa* 'horse'). Another possibility is that this is an instance of chance partial similarity and that it is actually a lexical innovation in, for example, Old Mon, considering the specific *k onset in contrast with glottal stop in other languages. However, for now, I consider the stronger option to be Indic considering the significant sociocultural impact of Indian culture in various domains, in addition to the borrowing of the Indic word for 'chariot', as discussed in the next subsection b.

Comparative data for 'horse' (A)SEH
- Indic – Sanskrit *aśvaḥ* 'horse'
- Austroasiatic – Bahnaric (Proto-Bahnaric *ʔəsɛh 'horse'), Katuic (*ʔasɛh 'horse'), Khmeric, Monic (e.g., Proto-Monic *ksɛh 'horse', Nyah Kur *chéh* 'horse'), Proto-Palaungic (Proto-Palaungic *sɛh 'horse'), Pearic (e.g., Chong *sɛːh* 'horse')
- Tibeto-Burman – Karenic (e.g., Sgaw (northern) *kə³³se¹¹* 'horse')

b. 'cart' RTEH

The RTEH 'cart' wordform is extremely widespread, appearing in four language families in the data. It has a clear Sanskrit origin (not Pali *ratha* 'cart', which lacks a final [h]). I cannot find clear timing of the introduction of the Indian-style chariot. However, bas-relief carvings of war chariots are found in Angkorian temples, and Old Khmer inscriptions contain *radeḥ* 'vehicle' as early as the 600s (674 CE).

Comparative Data for 'cart' RTEH
- Indic – (Sanskrit *rathyaḥ* 'a part of a chariot', *rathaḥ* 'a charioteer')
- Austroasiatic – Bahnaric (e.g., Bahnar & Stieng *rədɛh* 'cart'), Katuic (e.g., Kui *rthèh* 'wagon'), Khmeric (e.g., Surin Khmer *rteh* 'a cart, wagon'), Monic (e.g., Nyah Kur *kəthéh* 'cart'), Pearic (e.g., Pear *rətɛːh* 'cart')
- Daic – Thai *râthêʔ* 'cart'
- Malayo-Chamic – Cham *ladĕh* 'cart', Rhade *edêh* (also cf. Old Javanese *ratha* 'cart', similar to the Pali form)
- Tibeto-Burman – Meithei *rətʰə* 'chariot'

c. 'boat, canoe' DUK

The distribution of the DUK wordform puts Khmer at the geographic center (also see Diffloth 2011 for a summary). Old Khmer *dūk* 'boat' occurs in inscriptions from 578 to 677 CE in the pre-Angkorian period. The [n] onset of Vietnamese *nốc* 'boat, canoe' (considered a central dialect word) indicates early borrowing post-dating the merge of implosive *ɗ with [n]. It appears to have been borrowed into Thai, but not Malayo-Chamic (Note: Malay *bidok* 'boat' is a probable instance of chance partial similarity.). While it is not possible to confirm or refute an Old Khmer origin, it is unlikely to have spread from a minority language, making Old Khmer a reasonable if not likely candidate.

Comparative Data for 'boat, canoe' DUK
- Austroasiatic – Bahnaric (Proto-Bahnarick *duːk 'boat'). Katuic (e.g., Proto-Katuic *duuk 'boat'), Khmeric (e.g., Surin Khmer *tuːʔ* 'boat'), Monic (e.g., Nyah Kur *thùuk* 'boat'), Pearic (e.g., Pear *tôk* 'boat'), Vietic (Proto-Vietic *ɗoːk 'boat'),
- Daic – Thai *tùuk* 'boat, ship'

d. 'oar' CHEEU

CHEEU 'oar' is seen in multiple language families in the region. The posited Sinitic source is an archaic Chinese word in texts from the Warring States period of the mid-1st millennium BCE. It is used as both a noun 'oar' and verb 'to paddle' in Chinese, but the noun sense is dominant among the recipient languages, though with some instances of the verb sense. It is difficult to clarify the specific type of oar of the original sense, but the Malay definition 'long oar worked standing' suggests a possible innovation that could have spread. However, ethnohistorical queries would be needed to clarify the sense and possible path of diffusion of the item. The linguistic evidence makes this an early 1st millennium loan. This includes both the vowel /ɛ/ and level tone in Vietnamese *chèo* 'oar' (versus Sino-Vietnamese *trạo*, with /a/ and a non-level tone) and the Old Khmer form early-/pre-Angkorian inscriptions *cɛːw* 'oar' (modern Khmer *caːɛw*) sometime between 578 and 777 CE.

Comparative Data for 'oar' CHEEU
- Sinitic – Chinese 櫂 *zhào* 'oar (archaic)', MC draewH
- Austroasiatic – Bahnaric (e.g., *cɛɛw* 'oar'), Katuic (e.g., Kui *cɛɛw* 'oar'), Khmeric (e.g., Surin Khmer *ʨɛɛːw* 'to paddle'), Pearic (e.g., Chong *ceːw* 'oar'), Vietic
- Daic – Thai *ˈjɛɛw* 'oar', Lao *cèːu* 'oar'
- Malayo-Chamic – Malay *chiau* 'long oar worked standing'

3.4 Miscellaneous trade items

Unlike words referring to metals and ceramics, the words in this category are of materials that disintegrate due to the Southeast Asian climate and soil. The supporting ethnohistorical and archaeological data herein consists primarily of early texts, images on bronzes and stone bas-reliefs, archaeobotanical studies, and general ethnohistorical information.

Table 5: *Regional wordforms for miscellaneous trade items and viable donor languages*

Wordforms	**Proposed etymological sources**
a. 'cotton' KPAS	Indic – Pali *kappāsa* 'cotton'
b. '(fishing) net' JAL	Indic – Sanskrit *jālam* 'net'
c. 'flute' PI	Kra-Dai – pSW Tai *pii^{B} 'a wind instrument'
d. 'sesamum' LƉA	Austroasiatic (?) – Old Khmer lŋɔː (680 CE in inscriptions)
e. 'hat, cap, helmet' HMUK/MU	Sinitic – Chinese 帽 *mào* 'hat, cap', OC *m^{ʕ}uk-s
f. 'wide-rimmed hat' DUN	Austroasiatic (no reconstruction)
g. 'flute/reed woodwind' KHLOJ	Austroasiatic or Tai
h. 'mango' SWAAJ	Austroasiatic – Old Khmer svāy 'mango' (578-677 CE in inscriptions), but note Sanskrit *śyāva* 'the mango tree'

a. 'cotton' KPAS

The history of the spread of cotton processing into MSEA is not yet clear, but a South Asia origin seems likely (see Castillo et al. 2016). Correspondingly, a possible source for this form is Indic. Both Pali *kappāsa* 'cotton' and Sanskrit *kārpāsa* 'anything made of cotton' are viable options, though the medial /-r-/ of the Sanskrit form is rarely seen in languages of MSEA except in Old Khmer (and not even in Old Javanese *kapas* 'cotton') (see Pulleyblank 1981 for discussion). Early textual data includes Old Khmer *krapās* 'cotton' (modern Khmer *kapaah* 'cotton') dating to 803 CE. The Vietnamese word *vải* 'cloth of cotton' (with semantic shift, while *bông* 'cotton', possibly derived from the homophonous form meaning 'flower', took over the status of 'cotton') from Vietic *k.paːs 'cotton' marks it as a pre-tonogenesis form, potentially dating it at least to the late-1st millennium CE. Timing of the borrowing in Tai is less certain, especially with a level tone category, suggesting borrowing after tonogenesis. Borrowing from Vietnamese is not impossible, but there is currently insufficient data to verify or refute that scenario. It is also widespread in Malayo-Polynesian and is attested in Old Javanese, giving it historical depth and providing more potential evidence of early maritime trade in the South China Sea.

Comparative Data for 'Cotton' KPAS
- Indic – Sanskrit *kārpāsa* 'cotton', Pali *kappāsa* 'cotton'
- Austroasiatic – Aslian (e.g., Semai *kapas* 'cotton' (purportedly via Hindi)), Bahnaric (Proto-Bahnaric *kpaːs 'cotton'), Katuic (Proto-Katuic *kpaas 'cotton plant'), Khasic (e.g., Proto-Khasic *knpaat 'cotton' (uncertain relatedness)), Khmeric (e.g., Surin Khmer *kbaːh* 'cotton'), Khmuic (e.g., Khmu *pʰaːj* 'cotton' via Tai?), Mundic (e.g., Korku *kapusu* 'cotton'), Palaungic (e.g., Riang *paj^{1}* 'cotton'), Pearic (e.g., *kpaːˀt* 'cotton'), Vietic (Proto-Vietic **k-paːs* 'cotton cloth')
- Daic – Proto-Tai *faj^{A} 'cotton' (Li 1977), Thai *ˈfâay* 'cotton', Lao *káp paː sǐː* and *fäːy* 'cotton'
- Malayo-Chamic – Malay *kapas* 'cotton', Rhade *kpaih* 'cotton' (also widespread in Western-Malayo-Polynesian languages)

b. 'net (to catch animals)' JAL

In MSEA, the JAL form referring to netting to catch animals occurs throughout both Austroasiatic and Malayo-Chamic. Archaeological evidence of fishnet stone weights date back thousands of years in MSEA (e.g., Nguyen 2005), which shows netting has substantial historical depth in the region. However, I can find no supporting ethnohistorical information about the spread of nets to catch fish or other animals from India to MSEA. Nevertheless, various Sanskrit and Pali words with the *jal-* root with meanings related to nets or netting are strongly suggestive of an Indic source. Old Khmer inscriptions of *jala* 'net' date back as far as 922 CE. It has also been borrowed into Austroasiatic languages outside of MSEA, including Munda and Khasic, but that almost undoubtedly occurred after their migration to those areas.

Comparative Data for 'Net (to catch animals)' JAL

- Indic – Sanskrit *jālam* 'net, snare' (also *jal* 'to cover (as with a net)'), Pali *jāla* 'a net'
- Austroasiatic – Aslian (e.g., Semai *bʌɟala* 'to fish with a net'), Bahnaric (Proto-North and South Bahnaric *ɟaːl 'net'), Khasic (e.g., Khasi *ɟaːr* 'net' (Viable considering [r] coda?)), Khmeric, Khmuic (e.g., Tay Hat *jaːl* 'casting net'), Munda (e.g., Juang *jalɔ* 'a net for catching fish or birds')
- Malayo-Chamic – Malay *jala* 'fishing net', Proto-Chamic *ɟaːl (also Old Javanese *jāla* 'net (to catch birds, fish, etc.'))

c. 'Flute/Reed woodwind' PI

The archaeological record naturally lacks evidence of musical instruments of biodegradable materials, but Dong Son (c. 500 BCE to 200 CE) bronzes have images of woodwind players. Images of musicians playing flutes are also on both Angkorian and pre-Angkorian temples in Cambodia (Kersalé 2023). Old Khmer *pi* 'flute' (modern Khmer *pɤːj*) is seen in inscriptions dating back to 962 CE. The wordform is a viable instance of sound-symbolism in its initial coining. Nevertheless, the PI wordform is found in major branches of Kra-Dai, including Tai (e.g., White Tai *pi*^{2}), Hlai (e.g., Hlai *pi*^{53}), and Kra (e.g., Buyang *pi*^{24} *luə*^{11}), so the most probable scenario is that it is a Daic loanword in Austroasiatic languages, unless ethnohistorical evidence shows otherwise. The implication of the date of the inscription is that the Daic expansion is slightly before the 2nd millennium. This provides some support for Pittayaporn's hypothesis of the Daic expansion in the second half of the 1st millennium CE, though this evidence potentially pushes the date towards the later part of that time. Nevertheless, the textual date is at the edge of the turn of the millennium, and this is the earliest instance of a possible Tai loan into Khmer so far, so we can still assume that most Daic loanwords into other languages in MSEA were borrowed in the 2nd millennium.

Comparative Data for 'Flute' PI

- Austroasiatic – Bahnaric (e.g., Tampuan *pəi* 'flute with 8 holes'), Katuic (e.g., Kui *peː* 'kind of bamboo flute'), Khmeric, Khmuic (e.g., Khsing-Mul *piː* 'flute'), Monic (e.g., Nyah Kur *píi* 'woodwind'), Palaungic (e.g., Riang *pi*^{1}), Pearic (e.g., Chong *piː pok* 'bamboo flute')
- Daic – Proto-Tai *pu̯i?^{B} 'flute' (also in Hlai and Kra)

d. 'sesamum/sesame' LƉA

Sesame may have been domesticated originally in South Asia, and the earliest archaeological evidence of processed sesamum in MSEA is in the late 1st millennium on the Malay-Thai peninsula (Castillo et al. 2016:1265). There is no apparent Sanskrit or Pali source of the LƉA wordform, and Blust (2010: https://www.trussel2.com/ACD/acd-s_l.htm#32978) posits that no etymological source has been identified for the form he reconstructs in Malayo-Polynesian. As for textual data, this wordform appears in early Khmer inscriptions in 680 CE (Old Khner *lṅo ~ liṅau* /lŋɔː/ 'sesame', modern Khmer *lŋɔɔ*). It is also in Old Javanese, but that post-dates the Khmer inscription by some centuries. While there is no clear archaeohistorical evidence, considering the earliest textual evidence, it is possible that Old Khmer is the innovator of this word after the introduction of the use of sesame, and that wordform subsequently

spread throughout the Austronesian maritime trade region. This is tentative as there is insufficient archaeohistorical evidence to provide additional points of geographic or chronological evidence.

Comparative Data for 'sesamum/sesame' LŊA

- Austroasiatic – Bahnaric (Proto-Bahnaric *lŋaː 'sesame'), Katuic (e.g., Pacoh *la.ŋeː* 'sesame'), Khmeric (e.g., Surin Khmer *lŋuːa* 'sesame'), Khmuic (Proto-Khmuic *lŋaʔ 'sesame'), Monic (Proto-Monic *lŋaw 'sesamum indicum'), Palaungic (e.g., Lamet *ŋáː* 'sesame'), Pearic (e.g., Chong *lŋuː* 'sesame')
- Daic – Proto-Southwest Tai *ŋa^{A} 'sesame'
- Malayo-Chamic – Malay *lĕnga* 'gingelly oil (from sesamum indicum)', Proto-Chamic *laŋa (cf. Old Javanese *lĕña* 'sesame', Proto-Malayo-Polynesian *leŋa 'sesame')

e. 'hat, cap, helmet' MU (and MUK in the 2nd millennium)

Like other products of textiles and fibers, material archaeological evidence from early history in MSEA is lacking, hence the reliance on less concrete historical information. Early Chinese texts describe a mandate in 1st century CE Han-controlled northern Vietnam of Chinese daily cultural practices, including headwear and footwear (Taylor 1983:26). Vietnamese *mũ* 'hat' has pre-tonogenesis status in Vietnamese, with the tone category dating it Late OC, and thus in the first centuries of the 1st millennium CE. This wordform is found only in four Austroasiatic branches, all inside or near Vietnam, suggesting borrowing via Vietnamese, with no clear chronological information. The related MUK form for 'hat' in MSEA likely dates to the 2nd millennium after the Daic expansion (but note the *hm onset in Proto-Khmuic, Proto-Palaungic, and Mon, suggesting early borrowing), and that form is even more widespread than the MU form. Kra-Dai languages appear to have borrowed the OC word when final *k was retained, whereas Vietic borrowed it after the loss of *k, but still before tonogenesis in Chinese. Both forms are presented in the data to show the differences in their distribution in the region.

Comparative Data for 'hat, cap' MU

- Sinitic – 帽 mào 'hat, cap', OC *mˁuk-s, MC mawH
- Austroasiatic – **MU**: Bahnaric (e.g., Mnong *muː* 'hat'), Katuic (e.g., Katu *muː* 'hat'), Khmuic (e.g., Khsing-Mul *muː* 'hat'), Vietic (only in Vietnamese); **MUK**: Aslian (e.g., Tonga *muak* 'hat'), Bahnaric (e.g., Sedang *mok* 'hat', and ten other languages), Katu (e.g., Ngeq *muak* 'hat', and several other languages), Proto-Khasic *mɔʔ, Khmeric (e.g., Khmer *mùːək* 'hat'), Proto-Khmuic *hmuək, Mangic (e.g., Mang *mɨək*^{7} 'hat'), Monic (e.g., Mon *hamok* 'hat', and several other lects), Proto-Palaungic*hmɔk, Pearic (e.g., Chong *muak* 'hat'), Vietic (e.g., Thavung *muak* 'hat')
- Daic – **MU**: None; **MUK**: Proto-Tai *hmuak (Li 1977) (also widespread in Kra-Dai languages in southern China)
- Tibeto-Burman – **MU**: None; **MUK**: In many languages both inside and outside MSEA

f. 'wide-rimmed hat' DUN

The DUN wordform for the Southeast Asian and southern Chinese style conical hat is contained in a geographic region of neighboring eastern Austroasiatic and Chamic languages. I have not located ethnoarchaeological studies that posit a history of this iconic regional wide-rimmed hat. However, a bronze image of a figure wearing a conical hat on a Dong-Son bronze (p.c. Charles Higham) demonstrates the possibility of a local lexical innovation, though there is no clear evidence of how long prior this style was innovated. In Vietnamese, the word has a nasal /n/ onset, an /ɔ/ vowel from earlier *u, and a tone category indicating a pre-tonogenesis development, so the word dates to at least the 1st millennium, if not before the Common Era earlier in the Dong-Son period. With the potential date to the BCE period, it is less likely to originate in Chamic, which may instead have been the recipient. I have not found this word in MSEA Tai languages. Speakers of those languages brought their own word with the expansion, a probable Chinese loanword (Chinese 笠 *lì* 'bamboo hat', OC *k.rəp, MC lip), which then appears to have spread into Austroasiatic languages in the 2nd millennium.

Comparative Data for 'wide-rimmed hat' DUN
- Austroasiatic – Bahnaric (e.g., Stieng *duən* 'wide hat of straw'), Katuic (Proto-Katuic **ɗuan* 'conical hat'), Khmeric (e.g., Khmer *duən* 'conical straw or leaf hat'), Vietic (Proto-Vietic **ɗɔːnʔ* 'conical hat')
- Malayo-Chamic – Proto-Chamic **ɗuan* 'conical hat'

g. 'Flute' KHLOJ

The KHLOJ is another word referring to a woodwind instrument, as in subsection d of 3.4. Old Khmer *kluy* 'flute' (modern Khmer *kʰloj* 'flute') is found in inscriptions from 994 CE, in a similar period as PI 'flute'. While it is in several Tai languages, these lects are only in MSEA, not outside, a situation suggesting possible borrowing from Austroasiatic into Southwest Tai languages. However, the phonological form matches both Khmer and Tai phonotactics (i.e., the [kʰl] onset cluster), and the PI 'flute' wordform appears to be a loanword from Daic in Austroasiatic. Thus, it is not possible to claim which is the donor and which is the recipient language without additional informative data.

Comparative Data for 'Flute' KHLOJ
- Austroasiatic – Katuic (e.g., Bru *khu:j* 'flute'), Khmeric, Monic (e.g., Nyah Kur *khlúuj* 'flute'), Pearic (e.g., Chong *kʰluj* 'flute')
- Daic – Thai *kʰlùy* 'flute', Lao *kʰūy* 'flute', Saek, Phuan, etc.

h. 'Mango' SWAAJ

While the history of mango cultivation may involve multiple instances of domestication, regarding its entry into MSEA, one possible situation is the spread of mango cultivation from South Asia to Southeast Asia in the 4th to 5th centuries (Warschefsky et al. 2019:2023-2025). Old Khmer *svāy* 'mango' (modern Khmer *svaaj* 'mango') appears in pre-Angkorian inscriptions dated to 578 to 677 CE. Sanskrit *śyāva* 'the mango tree' (Apte 1957-1959) has a vaguely similar form, and it is possible to speculate that irregular phonological adaptation (e.g., metathesis when borrowed) and/or dialectal variation accounts for the differences. However, considering the uncertain reasons for phonological differences, we cannot yet support the claim of an Indic origin of this word. For now, the evidence supports an Old Khmer lexical innovation, or least the conduit for the spread of this wordform.

Comparative Data for 'Mango' SWAAJ
- Austroasiatic – Bahnaric (Proto-West-Bahnaric **swaːj* 'mango'), Khmeric (e.g., Surin Khmer *swaːj* 'mango'), Pearic (e.g., Pear, Chong *swaj saː* 'mango'), Vietic (e.g., Vietnamese *xoài* 'mango')
- Daic – Lao *sá wăːy, suăːy* 'mango tree, mango'

4 Concluding observations

To conclude, I review the methodology in this study, summarize the key issues of the source language groups and means of diffusion of loanwords, and consider research paths this research could support, including issues of ethnolinguistic history in MSEA and implications for other areas of human history research.

Research method: In this study, many languages in MSEA are shown to share words with similar phonological shapes and meanings. Lexical data in semantic domains is collated from large lexical databases and digital dictionaries and comparable wordforms are noted. To establish relatedness of the wordforms, phonological patterns seen in wordforms shared by many languages (e.g., not only two languages with limited scope) help to establish their relatedness, and this excludes problematic items shown to more likely be instances of chance partial similarity. In addition, the words in this study fit into semantic domains, which can be seen in relation to ethnohistorical and archaeological information, thereby providing additional supporting evidence of lexical borrowing as well as information about the initial timing of borrowing. Finally, by identifying the earliest evidence of the words, we can determine potential original languages—whether the original innovators of the words or recipient languages that

then spread the words. Overall, in this approach, the degrees of certainty of wordform relatedness are increased and chronology of the borrowings can be determined with reasonable certainty.

Main donor languages and direct versus indirect borrowing: The lexical evidence shows significant sociocultural contact resulting from early language contact with Indic and Sinitic (sources of 8 words and 9 words in this study respectively). In addition, Old Khmer appears to have spread a number of words (6 Austroasiatic words, generally attested in Old Khmer inscriptions), though mostly in the latter part of the 1st millennium. However, while the original sources of words are usually clear, the path and timing of their spread are less so. In many cases, there is some evidence of the spread of words via other language conduits, such as Sinitic loans via Tai or Vietnamese or Indic loans via Old Khmer. This too offers some indication of chronology (e.g., determining the earliest instances of Sinitic loans via Tai only in the 2nd millennium).

Further ethnohistorical linguistic queries: While this study offers a starting point for these words, explaining their overall histories, and that of the associated objects, would require additional study of both historical linguistics (e.g., the timing of the borrowing of Chinese 'hat', with final [k] in some languages, zero codas in others, and words in some Austroasiatic languages with [hm] onsets borrowed via Tai, etc.) and ethnohistorical information (e.g., when Chinese-style glazed pottery was first introduced into the Khmer kingdoms region, etc.).

Also, while this study is a historical linguistic one, it utilizes archaeohistorical information to clarify and analyze the etymological research. As a result, it studies language history in a way that straddles sociocultural history. Questions of language contact necessarily involve questions of sociocultural contact, so some speculations can be made at this point.

- The words in this study represent significant influence on sociocultural and technological practices, especially in the domains of metallurgy and ceramics. The spread of such practices also suggests situations with impactful language contact and even bilingualism to transmit these techniques. In addition, some trade items may also represent changes at the societal level, such as headwear (practical items and social indicators) and carts (e.g., effective usage and social status markers, etc.). Individual items or cultural domains could be studied in more detail using the preliminary data in this study.
- In northern Vietnam, the earliest evidence of loanwords may be 'iron' and possibly 'tile', both of which have corresponding archaeological evidence in the last centuries BCE: this is not strong evidence of widespread bilingualism in Sinitic and Vietic. It is only in the 1st century CE that there is sufficient lexical evidence to suggest more sociocultural contact and influence from Chinese. Details of those two aspects of material culture potentially from the north could be considered in light of the data and observations herein.

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EARLY SINO-VIETNAMESE SUB-LAYERS AND THE CONSTRAINT AGAINST FINAL *-S IN PROTO-VIETIC

Thanh Viet Cao
National Tsing Hua University
kaoviet@gapp.nthu.edu.tw

Abstract
Alves (2018a) argues that between the atonal (with *-s) and tonal (without *-s) periods in Chinese, there was an intermediate phase when Chinese *qusheng* items without *-s were borrowed into then-atonal Proto-Vietic and resulted in *pingsheng* reflexes in ESV (i.e. those bearing *ngang/huyền* tone). Triplets in Early Sino-Vietnamese (ESV) data like <*lãi, lời, lợi*> 利 'interest' or <*cũng, cùng, cộng*> 共 'together' are among the evidence for this three-stage hypothesis. If this account is on the right track, however, it is tempting to ask on what grounds we can sub-stratify non-triplet items like *rèn* 'forge' (OC *[r]ˤen-s) or *tên* 'arrow' (OC *[ts]en-s) into (i) the ESV-I, i.e. the earlier sub-layer, but not (ii) the ESV-II, i.e. the later sub-layer including *lời, cùng*, or (iii) just the plain ESV without further timing specification. In this study, I will elaborate on the idea presented in Cao (to appear) that the tonal correspondence is insufficient to stratify such items due to a phonotactic constraint against final sequences of sonorant plus *-s in Proto-Vietic, then discuss the consequences of this complementary-internal factor for these puzzling cases.

Keywords: historical phonology, Old Chinese loans, Sino-Vietnamese readings, Proto-Vietic phonotactics.
ISO 639-3 codes: vie

1 Introduction

Marginal data uncovered from a marginal lect spoken in a marginal place like Early Sino-Vietnamese (ESV)[1] (i.e., the pre-Tang/Tang loans) sometimes offers fascinating glimpses into the evolution of the Chinese language. Let me take two examples, one is old, and one is new, to illustrate this point. First, as Pulleyblank (1977:186) pointed out (citing data from Haudricourt 1954b:363), the final *-j reconstructed in Old Chinese for Middle Chinese words[2] whose *yin* final (i.e. ended in a vowel or glide) is partially grounded on the fact that this final is still retained in a number of ESV items (and early Sinitic loans in Korean also) as evidenced in 'silkworm moth' *ngài* (< OC *ŋˤaj 蛾), 'grind' *mài* (< OC *mˤaj 磨), 'to move' *dời (*< OC *laj 移*)*, 'to ride' *cưỡi* (< OC *[g](r)aj-s 騎), 'to send' *gửi/gởi (*< OC *C.[k](r)aj-s 寄), etc. The second example concerns the second element in the toponym *Tam Soa*, a three-river conflux in Ha Tinh province, Central Vietnam (i.e. a part of the *Huanzhou* 驩州 region during the Sui-Tang eras). This item, phonemically represented as /ʂwa^{a1}/ <*soa*>, is likely to be a reflex of Old Chinese (OC) for 叉 'cross' (LSV *xoa* /swa^{a1}/). If this is a valid case, then its retroflex initial is the evidence for reconstructing this feature in the OC etymon (e.g., *sh-**r**-aːl by Zhengzhang 2013:294). Evidence of this kind, however, unlike the former, seems to be quite sporadic and rare in the ESV stock.

This study mainly involves a subset of ESV along the lines of the first examples that presumably has some bearing on the tonogenesis of both Chinese and Vietic. Accordingly, a portion of MC *qusheng* (< Old Chinese *-s) etyma are reflected in Vietnamese with atypical A-tone (*ngang/huyền*) forms, in addition to typical C-tone (*ngã/nặng*) and B-tone (*sắc/nặng*) forms in Early Sino-Vietnamese (ESV)

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[1] Abbreviations: SV = Sino-Vietnamese, ESV = Early Sino-Vietnamese, LSV = Literary Sino-Vietnamese, VSV = Vietnamized Sino-Vietnamese, OC = Old Chinese, LOC = Late Old Chinese, MC = Middle Chinese, EMC = Early Middle Chinese, LMC = Late Middle Chinese.

[2] Data for Old & Middle Chinese are extracted from Baxter & Sagart (2014), Kroll (2017), and the Multi-function Chinese Character Database (Research Centre for Humanities Computing, CUHK). For ESV data, please refer to Alves (2018a, 2022) and Cao (to appear).

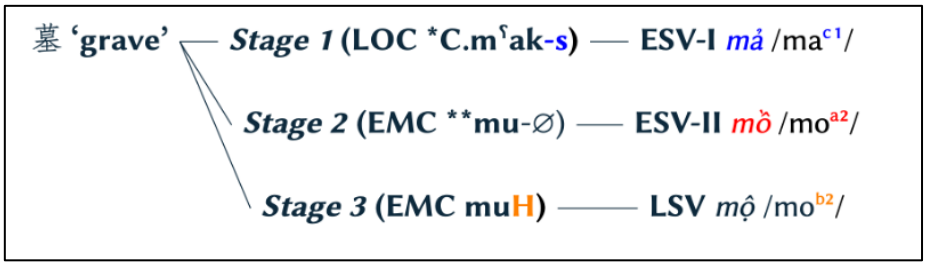
and Literary Sino-Vietnamese (LSV) layers, respectively. Two typical examples of these puzzling ESV items are the triplet of 墓 'grave' and the doublet of 練 'to forge' in Table 1.

***Table 1**: ESV puzzling forms*

Gloss	Old Chinese	Middle Chinese	ESV	LSV
墓 'grave'	*C.mˤak-s	muH	mả/mồ	mộ
練 'to forge'	*[r]ˤen-s	lenH	rèn	luyện

Unlike Wang Li (1948), who takes these forms to be the so-called Vietnamized Sino-Vietnamese (VSV) without any transparent phonological grounds, Alves (2018a) assumes these to be early reflexes of Early Middle Chinese (EMC) borrowed into atonal Proto-Vietic as toneless forms due to their timing deviation of tonogenesis. This is the gist of his three-stage hypothesis on relativized tonogenesis in Chinese and Vietic, as represented as follows.

***Figure 1**: A simplified schema of Alves' (2018a) three-stage hypothesis*



Given Alves' (2018) three-stage hypothesis, A-tone reflexes for *qusheng* etyma (e.g. *mồ* 'grave') can be regarded as items of an ESV sub-layer (i.e. the ESV-II) mediating between the canonical ESV (i.e. the ESV-I) and the LSV strata. If this is the case, it is tempting to ask whether this characterization can be generalized for all A-tone ESV reflexes for *qusheng* etyma. In other words, on what grounds can we specify the incorporating time of non-triplet elements like *rèn* 'forge' (OC *[r]ˤen-s) or *tên* 'arrow' (OC *[ts]en-s)? Should we regard them as (i) the ESV-I, i.e. the earlier sub-layer, but not (ii) the ESV-II, i.e. the later sub-layer including *lời, cùng*, or (iii) just the plain ESV without further timing specification? In this paper, I will elaborate on the idea suggested by Cao (to appear) that the tonal correspondence is not enough to stratify such items due to the existence of a phonotactic constraint against final sequences of sonorant plus *-s in Proto-Vietic. Then, I will discuss the consequences of this complementary, internal factor for these marked cases. Thus, this paper will be organized into three main parts: Section 2 will review the *pingsheng* for *qusheng* alternation observed in ESV and previous accounts of it (including Alves' three-stage hypothesis), Section 3 will be devoted to discussing the phonotactics of Proto-Vietic and the constraint against final *-s, whereas Section 4 will concern the empirical consequences of this constraint.

2 *Pingsheng* for *qusheng* alternation and previous accounts

Sinitic is the most quantitatively significant non-Austroasiatic layer in the lexicon of Vietnamese. Presumably, there are three main Sinitic strata incorporated into Vietnamese at three different stages from three main stages of donors, namely: (i) Early Sinitic loans from (Late) Old Chinese/Early Middle Chinese (i.e. pre-Tang or Tang loans), (ii) Sino-Vietnamese Proper from Late Middle Chinese (i.e. post-Tang loans), and (iii) recent loans from various modern Chinese varieties (Wang Li 1948, Nguyễn T.C. 2000, Alves 2009, 2016, 2018a, 2022, Vũ Đ.N. 2011, Phan 2013, among others). More importantly, these three chronological macro-layers of Sinitic loans in Vietnamese have shown many phonological characteristics reflecting internal accommodation of the external features throughout the evolution from Proto-Vietic to Modern Vietnamese. Among these traits, the tonal correspondence in general and the tonogenesis of both Chinese and Vietic have played a crucial role in characterizing different phonological layers of Sinitic loans in Vietnamese.

Thus, since Mei's (1970) observation about the differences in tone categories between different SV reflexes of the same Sinitic etymon, it has become clear that there are two, not just one, tonal alternations in SV words borrowed before versus during/after the Tang dynasty (see Table 2). Also since then, in addition to the segmental criteria, suprasegmental correspondences have shown a more helpful, if not the most important, role in stratifying Sinitic loanwords in Vietnamese.

Table 2: *Early Sino-Vietnamese vs. Literary Sino-Vietnamese tonal contrasts*

1. Shangsheng-qusheng	ESV hỏi/ngã (C)	LSV sắc/nặng (B)
	ESV sắc/nặng (B)	LSV hỏi/ngã (C)
Example: 帽 'hat'	*mũ* (< OC *mˤuk-**s**)	*mạo* (< MC mawH)
補 'to mend'	*vá* (< OC *[Cə]-pˤa**ʔ**)	*bổ* (< MC puX)
2. Pingsheng-qusheng	ESV ngang/huyền (A)	LSV sắc/nặng (B)
Example: 鍊 'forge'	*rèn* (< OC *[r]ˤen-**s**)	*luyện* (< MC lenH)

More concretely, puzzling cases like ESV *rèn* (< OC *[r]ˤen-s) 鍊 'forge', not ***rẽn** as expected, have led some authors to posit that there is a portion of *qusheng* words that did not originate from final *-s but involved other factors (Wang 2006). However, this account cannot explain the many triplets found in Vietnamese, e.g., the cognate sets of 利 'profit' <*lãi, lời, lợi*> or 墓 'grave' <*mả, mồ, mộ*>.

More plausibly, these words seem to reflect different strata of Chinese loans in Vietnamese, as Norman (1979:272) suggested in considering the latter set (i.e. the triplet <*mả, mồ, mộ*>) as three items 'correspond exactly to the three strata' that he proposed for the Min dialects. As far as this typical case is concerned, Pulleyblank (1984:161) concurs with Norman in identifying mả as part of the oldest layer (i.e. ESV), whereas taking mồ as an item of an intermediate stratum between ESV and LSV. In addition to that, he remarks that the inconsistent representations of *qusheng* items in Vietnamese may have something to do with 'sufficiently different' perceptions of final *-s (which he assumes to correspond to an aspiration feature) in the donor versus the recipient. This explanation could have been on the right track if cases of *pingsheng-qusheng* alternation were too scarce and sporadic to be worth noting. However, several dozen of these cases have been found in Vietnamese, which suggests there must be some underlying pattern here. Moreover, his claim implies a vague degree-based difference between perceptions of final *-s.

Alternatively, what if there were a phase between LOC and EMC when (i) the final *-s was already gone, and it is this kind of intermediate derivation (i.e. LOC items without final *-s) that was borrowed into Vietnamese, or (ii) the final *-s had already become *qusheng* (H), but this suprasegmental feature in EMC was uninterpretable to the Vietic people by that time because the tonogenesis in their language, presumably, was yet to initiate? Concretely, Alves (2018a:5) proposes that pingsheng reflexes in Vietnamese might be remnants reflecting a medial period of losing final *-s (leading to *qusheng*) that occurred during the tonogenesis of Chinese, presumably between LOC and EMC periods. This is the gist of the three-stage hypothesis on the relative chronology of tonogenesis in Chinese and Vietic, as summarized in Table 3 below.

Table 3*: The three-stage hypothesis on the relative chronology of tonogenesis in Chinese and Vietic (revised from Alves 2018a:11-12)*

Donor's stage	**Evolution of tones**		**Relative chronology**	**Example: 墓 'grave (n.)'**
	Chinese	**Vietic**		
Stage 1 (*with ***-s***)	atonal	atonal	*pre-Han* or Han eras	ESV *mả* (< LOC *C.mˤak-s)
Stage 2 (*with **H***)	tonal	atonal	Jin-Tang era	ESV *mồ* (< EMC **mu)
Stage 3 (*with **H***)	tonal	tonal	post-Tang era	LSV *mộ* (< LMC muH)

Several significant implications can be drawn from this hypothesis. For example, given the ESV evidence suggesting that Vietic languages were still atonal during the Jin-Tang period, it goes without

saying that the chronology of tonogenesis in Vietic should be estimated at least a couple of centuries later than the 6th century as posited by Haudricourt (Alves 2018a:11) since the four tonal categories in MC were already found in *Qieyun*《切韻》of 601 CE and expected to be rendered as in LSV. Second, given the two possible donor forms for ESV bearing *pingsheng* during the second stage, i.e. a LOC without *-s versus an EMC without *qusheng* (H), the segmental correspondences from these words, as shown in the case *mồ* 'grave' above, indicate that they are more likely to be reflexes of EMC without *qusheng* than of LOC without *-s due to their overall convergence with LSV counterparts. Hence, the second scenario in which EMC's suprasegmental feature was uninterpretable to the Vietic people during that period might have happened more frequently than the first possibility in which LOC etyma without *-s was borrowed.

While Alves' hypothesis successfully addresses the many cases of ESV triplets by appealing to the timing deviation of tonogenesis in Chinese and Proto-Vietic, it is still unclear whether we can carry this account over all the *pingsheng* for *qusheng* cases found as ESV-II items on par with *mồ* or *lời*. In the next section, I wish to elaborate on the idea, developed by Cao (to appear), that in association with Alves' three-stage hypothesis, there could be another cause for this tonal insensitivity of Vietic people rooted in the phonotactics of Proto-Vietic, and considering this constraint will help us grasp a finer-grained account of ESV sub-layers, particularly doublets corresponding to OC etyma whose final cluster of nasal plus *-s (see Table 4).

Table 4: *Early Sinitic loans and LSV reflexes for OC nasal + *-s*

#	Gloss	Character	OC	MC	ESV-I	ESV-II	LSV
1	confuse (v)	亂 luàn	*[r]ˁo[n]-s	lwanH	*lẫn*	*lộn*	*loạn*
2	also	共 gòng	*N-k(r)oŋʔ-s	gjowngH	*cũng*	*cùng*	*cộng*
3	sentiment	念 niàn	*nˁim-s	nemH	*ngẫm*	*niềm*	*niệm*
4	sword	劍 jiàn	*s.kr[a]m-s	kjaemH	*gươm*		*kiếm*
5	advise (v)	勸 quàn	*C.qʷʰar-s	khjwonH	*khuyên*		*khuyến*
6	curtain	幔 màn	*mˁa[n]-s	manH	*màn*		*mạn*
7	arrow	箭 jiàn	*[ts]en-s	tsjenH	*tên*		*tiễn*
8	forge (v)	鍊 liàn	*[r]ˁen-s	lenH	*rèn*		*luyện*

3 Phonotactics of Proto-Vietic and the constraint against final *-s

First, it is worth noting that OC reflexes in Vietnamese bearing both nasal-final and tone C (*qusheng*/*hỏi-ngã* < *-h/-*s) are rarely found. They are even unavailable for the Austroasiatic stock, i.e. there is seemingly no place for Proto-Vietic sequences where a fricative *-h/*-s could follow a nasal. This is exactly the remark that Brunelle points out in his translation of Haudricourt's (1954a) classic paper:

> As predicted by Haudricourt's reconstruction, tone C (qù, hỏi/ngã) does NOT occur on nasal-final syllables of Austroasiatic stock, where it would imply earlier sequences of a nasal followed by /h/. Tone C on nasal-final syllables is only found in borrowings from Chinese, and in words of expressive origin (Ferlus 2004: 299, citing Maspero).

In fact, as far as Proto-Vietic phonology is concerned, it is illegal to have a final fricative *-h/*-s following not just a nasal but any kind of sonorant in Proto-Vietic. This characterization emerges from the fact that all Vietic languages seem to have no coda clusters (Alves 2011:477), or at least we can say that all of them have no final clusters between a nasal and a fricative (see Table 5).[3]

[3] All Vietic languages have single codas of three types: (a) final nasals /m, n, ɲ, ŋ/, (b) final voiceless stops /p,t,c, k/, and (c) offglides (i.e. semi-vowels) /w, j/. Some may have/retain additional codas like final fricatives /s, h/, final liquids /l,r/, and final glottal stop /ʔ/ (Alves 2021).

***Table 5**: Diverging inventories of codas in Vietic languages (Alves 2021: 478)*

Type	Viet	Muong	Cuoi	Poong	Ruc	May	Arem	Thavung	Kri	Maleng Bro
Fricatives Final -l/-r -ʔ	none none none	none -l (15 lects) none	none -l none	(-h) -l yes	-s, -h -l, -r no	-h -l, -ɽ yes	-h -l no	-s, -h none yes	none -r, -l no	none -r, -l yes

Obviously, this phonotactic constraint must have something to do with the unavailability of the word-shape of (Cv)CVC-s/h in the native stock and the scarcity of loans in such word-shape. Hence, though it is reported that the pattern *C(C)V-N-h can only be observed in some Chinese borrowings or "*words of expressive origin*" (Ferlus 2004:299, citing Maspero), upon a closer look into ESV, the scope of Chinese borrowings here perhaps should be restricted to later loans, i.e. LSV, only.
Given what we have discussed so far, I propose that there is a constraint against the final *-s (and *-h) following a sonorant in Proto-Vietic as follows.

(1) *The constraint against final *-s in Proto-Vietic*
The final sequence with a sonorant followed by a fricative is illicit in Proto-Vietic.

Next, it's tempting to ask why this constraint apparently applies to most but not all OC loans. Put differently, how can we accommodate the exceptions to the constraint above? Given the available data, as exemplified in Table 6, there are only three potential items of Early Sinitic loans (viz., *lẫn* 'confuse', *cũng* 'also', and *ngẫm* 'sentiment') which don't observe the constraint under discussion in Proto-Vietic, i.e. they bear tone C while having a nasal final in modern Vietnamese. However, in the first case, *lẫn* is not a transparent case at all because OC tentative initial [***r***-] is expected to be retained in the Early Sinitic loans layer as **r-** (as in *rèn* 'to forge', *rồng* 'dragon', etc.) not as **l-**. As for the second case, even though *cũng* seems to be less problematic than *lẫn* regarding phonological correspondences, its earlier status is attested by some tokens of it detected in later Nôm texts such as Tuệ Tĩnh's *Hồng nghĩa giác tư y thư*《洪義覺斯醫書》in the 14th-century (Alves 2018b) (though none of it is found in the 12th-century *Phật thuyết)*. Meanwhile, as Alves points out, the semantic correlation between *cũng* 'also' - *cùng* 'and' (as in *Nam **cùng** (với) Lan là sinh viên* 'Nam and Lan are students') also attests to the grammaticalizing cline ALSO > NP-AND proposed by Heine and Kuteva (2003:43). This suggests that *cũng* might have been borrowed before *cùng*. In the third case, ngẫm also seems comparable to the OC form from the tone (*ngã* corresponding to the final *-s) to the vowel (OC *i > ESV ə) and the coda perspectives. Nevertheless, the initial change from OC *n- to ESV velar nasal is rare (if not unattested) since OC nasals tend to be retained faithfully in ESV (e.g. 'hat' *mũ* (< ***m*ˁ*uk-s*), 'maid' *nàng* (< *nrjaŋ), 'silkworm moth' *ngài* (< *ŋˁaj), etc. These considerations make both *ngẫm* and lẫn not solid cases of ESV on par with *cũng.*

Thus, how can we account for the sole potential counter-item *cũng* then? Perhaps, as Alves (p.c.) suggests, it is very likely that in this case, Vietic people must have retained the breathy voice accompanied by the OC etymon, but not the segment ***-**s, and reinterpreted it as a C tone (lower pitch) later on. The breathy register has long been associated with lower pitch and final -h as characterizations of tone systems in Southeast Asian languages (Thurgood 2002:345, Brunelle & Ta 2021).

All things considered, it is safer to claim that nasal-final syllables bearing tone C could be found in proper Sinitic borrowings (i.e., LSV) but rarely seen in earlier layers. This is another piece of evidence bolstering the native-like status of Early Sinitic loans lexicon where they converge with the native Austroasiatic vocabulary in observing a phonotactic constraint on the final sequence of nasal plus fricative, namely: the final sequence with a sonorant (viz. (semi-)vowel, liquid, nasal) followed by a fricative is illicit in Proto-Vietic (i.e., #CV-N-**s**, #CvCV-N-**s)**. Given this constraint, we could have a finer-grained account for the *pingsheng-qusheng* doublets whose final nasal, along with Alves' (2018a) three-stage hypothesis. In the next section, I will characterize the diagnoses for both the sub-layers of ESV in light of the constraint against final *-s in Proto-Vietic and work out the empirical consequences.

4 Diagnostics for ESV sub-layers

Now we have realized that instead of assuming all *pingsheng* for *qusheng* words are reflexes of LMC without *-s forms due to tonogenesis timing mismatch, uniformly subsumed in the ESV-II, there is a portion of these are footprints of a nativizing process of dropping/ignoring the final *-s in LOC donor forms dictated by the phonotactics of Proto-Vietic, resulting in *pingsheng* reflexes retained in the Sino-Vietnamese lexicon. These LOC *pingsheng-qusheng* reflexes, thus, should be regarded as ESV-I items, not ESV-II ones on segmental grounds (e.g. *rèn* 'to forge', *tên* 'arrow', etc.) In addition to these ESV-I items in disguise, two more subsets of these early Sinitic loans can also be identified on segmental grounds, namely: later ESV loans, i.e. ESV-II, that tend to have identical segments with LSV (e.g. ESV-II *khuyên* vs. LSV *khuyến* 'advise'), and plain ESV ones that cannot be specified in terms of timing (e.g. *màn* 'curtain').

Setting tone aside, what grounds can we employ to distinguish ESV(I) from ESV(II) items? Below are the segmental diagnoses for ESV-I items and the stratifying results for the relevant cases.

- Initial-based indicators for ESV(I):

- OC initial retentions: *k-, *r-, *b, *p^h (> Middle Vietnamese *p^h > f-)
- OC initial alternations: voicing (*t- > ɗ-, *p- > ɓ-); fortition (*ts- > t-); spirantization (*C.k- > ɣ-)

(1) Vowel-based indicators for ESV(I):

- OC vowel retentions: *a, *e, *i, *o
- OC vowel alternations: diphthongization (*a > uo/iə, *e > ie); *u > o; *o > e

Table 6: *ESV-I items in ESV-II disguise*

#	Gloss	OC	MC	ESV(I)	LSV
1	眾 'crowded'	*tuŋ-s	tsyuwngH	đông	chúng
2	劍 'sword'	*s.kr[a]m-s	kjaemH	gươm	kiếm
3	放 'to release'	*paŋ-s	pjangH	buông	phóng
4	慣 'familiar'	*k^{ʕ}ro[n]-s	kwaenH	quen	quán
5	箭 'arrow'	*[ts]en-s	tsjenH	tên	tiễn
6	練 'to forge'	*[r]^{ʕ}en-s	lenH	rèn	luyện
7	樣 'manner'	NA	yangH	dường	dạng
8	敬 'to respect'	*kreŋ(ʔ)-s	kjaengH	kiêng	kính
9	印 'to seal'	*[ʔ]iŋ-s	jinH	in	ấn
10	片 'flat piece'	*$p^{hʕ}$e[n]-s	phenH	phên	phiến
11	便 'then, handy'	*ben-s	bjienH	bèn	tiện
12	弄 'play'	*[r]^{ʕ}oŋ-s	luwngH	rong/rông	lộng
13	陣 'period'	*lri[n]-s	drinH	lần	trận

Meanwhile, the signature trait of ESV-II items is that they tend to have identical segments with their LSV cognates (see Table 7).

Table 7: *Typical ESV-II items*

#	Gloss	OC	MC	ESV(II)	LSV
1	勸 'advise'	*C.q^{wh}ar-s	khjwonH	khuyên	khuyến
2	願 'wish'	*[ŋ]o[n]-s	ngjwonH	nguyền	nguyện
3	讓 'to yield'	*naŋ-s	nyangH	nhường	nhượng
4	嘆 'to lament'	*ŋ ˁar-s	thanH	than	thán
5	信 'believe'	*s-ni[ŋ]-s	sinH	tin	tín
6	分 'part'	*[m]-pə[n]-s	pjunH	phần	phận
7	算 'calculate'	*[s]ˁorʔ-s	swanH	toan	toán
8	韻 'rime'	*[m-q^{w}]<r>i[n]-s	hjunH	vần	vận

Other than ESV-I and ESV-II cases, there are cases where phonological evidence is insufficient to specify the borrowing time. The following case of *màn* 'curtain' is one of those. Regarding these cases, a plain label of ESV would be most appropriate.

Table 8*: Timing-underspecified ESV*

#	Gloss	OC	MC	ESV	LSV
1	幔 'curtain'	*mˁa[n]-s	manH	màn	mạn

5 Remaining issues and conclusion

In summary, unlike Old Chinese, Proto-Vietic lacks final clusters with a sonorant (including nasals) followed by a fricative, i.e. #CVN-s or #CvCVN-s. Thus, there is presumably a constraint against final *-s (and *-h) following a sonorant in Proto-Vietic since the final sequence with a sonorant followed by a fricative is phonotactically illicit in Proto-Vietic. Given this constraint, a large portion of early *qusheng* Sinitic loans (at least) in Vietnamese are expected to stay indifferent to the final *-s of the donor forms, resulting in A-tone reflexes.

In light of this observation, two sub-layers of ESV can be identified neater, i.e. ESV-I and ESV-II (besides a few underspecified cases). This constraint, along with Alves' (2018) three-stage hypothesis, provides a finer-grained stratification for both final nasal and final non-nasal cases of A-tone reflexes of early *qusheng* Sinitic loans in Vietnamese. Meanwhile, I leave open to the questions regarding comparable data in other Sinospheric languages for future extensions.

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REFLECTIONS OF VOICED INITIALS IN THE VERNACULAR CHARACTER TEXT OF THE TÀY WEDDING SONGS OF CAO BẰNG: HAN CHINESE LOANWORDS

David HOLM
Department of Ethnology, National Chengchi University
dholm@nccu.edu.tw

Abstract

It has long been recognized, by Haudricourt and others, that the Tày dialects along the border of Cao Bằng province in northernmost Vietnam retain voiced initials from proto-Tai. An archetypal example is the text of the Cao Bằng wedding songs edited by Nguyễn-văn-Huyên and published in 1941. This paper will present an analysis of some of the characters used to represent words with voiced initials in this text, concentrating for reasons of space on Han Chinese loanwords. It will be shown that in a substantial number of cases, such words are written with Chinese characters or vernacular compound characters with graphic components that had voiced initials at the Early Middle Chinese stage. This information will be linked with the author's survey data on Tày, Nùng and Zhuang vernacular scripts, and two recent articles on voiced initials in Tày shamanic ritual texts from Trùng Khánh district in northern Cao Bằng and a more southerly location in Bắc Kạn province. These findings provide evidence for assessing the age of the vernacular Tày script.

Keywords: voiced initials, Tày, vernacular character scripts, proto-Tai
ISO 639-3 codes: Visit http://www.loc.gov/standards/iso639-2/ or search in Wikipedia entries to find ISO codes for all languages in your paper.

1 Introduction

The Tày are a large and well-established population in the northern provinces of Vietnam, with a history of settlement going back several millennia.[1]

It has long been recognized that some of the Tai dialects of northernmost Vietnam retain the voiced initials of proto-Tai. This phenomenon was first noted by André Haudricourt in a brief announcement in 1948 and then followed up in a series of special studies (Haudricourt 1948 and 1958:163 ff). The topic has since become a continuing point of focus in Comparative Tai linguistics, pursued most recently by Pittayaporn and Kirby, who conducted fieldwork-based instrumental studies on the phonetic contours of voiced initials in Trùng Khánh district in Cao Bằng province, one of the districts in which voiced initials are preserved.[2]

Until very recently, what has not been documented in international scholarship is that the script in vernacular Chinese-character manuscripts from this area also shows clear reflections of these voiced initials. In fact, careful analysis of the Chinese characters – or phonetic components of compound graphs used to write words with voiced initials – has revealed that, in a very substantial number of cases, the characters or graphic components chosen to write these words had voiced initials themselves at the Early Middle Chinese stage in the historical development of Chinese phonology. As is well known,

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[1] A substantial proportion of the Tày population in the north dates back nearly to the time of the earliest human habitation in this area: see *Các Dân Tộc ở Bắc Kạn* 2003:77–78. This is in line also with DNA evidence, on which see Li Hui (2002).

[2] Pittayaporn and Kirby (2016). See also Zhang Junru (1987), Ross (1996), Theraphan (1997), and Hoàng Văn Ma (1997).

these voiced initials in Chinese were subsequently lost, becoming unvoiced by the Late Middle Chinese stage dating to the later part of the Tang dynasty.

I have recently written two articles documenting this connection, a shorter book chapter in English concentrating mainly on bilabial voiced initials and Chinese loanwords, and a longer article in Chinese investigating a wider range of proto-Tai voiced initials, including bilabials, alveolars, and velar initials as well as Chinese loanwords (see Holm 2023 and 2024). The traditional manuscript selected for this initial investigation was a ritual manuscript from Trùng Khánh district, 'Crossing the Seas', which is recited by Tày ritual specialists called Then.[3] With a length of 659 lines of verse, this text was long enough to provide a fairly full range of Tày lexical items, including those with voiced initials. A very similar 'Crossing the Seas' text of comparable length from a different dialect area further south was used as a comparator (Bế Viết Đẳng 1992).

The manuscript from Trùng Khánh was published in the form of a transcription of the original character text, a transcription into Romanized Tày, and a translation into Vietnamese (*Quốc ngữ*). It was the transcription into Romanized Tày that provided the indication of voiced initials, with voiced bilabial /b-/ written with /v-/, and so on. Investigation of individual lexemes was then used to confirm the morphemes in question, and then followed up with relevant reconstructions of proto-languages and readings of early and late Middle Chinese and Sino-Vietnamese (hereafter SV).[4]

I have also conducted a very preliminary survey of Tày and Nùng traditional manuscripts in the northern provinces of Vietnam (Holm 2020b), along the same lines and with the same protocols as those used in *Mapping the Old Zhuang Script* (Holm 2013). What we found in the Trùng Khánh text was further confirmation that the present-day Tày vernacular script in this area is mixed, with a more recent layer and a layer that dates back many centuries. As demonstrated in the Tày and Nùng survey article, the older layer has quite a few usages in common with the old Zhuang character script in the central part of Guangxi and Yunnan, that is, in areas along the Xijiang 西江 (West River) river system where the script is based on older readings, rather than the more recent readings based on Southwestern Mandarin found further north and in Guizhou (on which see Holm 2013, *passim*). The newer layer in the Tày script shows almost none of these commonalities with Zhuang, and is largely *sui generis*. It is also relatively uniform and is found across all the provinces in northern Vietnam thus far surveyed. Historical evidence points to the later 17th century as the time when this newer layer took shape.

2 The Wedding Songs

A collection of Thổ (Tày) wedding songs was edited and published by Nguyễn Văn Huyên in 1941 (Nguyễn-văn-Huyền 1941). This work contains songs from two different provinces in northern Vietnam, Cao Bằng and Lạng Sơn. It is the Cao Bằng wedding songs that provide evidence of the retention of voiced initials. For many years, it seems, these were the only materials on the written Tày (Thổ) language available to the Vietnamese scholarly community. The historian Đào Duy Anh wrote a monograph on the history of the Vietnamese character script that was published in 1975, and he included an appendix on the Tày vernacular script and its relationship with Chữ Nôm.[5] The wedding songs were also used by foreign scholars including André Haudricourt in their discussions of the historical phonology of the Tai languages. The wedding songs are thus a body of material of considerable importance in the development of scholarly investigations into the Tai languages. One can truly say that this is a classic text, well worth careful exploration.

The 1941 work itself contains an introduction, the wedding songs from Lạng Sơn (1412 lines), and the wedding songs from Cao Bằng (304 lines). For each of the two texts a transcription of the character text and the romanized rendering of the Tày lyrics are set out on opposite pages, followed separately by a French translation and notes. The notes are relatively sparse and mainly ethnographic in nature, explaining marriage customs mentioned in the lyrics. The romanized rendering of the Tày lyrics is based on Vietnamese *Quốc Ngữ* romanization, but with spelling that was evidently intended to represent the

[3] The text was published in Viện Nghiên cứu Hán Nôm, 2011.

[4] A list of such abbreviations is appended to the end of the main text.

[5] Đào Duy Anh (1975). The appendix is entitled 'Tím hiểu Chữ Nôm Tày', and is found on pp. 210–221.

local pronunciation. One thing absent from this work is word glosses. Furthermore, there is no glossary at the back of the book that would provide information on the meaning of individual words in the text.

I will discuss the spelling conventions Nguyễn Văn Huyên applies to the Cao Bằng song lyrics further below. These spellings are clearly different from those of the Lạng Sơn lyrics in the same volume. F.M. Savina's 1910 dictionary was available at the time, but the more compendious dictionaries of what was then referred to as Tày-Nùng were only published in the mid-70s.[6] Nguyễn Văn Huyên's spelling does not conform to either of these sources.

3 Analytic Procedures

These spelling choices are different from those currently employed in the transcription of Tày. Most dictionaries of Tày or Tày-Nùng tend not to represent voiced initials anyway, being based on a dialect further south.[7] There are two exceptions: the dictionary of the Tày character script (Chữ Nôm Tày) compiled by Hoàng Triều Ân (2003), and a more recent dictionary of Cao Bằng Tày compiled by Hoàng Triều Ân and Vương Toàn (2016). Identifying morphemes in the Cao Bằng marriage songs (hereafter CBMS) requires searching the available range of dictionaries for words spelt with different initial consonants (p- instead of v-, t- instead of d-, k- and qu- instead of g-, and so on), and dictionary meanings that match some word or phrase in the French translation or can plausibly be linked with the French translation semantically. Nguyễn's spelling of rimes and assignation of tone categories likewise may vary from what have become standard renderings in Tày dictionaries.

Another set of difficulties results from the fact, as mentioned above, that there are no word glosses attached to the character text and Tày transcription. We have the French translation and notes, but the French translation, while reasonably accurate, is not always word for word, and in some cases presents renderings which are context-based rather than literal. If we really want to understand the Tày lyrics, then, we have no option but check each morpheme one by one.

A Vietnamese edition of Nguyễn's scholarly writings was published after his death, complete with a Vietnamese translation of the wedding song lyrics.[8] I was hoping that the Vietnamese translation would provide additional clues for identifying some of the more obscure morphemes, but it turns out that the Vietnamese translation is based on the French, and not on the Tày. It therefore replicates the wording of the French, along with its occasional mis-renderings.

I have made appropriate enquiries, and it turns out that there is not as yet a critical annotated edition of this important text. One is badly needed. In preparing the notes for one (80 pages so far), what I have found is that many morphemes can only be confidently identified (and related in some fashion to the wording of Nguyễn's French translation) if all the words in the same line or stanza are identified through a comparably meticulous analysis of all the possible identifications. Analyzing the words with voiced initials, then, needs to be set in a properly analyzed context. In some cases it will not even be possible to say whether a given word is operating as a noun, verb, or adjective unless the whole line is parsed.

Among the Tai languages, Tày is the Central Tai language variety most poorly represented in international scholarship. Documentation on various Nùng varieties is comparatively well-developed (see e.g. Saul and Wilson 1980). This means that it is worth documenting the process of morpheme identification in greater detail than usual. Tày is reasonably well-served by a range of dictionaries, but with the exception of Savina's earlier Tày-Việt-French dictionary, these are all in Vietnamese. We also have the data from the EFEO surveys.

Morpheme identification is rendered more complex because the CBMS lyrics themselves are bilingual, being a combination of Tày and Vietnamese, and with sometimes whole lines of verse in Vietnamese or SV. I mentioned this circumstance in the recent article surveying Tày and Zhuang

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6 Hoàng Văn Ma et al. (1974) for Tày-Nùng-Việt (hereafter TNV), and Mông Kí Slay et al.(1974) for Việt-Tày-Nùng. A more recent dictionary devoted specifically to Tày is Lương Bèn, ed.-in-chief (2011).

7 For a general overview of Tày dialect regions see Hoàng Văn Ma (1997).

8 Nguyễn Văn Huyền (1995). The Vietnamese translation of the marriage songs is found in volume 1 pp. 787–797.

vernacular scripts, and Đào Duy Anh also remarked upon it, although his explanation was different (Holm 2020b:207).

4 Overview

A total of 88 words with voiced initials are found in the 304 lines of the CBMS. This is a very considerable number. For reasons of space the present paper concentrates on the Han Chinese loanwords found in the lyrics. For each of the following words, the Tày transcription of a sample line will be presented, along with the French translation of the line. Analysis will involve identification of the context and clarification of any graphic or syntactic ambiguities. Information on readings in Early Middle Chinese (EMC) and Late Middle Chinese (LMC) will be based on Pulleyblank's dictionary, and SV readings and Vietnamese loan-words will also be noted.[9] Finally, the correspondences of Tày readings with Middle Chinese and SV will be discussed.

1. 茶 *già* 'tea'

This word is found eight times in the text. Additionally, the graph is found twice to represent homophonous Tày words, i.e. borrowed phonetically, and also found as a phonetic component in compound vernacular graphs.

The most common spelling is *già*, found on lines 8, 21, 22, 84, and the title of song F. The Tày transliteration of line 8 is '*Thanh khiết sự lẩu già giẳng kỉn*' (p.138), which is translated into French as "*Quand on est pur, le sacrifice de l'alcool et du thé sera parfait.*" (p.162) The relevant phrase is '*sự lẩu già*', literally 'the matter of wine and tea'. Wine and tea are frequently mentioned together in these lyrics, as on lines 21, 22, and 84, both as offerings to the ancestors and refreshments for the wedding guests. The meaning of *kin* at the end of the line is usually 'eat, drink, consume' (TNV 181) but the graph used seems anomalous. In any case the French translation is not a literal translation of the Tày.

The spelling *ché* for *chá* 茶 is also found, twice on line 98 and once on line 112. The Tày transliteration of line 98 is '*Ché là ché lặm đông khuổi lẩc*' (p.145), and the French translation is "*Ce thé vient de la forêt cachée et des sources profondes*." (p.166)

The pronunciation *già* has a voiced initial, with the *gi-* pronounced as in Vietnamese *Quốc ngữ* as a voiced alveolar fricative /z/. The pronunciation *ché*, on the other hand, has an unvoiced alveolar affricate initial. Distribution of the two different pronunciations would appear to be context-dependent, with *già* when embedded in the phrase *lẩu già* 'wine and tea' and *ché* as a stand-alone noun. It turns out though that *ché* is a borrowing from Vietnamese *chè* 'tea leaves', so there is a semantic difference, with *già* referring to tea as a beverage, and *chè* referring to tea leaves as plant material from which the beverage is made. A pronunciation of the latter with a different tone, *ché*, is listed in TDCNT p. 72.

Pre-modern readings of *chá* 茶 'tea' are EMC draɨ/drɛː and LMC trɦaː; the SV reading is *trà*. The SV reading is close to LMC, with an unvoiced initial, while *già* retains the voiced quality of the EMC initial. Interestingly, the final *-e* of *ché* corresponds to the final in EMC drɛː.

The graph *chá* 茶 'tea' is found twice in these lyrics used as a phonetic borrowing, for *giá* 'to finish' found on line 62 and for *giá* 'don't' found on line 274. These words are pronounced the same as *già* 'tea' except for a difference in tone. 'Don't' is also spelled *dá* in standard dictionaries of Tày, indicating the same pronunciation, and its usage is discussed in the grammar of Tày published in 1971 (*Ngữ pháp Tiếng Tày-Nùng* 1971:80). There are two entries for *dá* in TNV p. 89, the first one 1. *rồi, thôi*; 2. *hết, kết thúc* ('to finish, bring to a close') and the second one *chớ, đừng* ('don't'). These two entries give us a clue to the derivation of the prohibitive or negative use of *dá* from 'to finish', by a process of semantic extension. Li Fang-kuei reconstructs this word corresponding to Siamese jaa B1 with PT *ʔj- (HCT 9.9.2, p. 182); Pittayaporn's PT reconstruction is *ʰɲaːᴮ (item 784). This is an initial which tends to be pronounced in Tày as a voiced palatal approximant (cf. 'to be located', usually transcribed as *dú* in written Tày).[10]

[9] For SV a useful resource is Thiếu Chửu 2002.

[10] Holm, field recordings, Jinlongdong, Liuzhou county, Guangxi, March 2016.

Finally, *chá* 茶 is used as a graphic component in one vernacular compound character found in the text. This is the word for 'paternal grandmother' found in the title to Chant M and in line 293, transcribed as *giả*, and on line 302, transcribed as *yả*, in both cases written with a FEMALE radical *nǚ* 女 on the left and 茶 on the right, in left-right configuration (媃).[11] The word for 'paternal grandmother; mature woman' in Tai languages had a voiced initial at the PT stage. Li Fang-kuei reconstructs this word corresponding to Siamese jaa B2 with PT *j- (HCT 9.8.2). Li comments, "The details of its pronunciation in Tay and Tho are not known, although it is probably more fricative, somewhat like ž- ... Words with this initial have series 2 of the tones, indicating its original voiced quality." (p.178)

2. 哽 *giường* 'to report, petition'

This word is found multiple times in the wedding song lyrics, transcribed as *giường*, and transcribed as *trính* on lines 149 and 150.[12] The Tày transcription of line 17 reads, '*Khỏi giường mừa song thân quí họ*' (p.139), and the French translation is "*Je demande à exposer ceci aux deux parents de la noble famille*." (p.162) The French word corresponding to *giường* is '*exposer*'.

This word is written consistently in these lyrics with a MOUTH radical (口) on the left and 呈 *chéng* on the right; this is a vernacular variant of 呈 Modern Standard Chinese (MSC) *chéng* 'manifest, show; report, petition'. This in turn is a commonly used word in pre-modern Chinese administrative communication. Pre-modern readings are EMC driajŋ and LMC trɦiajŋ, and SV pronunciation is *trình*. The reading on lines 149–150 is clearly based on SV, while the much more frequent pronunciation *giường* has a voiced initial *gi-* corresponding to the voiced initial in EMC, with the initial voiced alveolar stop softened to /z-/.

3. 者 *giả* (pronoun substitute for head of a relative clause)

This word, common in Classical Chinese and also in modern Chinese, MSC *zhě*, is found once on line 142. The spelling with initial *gi-* indicates that it was pronounced with a voiced initial in this dialect of Tày. The Tày transcription of line 142 is '*Cuổn rièo lệ cổ giả mà thôi*' (p.148), and the French translation is "*Nous nous efforçons seulement de suivre l'antique tradition*." (p.168) The relevant phrase in Tày is *cổ giả*, literally 'ancient' plus *zhě* 'that which'. The preceding word *lệ*, Chinese *lì* 例, means 'example, precedent'. Thus the corresponding French rendering is '*l'antique tradition*'.

Pre-modern readings of *zhě* 者 include EMC tɕia´ and LMC tʂia', with SV *gỉa*. In this case, the voiced initial in the Tày pronunciation comes from SV.

4. 嫁 *giá* 'be married (of female)'

This word, MSC *jià*, is found on lines 44, 126, and 298. The Tày spelling *gi-* indicates a voiced initial. The Tày transcription of line 44 reads, '*Soong bưởng định hôn nhân giá xủ*' (p.140), and the French translation is "*Des deux côtés, nous avons fixé les rites du mariage*." (p.163) The relevant phrase here is *giá xủ*, written with 嫁娶, a combination of two morphemes meaning respectively 'to be married (of the female)' and 'to take a wife (of the male)'. This phrase in turn is appended adjectivally to *hôn nhân*, itself the SV pronunciation of the Chinese word *hūnyīn* 婚姻 'marriage'. The same phrase *giá xủ* is also found on line 126. Here the French phrase '*les rites du mariage*' corresponds to *hôn nhân giá xủ*.

Pre-modern readings of *jià* 嫁 include EMC kaɨʰ/kɛːiʰ and LMC kjaːˋ, while the SV pronunciation is *giá*. Here the voiced initial is based on SV. In the first two instances this word appears in the combination 嫁娶 *giá xủ*, so it belongs to the Sino-calque level.

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[11] Attentive Chinese-literate readers may notice that in this compound character, the *chá* 茶 component is written with two right and left-facing dots above a horizontal line, rather than a standard GRASS radical (艹), and the left-slanting and right-slanting strokes immediately underneath it replaced with what looks like *ér* 儿. This way of writing the character is common in Tày vernacular writing in northern Vietnam.

[12] It is found on lines 17, 18, 19, 29, 55, 73, 74, 75, 81, 93, 118, 146, 152, 175, 176, 194, 195, 197, 206, 214, 215, 218, 248, 269, and 293 (19 times).

5. 同 *đồng* 'the same'

This word, MSC *tóng* 'the same' is found twice in these lyrics, once on line 46 where it is transcribed as *đồng*, and once on line 164 where it is transcribed as *riồng*. In Nguyễn-văn-Huyên's transcription, initial *ri-* is employed to represent a voiced alveolar sibilant (z-), while barred d (đ) is used to represent an unvoiced pre-glottalised alveolar stop. The Tày transcription of line 46 reads, '*Khỏi là gần đồng chung soong bưởng*' (p.140), while the French translation is "*Je suis l'homme commun aux deux familles*." (p.163) The operative phrase is *đồng chung*, appended to the noun *gần* 'person' adjectivally. The second of these syllables *chung* is written with 終 MSC *zhōng* 'end, finish', but is to be identified as the Vietnamese word *chung* meaning 'in common' (YHCD p. 251).[13] The corresponding French word is '*commun*'.

The Tày transcription of line 164 reads, '*Nghĩ mà bấu riồng gần sắc ỷ*' (p.149), and the French translation reads, "*En réfléchissant bien, nous voyons que nous sommes loin de niveau des autres*." (p.168) Here *riồng* appears as a predicative adjective following *bấu* 'not'. So the Tày lyrics read, literally, 'not the same [as] other people in any sense'. The French translation conveys the general sense of the line but has a different structure, without an overt negative.

Pre-modern readings of *tóng* 同 include EMC dəwŋ and LMC tɦəwŋ; the SV pronunciation is *đồng*. The reading on line 46 is the same as SV, and the reading on line 164 is Tày, with *ri-* initial indicating a voiced initial.

6. 𠎁 *riởi* 'generation'

This word is written in these lyrics with a vernacular graph, with 世 *shì* 'generation, world' and 代 *dài* 'substitute, replace; generation' in vertical configuration, with one character on top of the other; the morpheme represented, however, is 代 MSC *dài* 'generation'. This word is found 7 times in these lyrics, on lines 76, 77, 78, 117, 244, 245, and 304. On line 76 the Tày transcription reads, '*Riởi xưa khẻo riắt giảo pi bươn*' (p.144), and the French translation is "*Autrefois on a habilement créé l'année et le mois*." (p.165) The relevant phrase is *riởi xưa* at the beginning of the line, composed of *riởi* and *xưa* 'of old, in ancient times', and the French translation is '*autrefois*'.

Pre-modern readings of *dài* 代 include EMC dəj' and LMC tɦaj`; the SV pronunciation is *đại*, and there is also what is probably an earlier Han loan in Vietnamese, *đời*.[14] The Tày reading here corresponds to EMC, with initial *ri-* representing a fricated alveolar voiced initial. We note that the vowel in *riởi* also reflects the final -əj in EMC, rather than the -aj final in LMC; likewise, the final *-ời* in Vietnamese *đời*.

7. 造 *giảo* 'construct, create, make'

This word, MSC *zào* 'construct, create, make', is found in these lyrics on lines 76 and 106. For the transcription and translation of line 76 see the above entry. In this line *zào* 造 appears as the second component in a bisyllabic verb compound, *riắt giảo*, where the first component *riắt*, written with *dá* 達 'extend to, reach to', means 'to establish, set in place'. Actually this compound verb is listed in TNV p. 441, under *tặt chảo*, with spelling that reflects the unvoiced initials of standardized Tày.

Pre-modern readings of *zào* 造 include EMC dzaw' and LMC tsɦaw`, and the SV pronunciation is *tạo*. The voiced initial *gi-* in the Tày pronunciation corresponds to the voiced initial dz- in EMC, with the softening of voiced d- to a voiced alveolar sibilant.

[13] The SV reading of *zhōng* 終 is *chung*, borrowed here phonetically for *chung* 'in common'.

[14] On this early layer of Han loans in Vietnamese see Mark Alves 2018. See also Wang Li 1948:770−793.

8. 陽 *rương* 'sunny side; south side of a hill'

This word, MSC *yáng*, is found on line 126, where the Tày transcription is '*Lễ giá xủ rương đông hôn hỉ*' (p.147), and the French translation is "*Les cérémonies du mariage sont joyeuse dans notre monde*." (p.167) The relevant phrase in Tày is *rương đông*, with *đông* attached adjectivally to *rương*, referring to the realm of light, i.e. the land of the living. *Rương đông* is a set phrase borrowed from Chinese *yángdōng* 陽東, referring to the land of the living as opposed to the land of the dead.[15] The corresponding phrase in the French translation is '*dans notre monde*'.

Pre-modern readings of *yáng* 陽 include EMC jiaŋ and LMC jiaŋ; the SV rendering is *dương*. Here the reading is closest to SV, with initial *d-* now pronounced /z/, but previously /y/. Note that the vowel *-ươ-* rather than *-a-* is also in correspondence with EMC.

9. 培 *vòi* 'earth up, cultivate, train'/ 'compensate'

This word, MSC *péi*, is found on line 138, where the Tày transcription is '*Công khỏ mỉn khôn xiết riền vòi*' (p.148), and the French translation is "*Il serait impossible de compenser cette peine*." (p.167) The relevant phrase is *riền vòi*, a disyllabic verb compound with *riền* meaning 'to fill in' and *vòi* meaning 'to compensate'. The corresponding word in the French translation is '*compenser*'. What is being referred to in this line is the pain and danger involved in the long months of pregnancy before the birth of a child.

The word *vòi* is written here with 培 MSC *péi* 'earth up, cultivate, train', pre-modern readings of which include EMC bəj and LMC pɦuaj; the SV reading is *bồi*. The relevant morpheme however is 賠 *péi* 'compensate', with the same EMC and LMC readings. This word is a Han loan with a voiced initial at the EMC stage, represented graphically by a homophonous character in the same graphic-phonetic series. With bilabial initials in this dialect of Tày the initial b- of EMC is softened to a bilabial voiced fricative, represented in the Tày transcription here by v-.[16]

10. 坦 *riền* 'fill in'

The first syllable in the disyllabic compound *riền vòi* found on line 138 is represented in the character text by a vernacular compound graph composed of an EARTH radical (*tử* 土) on the left and *tián* 田 'wet-field' on the right. For the location of this word in line 138 see the above entry. This vernacular compound graph represents a different Han loan, viz. *tián* 填 'to block up, fill in', by a process of phonetic borrowing. *Tián* 填 in turn has pre-modern readings including EMC dɛn and LMC tɦian, with *điền* as the SV pronunciation. We note the presence of a voiced alveolar stop initial in EMC, corresponding to a voiced alveolar fricative in Tày. The final would appear to follow SV spelling, except that we need to remind ourselves that in Nguyễn Văn Huyền's transcription *ri-* represents the voiced alveolar initial and *-ền* represents the final, meaning that the local Tày pronunciation was close to EMC dɛn.

11. 餘 *rư* 'remainder'

This word, MSC *yú* 'excess, surplus, remainder', is found on line 144, and the same graph is used on line 193 for *rầư* 'which?' The Tày transcription of line 144 is '*Lễ bất túc nhi kính hữu rư*' (p.148), and the French translation is "*Ces cadeaux ne sont pas suffisants, mais notre cœur respectueux est débordant*." (p.168) The relevant phrase is *hữu rư*, written as 有餘 MSC *yǒu yú*, lit. 'have remainder', a reasonably common phrase in Chinese. Here the phrase is transferred holus-bolus, with readings based on SV.

Pre-modern readings of *yú* 餘 include EMC jiă and LMC jiă/jyă; the SV reading is *dư*. Here the voiced initial comes from SV, with Nguyễn-văn-Huyền's *r-* instead of *d-* (both indicating a voiced alveolar sibilant).

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[15] The westerly direction, by contrast, is associated in Chinese culture with the *yīn* 隱 world of shadows and darkness, and with death.

[16] There is an element of approximation involved in this conventional rendering, given that v- usually represents a labiodental voiced sibilant rather than a bilabial.

12. 貞 *rình* 'genuine'

This word is found on line 207, where the Tày transcription is '*Tự Phục-Hy riắt oóc kẻ rình*' (p. 153), and the French translation is "*C'est bien Phục-Hy qui a institué ce rite*." (p.170) Here *rình*, along with the preceding *kẻ*, forms a sentence-final confirmational phrase (TDCNT 226–227). So in the French translation this word corresponds to '*bien*', rather than '*ce rite*'. In Chinese this word has the meanings 'loyal, upright; chaste; test, verify'. The last sub-meaning is the one relevant here.

This word has pre-modern readings including EMC triajŋ and LMC triajŋ; the SV pronunciation is *trinh*. The tone of this word in Tày here does not match that of the Chinese word, or SV. A homophonous VN word *rình* has a range of meanings 'to lurk, lie in wait; approach; extremely (smelly)', and is clearly a different morpheme. The reason for the difference in tone awaits further investigation. On the face of it, the romanized transcription here represents the substitution of a low-register tone for a high-register tone in the same proto-Tai tone category (PT tone A), and it is well established that voiced initials are related to low-register tones (Haudricourt 1958). In Tai poetics, conventional practice is to allow words in the same PT tone category (A, B, C, or D) to rhyme (Holm 2003:32−34).

13. 床 *giường* 'bed'

This word 床, MSC *chuáng* 'bed', is found on line 223 of the lyrics. The Tày transliteration of that line reads '*Pát giản tả giường nưa páy lạng*' (p.154), and the French translation reads "*Les bols et les assiettes abandonnés sur les lits ne sont pas encore lavés*." (p.171) The relevant phrase here is *giường nưa*, literally 'bed + upper', with *nưa* 'above' appended to *giường* adjectivally. The French translation omits this adjective. The preposition '*sur*' in the French translation is a separate addition, since in Tày the verb *tả* 'abandon' is followed directly by the location phrase.

This word has pre-modern readings EMC dʑiaŋ and LMC tʂʰaːŋ; the SV pronunciation is *sàng*.[17] This word has a voiced initial in EMC, and also a vowel which corresponds to EMC. The SV reading by contrast is based on LMC.

14. 養 *rưởng* 'feed, raise'

This word 養, MSC *yǎng* 'feed, raise up', is found on line 236 of the wedding song lyrics. The Tày transcription of this line is '*Sắng thuổn tằng vỏ mẻ rưởng sinh*' (p.155), and the French translation is "*Nous saluons les parents qui ont élevé [leur fille]*." (p.171) The relevant phrase here is *rưởng sinh*, written with 養生 MSC *yǎngshēng*. This is a common phrase in Chinese, where *shēng* 'live; alive, living' functions as a result in a resultative verb compound. Here, both syllables are pronounced in their SV fashion.

This word has pre-modern readings including EMC jɨaŋ' and LMC jiaŋˊ; the SV pronunciation is *dưởng*. The EMC vowel is reflected in the Tày reading; the voiced initial however is from SV.

15. 跬 *hái* 'shoes'

This word, 鞋 MSC *xié* 'shoes', is found on line 266 of these lyrics, written with a vernacular variant of the standard graph. Rather than having the LEATHER radical (*gé* 革) as the left-hand component, the graph here has a modified BEAN radical (*dòu* 豆) with the top horizontal stroke left off. This is actually a vernacular variant of the FOOT radical (*zú* 足), commonly found as a component in compound graphs both in northern Vietnam and in southern China.

The Tày transcription of line 266 reads '*Soong kha nủng hái hoa lồng lảng*' (p.156), and the French translation reads "*Que vos deux pieds chaussent ces souliers [brodés de] fleurs pour descendre de la maison!*" (p.172) The relevant phrase is *hái hoa* 'shoes' plus 'flower', and the French translation has "souliers [brodés de] fleurs". Here *hái* is probably a misprint for *hài*.

[17] The pronunciation *giường* is also found in Vietnamese (Mark Alves, personal communication, October 2024), so this word here could also be a borrowing from Vietnamese.

This word has pre-modern readings including EMC ɣaɨj / ɣɛːj and LMC xɦjaːj; the SV pronunciation is *hài*. This is a Han loan with *h*- in Tày transcription corresponding to the voiced initial ɣ-.[18] On this initial in PT see HCT 10.7 (discussion on p. 214). Zhang Junru et al. (1999) list this as item 482 in the Appendix. One of the Thổ dialects of eastern Yunnan that preserves voiced initials, Wen-Ma (Wenshan-Maguan), has a different morpheme listed (thɤɯ^{3} nɤɯ^{3}), but Qiubei, also in eastern Yunnan, another location which has preserved voiced initials, lists ɣaːi^{2}.[19] On the face of it, initial *h*- and SV correspond well with the LMC reading, with a long vowel [aː].

16. 地 *rỉ* 'earth, land, place'

This Han loan, MSC *dì*, is found just once, on line 290. The Tày transcription reads '*Vậu riồn pây khoóp quê mọi rỉ*' (p.158), and the French translation reads "*On répandra leur renom par toutes les campagnes et dans toutes les régions*." (p. 173) Corresponding to *rỉ* is the French '*les régions*'. The relevant phrase in Tày is *mọi rỉ*, 'each place', corresponding to French '*dans toutes les régions*'.

This word has pre-modern readings including EMC di^{h} and LMC tɦi`; the SV pronunciation is *địa*. The Tày reading here corresponds to EMC, with the voiced alveolar stop initial fricated and represented in the transcription here by *r*-. In Tày dictionaries this word is listed as *tỉ* (TNV 430).

17. 塘 *riàng* 'road'

This word is found with three different pronunciations in these wedding song lyrics. The most common is *riàng*, found six times, on lines 65, 83, 116, 256, 257, and 281. Next most common is *đường*, found three times, on lines 30, 85, and 228. Finally *tàng* is found just once, on line 288. In all cases these are written with the same character 塘, MSC *táng* 'dike, dam; pool, pond'. This morpheme comes to be used for the Tày word for 'road' because official roads in the Chinese empire were equipped with way-stations, which were called *táng* 塘 because they had to be equipped with a supply of drinking water for horses.[20] Hence this word came to be used very commonly in the Tai languages for 'road, way'.[21]

To take these various pronunciations *seriatim*, beginning with the most common one, the Tày transcription of line 65 reads '*Nhù quét lăng cuổn hoẻng hơn riàng*' (p.142), and the French translation reads "*Le balai, pourquoi l'as-tu jeté au milieu du chemin?*" (p.164) The word *riàng* here is found at the end of the line after *hơn* 'over', corresponding to the French '*au milieu du chemin*'.

The Tày transcription for line 30 reads '*Khỏi giạ mừa khéc lạ đường xa*' (p.140), and the French translation reads "*Nous saluons les visiteurs qui viennent de loin*." (p.163) The relevant phrase here is *đường xa*, with *xa* meaning 'distant', a Vietnamese borrowing. Part of the same meaning is conveyed in the phrase *khéc lạ* 'guests who are unfamiliar' (*lạ* also being a borrowing from Vietnamese).

For line 288 the Tày transcription reads '*Kin giá lại xa tàng công viểc*' (p.157), and the French translation is "*Après le repas, ils poursuivront leur travail*." (p.173) Here *công viểc* 'work', a Vietnamese borrowing, is attached adjectivally to *tàng* 'road'. A direct equivalent of the noun *tàng* does not appear in the French translation. It may be worth noting that *tàng* is used here metaphorically, as 'road, way'. Incidentally, *tàng* is the rendering of this morpheme in Tày dictionaries (e.g. TNV 402, glossed in Vietnamese as *đường*).

This word has pre-modern readings that include EMC daŋ and LMC tɦaŋ; the SV pronunciation is *đường*.

In the majority of locations in this text, this word is read with a voiced initial *ri*-, pronounced as /z-/, an alveolar voiced fricative. At one location, line 288, it is read with the corresponding unvoiced

[18] Other words with this initial, such as 'water buffalo', are listed in Zhang Junru et al., 1999 with an initial ɣ- in IPA (item 112, p. 611). The Tày transcription used in Vietnam represents this initial by *h*-. The quality of this initial is a matter that needs to be confirmed by on-site fieldwork.

[19] Zhang Junru et al., 1999, p. 665.

[20] Roads were a vital part of the infrastructure of the Chinese empire. The *táng* 塘 were part of a system called the *tángxùn* 塘汛 system, consolidated during the Qing dynasty (1644–1911): see the chapter on Foodstuffs and Commodities in the Draft History of the Qing (*Qing shi gao: Shihuo zhi* 清史稿:食貨志). For details on the construction of military roads in the far south of China in earlier times, see Holm 2010:18–21.

[21] See HCT 6.3.11. Li includes this in his reconstruction of PT *d-, but in fact it is a Han loan-word.

initial. In three places the reading corresponds directly to SV. However, because the usual Vietnamese word for 'road' is also *đường*, these instances should be considered direct Vietnamese borrowings rather than SV readings, especially since the relevant phrases are in Vietnamese. We find on lines 85 and 228 that *đường* is embedded in the phrase *đường xa*. The next thing to check would be how *xa* is represented graphically in CNV: it turns out that the character used for *xa* in these wedding songs (賒, MSC *shē*) is also documented in CNV (TDCNDQ p. 2112). We can be confident therefore that *đường* in these lyrics represents a Vietnamese loan-word, especially as 塘 is also found as a graphic representation of *đường* (TDCNDQ p. 614).

5 Tally

In the above examples we find:

Table 1. *Readings of Han Chinese Loanwords in the Cao Bằng Marriage Songs*

No.	Item and no. of appearances	EMC	LMC	SV	Vietnamese
1	'tea' (x8)	5			3
2	'report' (x21)	19		2	
3	(that which) (x1)			1	
4	'be married' (x3)			3	
5	'the same' (x2)	1		1	
6	'generation' (x7)	7			
7	'construct' (x2)	2			
8	'sunny side' (x1)			1	
9	'compensate' (x1)	1			
10	'fill in' (x1)	0.5		0.5	
11	'remainder' (x1)			1	
12	'genuine' (x1)	0.5		0.5	
13	'bed' (x1)	0.5			0.5
14	'feed' (x1)	1			
15	'shoes' (x1)			1	
16	'earth' (x1)	1			
17	'road' (x10)	6	1		3
	Totals	44.5	1	11	6.5

There are two items in the above table (10 and 12) for which the assignment of reading affiliation is split between EMC and SV. In one of these cases the final clearly follows SV but the initial is a voiced initial corresponding to a voiced initial in EMC. In the other case the initial follows EMC but the final follows SV. There is another item (13) split between EMC and Vietnamese, given that either is equally possible.

The above totals are based on the numbers of instances appearing in the text, and provide a picture of the overall impact of voiced initials. It would also be instructive to simply count the number out of a total of 17 items with voiced initials that have each kind of affiliation. Thus, there are 11 words with EMC readings (counting the 0.5 instances as 0.5 each), 1 with a LMC reading, 8 with SV readings, and 2 or 3 Vietnamese loan-words.[22] If we put the VN loan-words to one side, then the same totals would be out of a total of 14. Thus for this particular text, the EMC matches total just under 65%, while the SV matches are 47% (or, out of 14, over 78 % and 57%).

[22] These numbers for each type, when added up, exceed a total of 17 because some words with more than one reading are counted twice or three times.

6 Discussion

It is well established in the history of the Chinese language that voiced initials were still present in the language at the time of Early Middle Chinese, conventionally dated to 601 CE and the promulgation of the *Qieyun* 切韵, but died out or were transformed into a different system of initials and tones by the Late Middle Chinese period, which is usually said to have been more or less complete by the end of the Tang period.[23] This is the broad-brush picture, of course, and it is well known that some southern dialects, e.g. Shanghainese, have retained voiced initials to this day.

What we can say definitively is that many of the readings presented here correspond to EMC, and not to LMC or any subsequent stages in the development of Chinese, including Chinese dialects found in the region (Pinghua, Cantonese and so on).[24] The relationship with Vietnamese and Chữ Nôm readings is more complex and is well worth exploring, though it is worth noting that the intensification of Vietnamese presence in the Cao Bằng area dates only from the late 17th century, after the fall of the Mạc dynasty (Holm 2020b:208). Even so, we note that voiced initials based on SV readings are the second largest category in these readings.

Whether we can proceed on the basis of this 'correspondence' with EMC to assign an early historical date for the origin of these readings is a more complicated question. The evidence presented here has been confined to Han loanwords, and would need to be augmented with a more extensive study of the entire range of proto-Tai voiced initials in Tày manuscripts from the area. Until this has been done, and the exact contours of the EMC voiced initial correspondences have been delineated, there is ample reason for caution. Nevertheless, it is also appropriate to speculate that characters with voiced initials were chosen long ago to represent Tày words with voiced initials. The presence of Chinese loan-words with original voiced initials retaining those voiced initials in present-day Tày speech in the Trùng Khánh area suggests that this is not an unreasonable proposition. Moreover, and this is a most important point − the use of some of these characters as phonetic components in compound graphs used to represent other words that also had voiced initials in Tày is evidence that voiced initials were perceptually salient among local scribes.[25]

Does such an early date fit in with what is known about the history of the area? Hoàng Triều Ân has cited evidence from local historical records to indicate that well-connected families in the Cao Bằng area were engaged in studying for the Chinese civil service examinations from the 4th or 5th centuries onwards.[26] This, again, would need to be confirmed, but it gives one reason to hypothesize that the whole area, along with the Red River delta region, had become a hive of literate culture from an early age. What is well-established, of course, is that the Red River region became a well-developed center for Buddhist and brahmanical learning in the early centuries CE, rivalling the northern capital Luoyang in the size and number of its temples (Holm 2018:14−17). We know also that some of the population in the Red River plains, as well as in the valleys further north, was Tai-speaking.[27] Against this background, the presence of so many traces of voiced initials in the Tày vernacular script starts to make more sense.

Abbreviations

CBMS	Cao Bang Marriage Songs (in Nguyễn-văn-Huyền 1941)
CNV	Chữ Nôm Việt
EMC	Early Middle Chinese

[23] On which see Pulleyblank 1984. As is well known, SV readings are based primarily on LMC.

[24] On Pinghua see Li Lianjin 2000. Cantonese was a fairly late addition to the dialect mix in Guangxi, dating largely to the 18th century (Holm 2013:44), and was also unlikely to have spread as far as northern Vietnam in the pre-modern period. On Pinghua readings, see Holm 2013:40−42.

[25] Other examples of this are found in Holm 2023, as well as an analysis of the full range of proto-Tai initials in the 'Crossing the Seas' manuscript from the same district.

[26] Hoàng Triều Ân, 'Bước đầu Khảo cứu Chữ Nôm Tày', pp. 632–633.

[27] Among Tày people living in northern provinces, some report that their ancestors came from further south (Holm, fieldwork, Cao Bằng, Thái Nguyên, and Lạng Sơn, 2015–2017). The Tày people in the northern part of Longzhou county in Guangxi reported that their ancestors came originally from Hải Dương province in the Red River Delta some 14 generations previously (around 600 years ago). See Holm 2020a:150.

HCT	Li Fang-kuei, *Handbook of Comparative Tai*
LMC	Late Middle Chinese
MSC	Modern Standard Chinese
PT	Proto-Tai
SV	Sino-Vietnamese (Hán-Việt)
TNV	Hoàng Văn Ma et al. (1974)
TĐCNDG	Nguyễn Quang Hồng (2014)
TDCNT	Hoàng Triều Ân, *Từ Điển Chữ Nôm Tày* (2003)
VN	Vietnamese
YHCD	*Yue-Han cidian*

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LINGUISTIC ARCHAEOLOGICAL INSIGHTS INTO THE LIVELIHOOD PATTERNS OF THE PROTO-AUSTRO-TAI SPEAKING POPULATION

Yu JIAN
Austronesian Research Institute of Fujian University of Technology，Xiamen University
10620210156695@stu.xmu.edu.cn

Abstract
Based on archaeological observations of the indigenous livelihood patterns along the coast of southern China during the Neolithic period, this paper combines cognates of Kra-Dai and Austronesian with the remains of prehistoric shell middens in southern China for linguistic archaeological analysis, aiming to explore the livelihood patterns of the proto-Austro-Tai-speaking population. The main claims are (1) the livelihood patterns of the proto-Austro-Tai-speaking population were primarily focused on fishing, hunting, and gathering in addition to tuberous agriculture and trade and (2) before the Austronesian population migrated to Taiwan, the proto-Austro-Tai population lived in the coastal areas of southern China during the Neolithic Age.

Keywords: Proto-Austro-Tai, Kra-Dai, Austronesian, livelihood patterns, linguistic archaeology
ISO 639-3 codes: swi, kmc, xsy, pwn, pzh, ssf, ilo, kzi, doc, giu, mmd, yha, pcc, zha, tct, lic, lbc, byq, bzg, fos, bnn, tha, tys, skb, onb, lbt, laq, ami, ckv, kpm

1 Introduction

Proto-Austro-Tai (hereafter, PAT) is a linguistic macro-family hypothesis which was first proposed by Benedict (1942). This hypothesis holds that Kra-Dai (KD) and Austronesian (AN), the two major language phylums in southern East Asia and the Pacific, are descendants of a common language. However, due to serious methodological problems in Benedict's follow-up publications on the hypothesis (Benedict 1975, 1990), the Austro-Tai hypothesis itself has not been widely accepted.[1] Since then, Ostapirat (2005, 2013, 2018), Norquest (2013), and Smith (2022) have made historical comparisons of the cognates in AN and KD and found that there are regular phonological correspondence rules between the two language phylums. This implies that KD and AN can be traced back to a common ancestor. In addition, with the development of paleogenomic technology in recent years, population genetics has begun to add additional insight into the origin of Austronesian (Wang, C.C. et al. 2021), and through interdisciplinary cooperation with archeology (Guo et al. 2023) and linguistics (Fan et al. 2018), the view that KD and AN has a genetic relationship has gradually been widely accepted.

Based on the above multidisciplinary research, the current research explores the livelihood patterns of the PAT-speaking population. In previous studies, this issue could only be explored archaeologically based on shell mound sites along the coast of South China (Chang 1987). Due to the inability of archaeological culture to be directly related to a language population, the conclusions drawn are often

1 Benedict's subsequent works (after 1942) suffer from two serious methodological issues: (1) attempting to expand the Austro-Thai by incorporating Hmong-Mien (Benedict 1975) and Japonic (Benedict 1990). These two expansions provided him with almost infinite sources when searching for vocabulary with similar forms and meanings. Thus, the inclusion of these two language families did not receive widespread support; (2) directly comparing KD lexemes with both individual languages in AN and with late-stage proto-forms that contain innovated phonemes not present in PAN. Both of these approaches depart from historical comparative methodology, leading to significant skepticism within the historical comparative linguistics community regarding the PAT hypothesis.

limited to "Neolithic South China indigenous people" and cannot be further linked to a specific language population. Szabo & O'Connor (2004) criticized the interdisciplinary collaboration regarding Austronesian archeology and linguistics for lacking rigorous comparative analysis and verification when linking archaeological remains with language.

In view of this, based on archaeological observations of the livelihood patterns of indigenous people in the coastal areas of South China during the Neolithic, the archaeological remains of shell mound sites in South China are linked to KD and AN etyma and formally associating these sites with PAT- speaking people. Section 2 of this paper reviews the archaeological observations on the livelihood patterns of the people in the southeastern coastal of China during the Neolithic. Section 3 describes the methods and materials used in this article. Section 4 discusses the livelihood patterns of the PAT people based on linguistic archaeology. Section 5 summarizes the linguistic evidence on the livelihood patterns of the PAT population. The cross-correlation of linguistic and archaeological evidence shows that fishing, hunting and gathering, tuber agriculture and trade were the livelihood modes of the PAT people.

2 Archaeological observations on the livelihood patterns of indigenous people in coastal South China during the Neolithic

The livelihood patterns or livelihood economy refer to the economic behavior of human beings to obtain basic survival resources in order to maintain their survival needs (Wang 2011). Archaeological research shows that the Neolithic indigenous people in South China and its adjacent areas were particularly dependent on aquatic food and lived a life of gathering, fishing and hunting (Zhang and Hong 2008) and were described as a "rich food gathering culture" (Chang 1987). Archaeological fieldwork and zooarchaeological analyses in the Southeast Asian islands and Oceania over the past three decades also indicate that early Austronesian people's fishing ranges were mainly concentrated in offshore ecosystems (Ono 2010). This means that the Austronesian people retained the livelihood patterns of the PAT society for a long time after leaving the coast of South China. Comprehensive archaeological research into the origin of agriculture in China suggests the presence of agriculture characterized by the cultivation of tuberous root crops such as taro and yams in the coastal regions of southern China around the sixth millennium BCE (Zhao 2019, Chang 1981). During the late and final period of the Neolithic Age from 6,000~5,000 BP to 4,000~3,000 BP, the South China coast gradually introduced rice farming culture from the middle and lower reaches of the Yangtze River in the north (Zhang, C. and Hong X.C. 2009). In addition, the research on prehistoric stone tools on both sides of the Taiwan Strait and the Penghu Islands has shown that there was a cross-strait trade system with the Penghu Islands as a relay station 4,300 to 5,000 years ago (Guo et al. 2005). Solheim (2000) also proposed the concept of the Nusantao Maritime Trade and Communication Network based on the study of pottery characteristics in coastal South China, Taiwan, and northern Vietnam, and further believed that Austronesian was a trade language.

Based on the above archaeological claims, the coastal indigenous people of South China in Neolithic had three livelihood patterns: (1) fishing, hunting and gathering, (2) tuberous farming and (3) trade. However, are the Neolithic South China coastal aborigines with the above three livelihood patterns and the ancestral of KD and AN (or PAT-Speaking population) the same population? Linguistic evidence of the PAT population livelihood patterns is the key to answering this question.

3 Methods and materials

3.1 Method: Linguistic Archeology

Pan (2007) proposed the idea of establishing linguistic archeology, which comes from Linguistic Paleontology. Linguistic archeology includes both biological and non-biological aspects and pays special attention to the correspondence between linguistic evidence and archaeological remains. Linguistic archeology studies ancient human society and culture through the historical phenomena of language and calls ancient language forms surviving in modern languages "language fossils". In this framework, these language fossils have the same archaeological value as archaeological cultural sites, unearthed artifacts, and ancient human remains. In fact, Deng (1992:110) has already elaborated on the

idea of "linguistic archeology": "Core etymologies are the oldest basic core words (equivalent to "language fossils") in different languages ⋯ it is not only the basis for judging whether there is a genetic relationship between languages, but also a window to understand the prehistory and cultural of the people who speak this language". In other words, we can observe the living environment, geographical area, tools, religious beliefs and other early cultural characteristics of prehistoric residents by language fossils, or core proto-language reconstructions. In summary, the essence of linguistic archeology is the connection between historical comparative linguistics and archaeological culture.

3.2 Material

The supporting evidence used in this paper comes from linguistics and archaeology. The linguistic data include KD and AN cognates, and the archaeological data consist of remains of shell mound sites along the coast of South China during the Neolithic.

3.2.1 KD and AN cognates[2]

Smith (2022) has evaluated the KD and AN cognates proposed by Ostapirat (2005, 2013) and Benedict (1942), combined with his newly discovered KD and AN cognates and formed a list of 71 potential KD and AN cognates. We regard this list as the most reliable material for studying Kra-Dai and Austronesian cognates and constitutes the main source of KD and AN cognates in this paper. Additional KD and AN cognates in this paper are proposed.

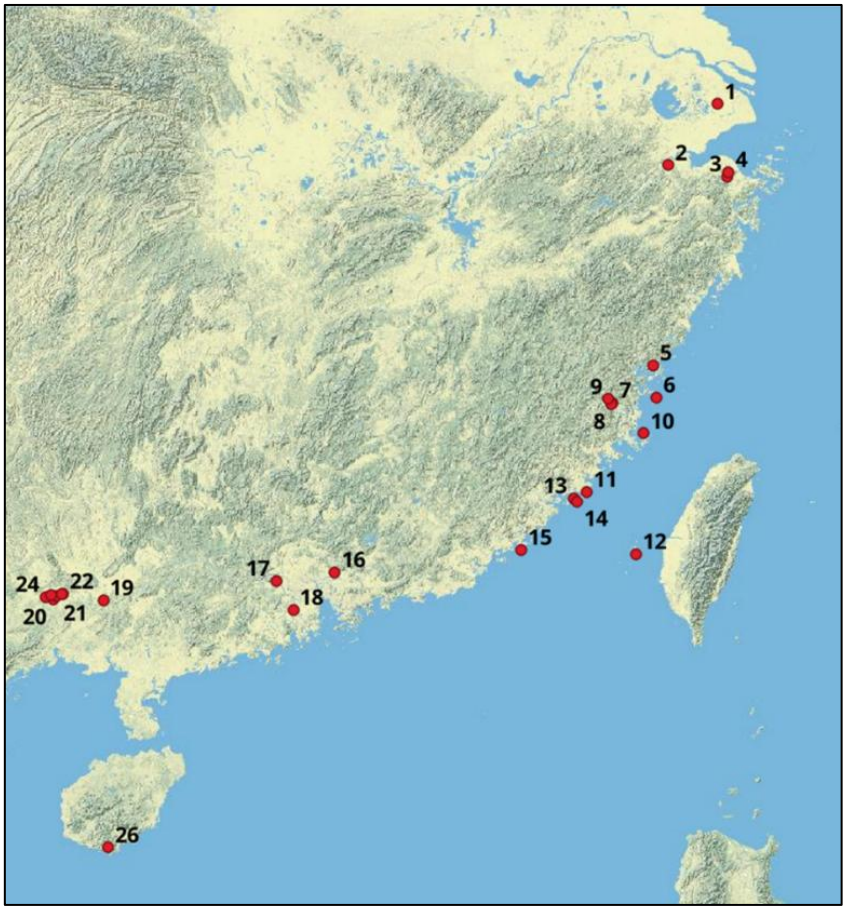
3.2.2 Remains of shell mound sites along the coast of South China[3]

Shell mound sites refer to a type of archaeological site containing accumulations of shells. The shell mound sites contain natural relics such as animal remains and plant remains related to human activities, as well as artificial relics such as implements for fishing, hunting, and agricultural, which are key in investigating the livelihood patterns of ancient people. The shell mound sites along the coast of South China covered in this paper and their geographical distribution and chronology information are shown in Figure 1. The archaeological ages of the above shell mound sites fall between 10,000 and 3,000 BP, which is compatible with the hypothesized time depth of the Kra-Dai, Austronesian and Austro-Tai. Based on the Bayesian phylogenetic method, the age of PAN can be traced back more than 5,000 years (Gray et al. 2009), and the differentiation time of PKD is around 4,000 years ago (Tao et al. 2023). The Bayesian dating of PAT by Smith & Yu (2024) shows that the common ancestor of KD and AN can be traced back to about 7,000 years ago.

2 Language Data Sources and Abbreviations are as follows: Proto-Austronesian (PAN) and Proto-Malayo-Polynesian (PMP), are from Blust, Trussel and Smith (2023), Proto-Kra (PK) are from Ostapirat (2000), Proto-Hlai (PH) are from Norquest (2007), Proto-Ong-Be (POB) are come from Chen (2018), Proto-Kam-Sui (PKS) are from Ilya Peiros (manuscript, starlingdb.org/kamset.pdf), Proto-Tai (PT) are from Pittayaporn, (2009), and Proto-Kra-Dai (PKD) are from Ostapirat (2018).

3 Data sources of 26 shell midden sites are listed after the References.

Figure 1: *The geographical distribution of the shell mound sites along the coast of South China*



1. Shanghai Songze (5800 – 5300 BP)
2. Zhejiang Kuahuqiao (8000 – 7000 BP)
3. Yuyao Hemudu (7000 – 5300 BP)
4. Yuyao Jingtoushan (8300 – 7800 BP)
5. Xiapu Huangguashan (4300 – 3500 BP)
6. Lianjiang Liangdao (8300 – 5300 BP)
7. Minhou Tanshishan (5000 – 4300 BP)
8. Minhou Zhuangbianshan (Late Neolithic)
9. Minhou Xitou (5500 – 3000 BP)
10. Pingtan Keqiutou (6500 – 5500 BP)
11. Jinjiang Anshan (Late Neolithic -3000BP)
12. Penghu Suogang (4500 – 3500 BP)
13. Kinmen Jinguishan (6400 – 3400 BP)
14. Kinmen Fugundun (6300 – 5500 BP)
15. Dongshan Damaoshan (5000 – 4300 BP)
16. Zengcheng Jinlan Temple (4000 – 3500 BP)
17. Gaoyao Maogang (3800 – 3500 BP)
18. Xinhui Luoshanzui (4000 BP)
19. Hengxian Jiangkou (Middle Neolithic)
20. Yongning Dingsishan (8000 – 7000 BP)
21. Yongning Niulanshi (Neolithic)
22. Yongning Tianwo (Neolithic)
23. Yongning Lingwu (10000 – 6000 BP)
24. Nanning Baozitou (8000 – 7000 BP)
25. Nanning Huiyaotian (7000 BP)
26. Sanya Luobidong (10890±100 BP)

The above linguistic and archaeological data, KD and AN cognates and remains of shell mound sites along the coast of South China are analyzed below to make claims the livelihood patterns of the PAT people.

4 Linguistic archaeological analysis of the livelihood patterns of PAT-speaking population

If the PAT-speaking people (or KD and AN ancestors) are indeed Neolithic indigenous people in the coastal areas of South China who relied on fishing, hunting, gathering, tuberous farming and trade as their livelihoods, then in linguistic archeology there must be 'language fossils' that reflect these practices. In view of this, the archaeological remnants from the shell mound sites along the coast of

South China are linked with KD and AN cognates to explore the livelihood patterns of the PAT-speaking population.

4.1 KD and AN cognates and shell mound sites by river and sea

Shell mound sites are mainly distributed in coastal and river areas (Figure.1), and rivers and seas are also important places for fishing and hunting. Although 'river' and 'sea' are not cognates between KD and AN, they have cognates of 'water', 'flow' and 'stream, current' as in examples 1 to 3.

1 'water' PAN *daNum, PH *nam^{C}, POB *nam^{C2}, PKS R-nam^{C}, PT *Ç.nam^{C}
2 'flow' PAN *qaluR, PK *lui^{A}, POB *lə:j^{A1}, PT *^{h}lwaj^{A}, Sui *lui^{1}*, S.Kam *hui^{1}*
3 'stream, current' PMP *qaRus, PKS*kru(:)i^{C}, PT *qrwɤj^{C}

PAN *daNum is related to 'fresh water' specifically, and it may not be a good example of coastal society. However, PAN *tenem 'sea, ocean', which is phonetically similar and semantically related to *daNum, is considered by Norquest (2013) to be a cognate of KD 'water'. Therefore, we retain 'water' as a KD and AN cognate referring to coastal livelihood locations.

4.2 KD and AN cognates and shell mound animal remains

The large number of shells in the shell mound sites makes the soil environment alkaline, which is beneficial to the preservation of animal remains in the site. Animal remains unearthed from shell mound sites along the coast of South China can be divided into mollusks, fish, reptiles, arthropods, birds and mammals. These six types of animal remains all have matching 'language fossils' in KD and AN etymologies.

4.2.1 Molluscs and 'snail, clam'

Molluscs mainly refer to shellfish, which are divided into bivalve shellfish such as clams and oysters and gastropod shellfish such as snails, which have been unearthed in large quantities in every South China shell mound archaeological site. In Austronesian, Blust (2002) reconstructed PWMP 'snail, clam' *kuhul. Without the support of Formosa evidence, this root cannot be constructed to the PAN level. But Ostapirat (2005) combined *kuhul with the evidence of KD (Tai *hɔɔi, Kam-sui *khuj, Hlai *tshei, and Kra *ci, 'snail, clam'), considered the *S >*h sound change that occurs between PAN and PMP, and reconstructed it as PAN*kuSul, see example 4.

4 PAN *kuSul, PWMP *kuhul 'edible snail sp'
PK *tʃui^{A} 'shell', PH *tɕ^{h}i: 'snail', POB *hoj^{A1} 'shell', PKS *khu:i^{A} 'snail, shell', PT *ho:j^{A}, 'shell'.

4.2.2 Fish and 'fish, fish scales'

Fish bones have been found in all shell mound sites that are considered in this study. One type is freshwater fish such as carp and catfish, and the other type is migratory fish such as mullet, perch, and sea bream. Whales, sharks and other larger marine animals have also been found at the Keqiutou (殼丘頭) site in Pingtan (平潭). Assuming that fish was an important source of aquatic meat for the PAT-speaking people, then there should be etyma for 'fish' in KD and AN. However, 'fish' does not have cognates in KD and AN, as shown in example 5.

5 'fish' PAN *Sikan, PK *p-la^{A}, PH *hla:, POB *ɓa:^{A1}, PT *pla:^{A}

Zorc (1994) pointed out that the literal meaning of PAN *Si-kan 'fish'' is 'used to eat', *kan means 'eat', and the affix *Si- is the object mark (Blust 2015). So, PAN *Sikan 'fish' is a lexical innovation after the split of KD and AN because the stem part *kan of *Sikan is still a KD and AN etymon. Examples are listed in 6.

6 ‘to eat’ PAN *kaen, PK *kan^{A}, PH *kʰən, POB *kən^{A1}, PKS *kɨa:n^{A}, PT *kɯŋ^{A}

Ostapirat (2018) constructed ‘fish’ in PKD as *bala:, which is suspected to be cognate with Proto-South Sulawesi (PSS) *bale ‘fish’. However, the correspondence between the final syllable vowels *e: and *a: is irregular. *-e of PSS comes from PAN *-ay (Mills 1975: 257), as in ‘to die’, PSS *mate < PAN *matay. If this root had existed in PAN, it should be PSS *bale < PAN *balay, but the correspondence between PAN *-ay and PKD *a: is still unacceptable. PKD *a:j is expected, such as PAN *matay and PKD *maTa:j (Ostapirat 2018). We should note that PKD *bala: constructed by Ostapirat (2018) did not combine Kam-Sui *mplaiC ‘fish’, which corresponds to PKD*-a:j and PAN*-ay. Therefore, *bala: in PKD should be revised to *bala:j, and the ‘fish’ in KD and AN can be compared temporarily as PAN *balay vs PKD *bala:j.

The above analysis is intended to show that the forms for ‘fish’ were cognates in KD and AN, but with the split between KD and AN, the innovation *Sikan*Sikaʔen of PAN replaced *balay. Since *bale only exists sporadically in South Sulawesi, which is very far away from the coast of South China, it is difficult to rule out that the PSS innovation or accidental similarity. In addition, it is difficult to explain the sound change conditions for PKD*-a:y to delete *-y in KD other than Kam-sui. While determining whether there are cognates for ‘fish’ in KD and AN requires further research, the word ‘fish scale’ is a conclusive cognate in KD and AN. Examples are presented in 7.

7 ‘fish scale’ PAN *quSeNap
PH *C-lə:p (Norquest, 2007:413), Kra (Li, 1992:112-113) Baha *tsa:p^{31}*, Yalang *kjap^{33}* Langjia *tsap^{54}*, Tai (Wang, 1984:808) Wuming *kjap^{7}*, Bouyei *tɛap^{7}*

In addition, there is another root for ‘fish scale’ in KD, which is cognate with AN ‘animal skin and leather’, as shown in example 8. Fish scale is a type of animal skin, which can be regarded as the result of the narrowing of the semantic scope of the word ‘skin’ in KD.

8 PAN *qaNiC ‘animal skin and leather’, POB *liʔ^{D1}, PKS *k[l]at, PT *klec^{C} ‘fish scale’

The final of POB *liʔ^{D1} and PTai *klec^{D} is not the expected *-t. This is because *-t has undergone a sound change of *-t > k in Tai. Pittayaporn (2009:211) reconstructed *-c for PT, and POB*-ʔ corresponds to PTai*-c (Chen, Y. L. 2018:115). Consider the following comparative data.

	Siamese	**Saek**	**PTai**	**Be**	**POB**
‘fish scale’	klet^{D1}	tlɛk^{D1}	*klec^{D}	liʔ^{D1}	*liʔ^{D1}
‘ant’	mot^{D2}	mɛk^{D2}	*mɤc^{D}	muʔ^{D2}	*mu:ʔ^{D2}

4.2.3 Reptiles and ‘soft-shell turtles’.

Common reptiles found in shell mound sites along the coast of South China are turtles and water tortoises, which are found in Pingtan Keqiutou (平潭殼丘頭), Lianjiang Liangdao（連江亮島), Jinjiang Anshan（晉江庵山), Zengcheng Jinlan Temple（增城金蘭寺), Xinhui Luoshanzui（新會羅山嘴), Gaoyao Maogang（高要茅崗）and most shell mound sites in Guangxi. A sword made of turtle carapace was also unearthed from the Hengxian Qiujiang（横縣秋江）shell mound site (Guangxi Zhuang Autonomous Region Cultural Relics Team 2005:114-187), and sea turtle remains were even unearthed from the Pingtan Keqiutou (平潭殼丘頭). Research shows that the Austronesian people discovered uninhabited islands in the Pacific and Indian Ocean by tracking the cross-oceanic migration of sea turtles (Wilme 2016), but there is no cognate for ‘sea turtle’ in KD and AN. Another root of PAN *qaCipa ‘soft-shelled turtle’ has been posited to be cognate with KD (Chamberlain 2021), as shown in example 9.

9 PAN *qaCipa ‘soft-shelled turtle’
PT *^{h}wɯə^{A}, Kam-sui Then *fjaa*^{35} Sui *fia*^{1}, Hlai Baisha *faa*$^{33(A)}$ ‘water tortoise’

Although *qaCipa can be reconstructed to the PAN level, it is only sporadically distributed in two Formosan languages, Atayal *qesipa* and Thao *qcipa*, and three WMP languages, Pangasinan *ansipa*, Kapampangan *antipa*, and Simalungun Batak *antipa*. Another PAN reconstruction, *peñu ‘sea turtle’, is widely attested among AN languages. The reason for this situation is that water tortoises or soft-shelled turtles are freshwater aquatic reptiles. After the Austronesian people left the coast of South China, they came into contact more with sea turtles than soft-shell turtles.

4.2.4 Arthropods and ‘shrimp’
Arthropod remains in shell mound sites along the coast of South China mainly include various crabs, hermit crabs and shrimp. They have been found in the ruins of Yongning dingshishan（邕寧頂獅山), Yongning Niulanshi（邕寧牛欄石), Yongning Tianwo（邕寧天窩), Nanning Baozitou（南寧豹子頭), Nanning Huiyaotian（南寧灰窯田）and other sites. Shrimp and crabs are usually harvested during fishing or gathering shellfish. ‘Crab’ does not have cognates in KD and AN, but ‘shrimp’ in KD and AN have cognates, as shown in example 10.

10 ‘shrimp’ PAN *qudaŋ
PH *ura:ŋ, POB *zuaŋ^{A2}, PT *kuŋ$^{B/C}$, KS Mulao *tjoŋ*^{6}, Maonan *kuŋ*^{5}, S. Kam *ʈoŋ*^{33}, Lakkja *tsoŋ*^{24}.

4.2.5 Birds and ‘bird’
Bird (poultry) bone remains are found in Jinmen Jinguishan（金門金龜山), Fuguodun (富國墩), Penghu Suogang（澎湖鎖港), Jinjiang Anshan (晉江庵山), Yongning Dingshishan (邕寧頂獅山), Yongning Lingwu (邕寧凌屋), Yongning Niulanshi (邕寧牛欄石), Yongning Tianwo (邕寧天窩), and other sites. Linguistically, KD and AN retain the cognate word for ‘bird’ as shown in example 11.

11 PAN *maNuk ‘chicken, bird’, PMP *manuk ‘chicken’.
PK *ŋok^{D}, PKS *m-nok*mluk, POB *nuk^{D2}, PT *Ç.nok^{D} ‘bird’

Blust (2002) constructed *manuk to the PMP level without Formosan reflexes, and the semantic construction was ‘chicken’, but the semantics in a large number of MP languages is ‘bird’. With the addition of Formosan data, such as Basay *manuk* ‘bird’, this root was constructed as PAN *manuk in the *Austronesian Comparative Dictionary*. Ostapirat (2005) combined with the reflexes of KD , such as Lakkja *mlok,* and reconstructed it as PAN *maNuk.

4.2.6 Mammals and ‘deer’, ‘large Ruminant’, ‘bear’, ‘otter’
The number of mammal remains is usually the largest category except shellfish in shell mound sites, and the species is diverse. Common mammals are deer, such as sambar, sika deer, muntjac, and barking deer, which appear in all south China coastal shell mound sites. ‘deer’ in Tai and the word ‘buffalo’ in PAN are obviously related. Although ‘deer’ and ‘buffalo’ are two different animals, they are both large ruminants, and some of the ‘deer’ in Formosa have the same name as the ‘cow, buffalo’. Examples are listed in 12.

12 PAN *qaNuaŋ ‘large ruminant species: carabao, water buffalo’, Thao *qnú:wan* ‘deer, carabao’, Siraya *luaŋ* ‘large animal’, Bunun *qanvaŋ* ‘deer, cow’, Pazeh *núaŋ* ‘buffalo’
PT *kwɯəŋ^{A} ‘deer’, Siamese *kwa:ŋ*^{A1}, Sapa *kwa:ŋ*^{A1}, Lungchow *kwa:ŋ*^{A1}, Saek *vuəŋ*^{A2}

However, it is unexpected that the *N of PAN *qaNuaŋ would be deleted in PT *kwɯəŋ^{A}. Therefore, it is not yet clear whether these word forms are cognates or loanwords. Regardless, these words at least reflect the PAT population's use of ruminants such as ‘buffalo’ or ‘deer’.

Bear remains are distributed over a wide range and have been found in shell mound sits such as Minhou Tanshi Mountain（閩侯曇石山）, Minhou Zhuang Bianshan (閩侯莊邊山), Minhou Xitou (閩侯溪頭), and Yongning Dingshishan（邕寧頂獅山）. As for the etymologies, the words for 'bear' in KD and AN are cognates as shown in example 13.

13 PAN *Cumay 'Formosan black bear'
PK *C-me^{A}, PH *C-muy, PKS *hmoj^{A}, PT *^{h}mwɯj^{A} 'bear'

Formosan black bears are still hunted by the Bunun people of Taiwan. 'Formosan black bear' is a cognate in all Formosa languages, except Atayal and Taokas (Blust 2002) and also not found in Austronesian languages outside Taiwan.

Otter remains are rare in shell mound sites but are also widespread. They have been unearthed at sites such as Yongning Dingshishan (邕寧頂獅山), Sanya Luobidong (三亞落筆洞), Yuyao Hemudu（余姚河姆渡）, Yuyao Jingtoushan (余姚井頭山), Shanghai Songze（上海崧澤）, etc. Cognates for 'otter' in KD and AN are shown in example 14.

14 'otter' PAN *Sanaq, Kavalan *sani*, Thao *shanaq*, Paiwan *sanaq*
PH *hna:k, PT *na:k^{D}, Ong-Be Changliu *nak^{8}*, Longtang *nak^{8}*, Huangtong *nak^{8}*

Otters drive fish and shrimp into fishing nets from vegetation, stone bottoms or gaps (Wu 2007:76, 283), so they were probably assistants rather than targets for fishing and hunting by the PAT-speaking population. However, there is currently no strong evidence to support the domestication or use of otters for fishing by PAT-speaking people. This cognate is also not found outside Formosa.

Interestingly, the cognate reflexes of the above four mammals are limited to KD and Formosan languages but are not found outside Taiwan.

4.3 KD and AN cognates and shell mound botanic remains

The botanic remains of shell mounds include plant remains, wood fragments, phytoliths, sporopollen starch grains, and others. Remains of domesticated plants include carbonized rice and millet. However, the only known plant words preserved in KD and AN cognates are 'taro' and 'rattan'.

4.3.1 'taro', 'plant'

Since rhizomes crops are edible from skin to flesh, the probability of their being found in archaeological cultural deposits is relatively small. Therefore, archaeological remains of roots and tubers are very limited. Judging from the current archaeological evidence, carbonized tuber remains or taro starch granules of Dioscoreaceae have been found in Zengpiyan in Guilin, Guangxi, Guangfengshe Mountain in Jiangxi, Zhangshufancheng in Jiangxi, as well as Nia Cave in Sarawak, Madai in Sabah, and Leang Burung in Sulawesi, etc. Du (2017) combined archaeological materials of tuber plants with records of plant-based recipes from ancient texts such as *Yiwuzhi* (異物志 *Record of Foreign Matters*), *XuBowuzhi* (續博物志 *the Continue writing of Records of Diverse Matters*), *Nanfang Caomuzhuang* (南方草木狀 *Plants of the Southern Regions*), *Beihu Lu* (北戶錄 Records of Local Customs in Lingnan China during the Tang Dynasty), and *Lingwai Daida* (嶺外代答 *Representative Answers from the Region beyond the Mountains*), as well as indigenous ethnographic accounts in southern China. The analysis reveals that tuber plants occupied a dominant position in the diet of southern China ethnic groups since the late Paleolithic period, persisting into historical times. As for lexical data, KD and AN have cognates for 'taro' as shown in example 15.

15 PAN *biRaq 'wild taro, elephant's ear or itching taro, Alocasia spp'
PK *p-ɣak^{D}, PH *ra:k, POB *sa:k^{D1}, (*s > *Pr, Chen 2018:113), PKS *ʔra:k, PT *prɯək^{D}
'domesticated taro'

Although PAN*biRaq refers to wild taro, the PAT-Speaking population may have already practiced taro cultivation because KD and AN also have cognates of 'to plant' and 'to transplant'. Examples are present in 16 and 17.

16 'to plant' PAN *mula, PH *ura:, PKS *mpra[1]

17 PAN *CaNem 'grave, to bury', PMP *tanem 'grave; to bury; to plant'
POB *zo:m^{A1} 'plant (rice), transplant', PKS *ʔdram^{A} 'transplant', PT *t.nam^{A} 'transplant'

Cultivation and domestication are two distinct agricultural processes. Linguistic evidence suggests that PAT-speaking populations began cultivating taro, but it does not imply that they had domesticated taro. Although the term in KD refers to domesticated taro, the AN term still refers to wild taro. This suggests that the term referred to pre-domesticated taro at the PAT level.[4]

4.3.2 'rattan' and 'derris root'

There are rarely reports of 'rattan' or 'derris root' remains in shell mound sites in South China. The main reason is that organic matter has strict requirements on the preservation environment. However, the tool-making rattan is not limited to vines or climbing plants. Bamboo and reeds can also be used for rattan weaving. Baskets and fish traps woven from reeds and bamboo were discovered at the Jingtoushan（井頭山）site in Yuyao, Zhejiang (Institute of Cultural Relics and Archeology, Zhejiang 2022). Because the elastic long wooden 'rattan' processed from bamboo and reed is an important material for the PAT-speaking people to make storage or fishing trap tools, cognate words are left in KD and AN as shown in example 19.

19 PAN *quay 'rattan, Calamus sp.', Amis *ʔoway* 'reeds made from a plant that grows in the mountains; plant used in tying together poles, furniture, baskets'
PT *C.wa:j^{A}, Siamese *wa:j^{A1}* Sapa *va:j^{A1}* Cao Bang *wa:j^{A1}* Saek *va:j^{A1}* 'rattan'

The cognates of 'derris elliptica' in KD and AN, listed in example 20, are closely related to the fishing and hunting practices of the PAT-speaking people. Derris root contains rotenone, and when the juice produced after mashing its stems or roots is put into bodies of water with fish, the fish will show symptoms of poisoning and are easier to catch. Derris elliptica is naturally distributed in south China coastal areas. Using derris root to poison fish once existed on a large scale in southern China. It has been banned now, but it is still popular among Formosan aboriginals. Fishermen in coastal areas of Southeast Asia such as the Philippines still use derris root powder to fish in coral reef water where sea water is stagnant after low tide and in water where nets cannot be cast.

20 PAN *tubah 'a plant with roots that are pounded and put in rivers to stun fish: Derris elliptica'
PT *C̥.bɯə^{A}, Siamese *bɯə^{A1}* Sapa *bɯ^{A1}* Bao Yen *bɯə^{A1}* Saek *viə^{A1}* 'poison (fish), to'

Apparently, the word form in PT experienced a change from the noun 'derris root' to the verb 'poison (fish), to'. 'rattan' and 'derris root' were not found in KD other than Tai, which is probably the result of language sampling because there are no 'rattan' or 'derris root' entries for in most language survey lexical lists.

4 PMP *tales denotes domesticated taro. Blench (2010) considers it to be an Austronesian loan from Austroasiatic (PAA *sroʔ), but this comparison is not convincing in terms of phonetic correspondence. Sidwell and Blench (2011) believe that the search for moist river valleys suitable for growing taro was a 'push factor' in the expansion of AA-speaking peoples. In fact, research on the chloroplast DNA diversity of domesticated taro, wild taro, and related plants of the genus Colocasia indicates that the domestication of taro originated in the tropical and temperate zones of Southeast Asia (Ahmed et al. 2020). This suggests that taro domestication was most likely accomplished by AA speakers and spread to AN speakers, but whether the spread of domesticated taro was accompanied by the spread of the term 'taro' remains an open question.

4.4 KD and AN cognates and fishing-hunting tools in shell mound ruins

The artefacts at the shell mound sites along the coast of South China are mainly production tools for fishing, hunting, agriculture, and handicrafts, as well as daily utensils. However, only fishing and hunting tools have found a small number of corresponding 'linguistic fossils' in KD and AN cognates. Fishing and hunting tools in the shell mound sites include spears, arrowheads, stone balls, net sinkers, fish bladders and harpoons, fishhooks, fish traps, boats, oars, and the like. However, only words meaning 'boat', 'fishhook' and 'fishing net' have retained cognates in KD and AN.

4.4.1 'boat'

Boats were an important tool for prehistoric PAT-speaking people to cross rivers and seas to engage in fishing and hunting. The 8,000-year-old canoe unearthed at Kuahuqiao (跨湖橋) in Zhejiang, and the Han Dynasty canoes discovered in Lianjiang Pukou（連江浦口）in Fujian, Huazhou (漢口) in Guangdong, and Qinzhou (欽州) in Guangxi during the early historical archeology of South China are considered to be the remains of South China's indigenous sea vessels (Wu C.M. 2009). Ostapirat (2013) and Smith (2022) propose that Heitu (Hlai) *ra:* 'boat', Baoting (Hlai) *va:* 'boat' and PT *Ç.rwɯə^{A} 'boat' and PAN *aluja 'to paddle' are cognates . In fact, the word forms for 'boat' in all KD branches are cognate with PAN *aluja 'to paddle' as listed in example 21.

21 PAN *aluja 'to paddle', Thao *ruza* 'boat, canoe' *pa-ruza* 'boat, canoe, to paddle', Kavalan *paluna* 'paddle, to paddle'
PAN *pa-aluja 'to paddle', Thao *pa-ruza* 'boat, canoe; a canoe paddle', Kavalan *paluna* 'paddle, oar; to paddle, to row'
PK *da^{A}, PH *ura:^{A}, POB *zua^{A2}, PKS *ʔdrɨa^{A}, PT *Ç.rwɯə^{A}

However, the semantic shift from 'boat' to 'paddle' cannot be fully explained. Formosan languages provide clues to this semantic shift and the origin of the first vowel *a. Thao *ruza* 'boat, canoe', with no first vowel *a, is consistent with KD both semantically and phonetically. Thao *pa-ruza* and Kavalan *paluna* is composed of *ruza*/*luna* 'boat' and the causative prefix *pa-*. Obviously, the first vowel *a and the semantic transfer of PAN *aluja come from the consonant loss of the causative prefix *pa, *pa-luja 'paddle a boat/canoe' > *aluja 'to paddle'. Thus, PAN 'boat, canoe' can be reconstructed as the normal disyllabic root *luja.

4.4.2 'fishhook'

Fishhooks made of bone or shellfish have been unearthed at various sites, including Dongshan Damaoshan (東山大帽山), Yongning Dingshishan (邕寧頂獅山), Yongning Jiangkou（邕寧江口), and Penghu Suogang (澎湖鎖港). KD and AN retain cognates meaning 'fishhook' as shown in example 22, but in KD, it is only in the Tai branch.

22 PAN *kabit*kawit 'hook', Pazeh *kabit* 'hook', Amis *kafit* 'attached to, stuck to; to hang'
PT *ɓet^{D}, Siamese *bet^{DS1}* Sapa *bit^{DS1}* Cao Bang *bet^{DS1}* Lungchow *bit^{5}*

4.4.3 'fishnet'

The large number of net sinkers found in shell mound sites suggests that the ancestors of these sites used trawl nets to obtain aquatic animal resources. The Maori of New Zealand take boats and use trawl nets to fish for clams, oysters and other aquatic shellfish (Waselkov, 1987: 93-210). Nets sinkers have been unearthed from Minhou Tanshishan (閩侯曇石山), Minhou Xitou (閩侯溪頭), Minhou Zhuangbianshan (閩侯莊邊山), Xiapu Dongguashan (霞浦黃瓜山), Kinmen Fuguodun (金門富國墩), Penghu Suogang (澎湖鎖港), Nanning Baozitou (南寧豹子頭), Zengcheng Jinlan Temple (增城金蘭寺) and other sites. Fishing nets are generally made of plant fiber or animal leather,and these materials are prone to decay and degradation, so it is difficult to leave remains in shell mounds. However, fishing net fragments have been unearthed from the Yuyao Jingtoushan (余姚井頭山) site dating from 8,300

to 7,800 years ago (Tong and Gong 2022). KD and AN may have retained cognates for 'fishnet', as listed in example 23.

23 'fishnet' PAN *aray, PH *rəːyʔ, POB*saj^{BC1} (*s > *Kr, Chen 2018:113), PKS *ke^{1}, PT *kre:^{A}

It should be noted that the *aray, which was first proposed by Ostapirat (2005), is not included in the *Austronesian Comparative Dictionary*. There is also confusion in explaining the reflex of the first consonant *K in the Kra-Dai language.

4.5 KD and AN cognates and archaeological findings on prehistoric trade across the Taiwan Strait

Guo et al. (2005) analyzed the petrography and chemical composition of stone adze materials unearthed from prehistoric sites of Dongshan Damaoshan (東山大帽山) and Penghu Suogan (澎湖鎖港), indicating that the Penghu Islands were the source of raw materials for stone adzes in Damaoshan. A large number of stone tools or pottery from Penghu have also been found at prehistoric sites in southwestern Taiwan (Zang 2001). This shows that there was a cross-strait trade system with Penghu as a relay station on both sides of the Taiwan Strait in the Neolithic Age. This prehistoric trade practice is also supported by cognates in KD and AN. Examples are listed in 24 to 27.

24 PAN *beli 'to buy', PMP *beli 'value, price; marriage prestations, brideprice; purchase'
PLakkja *wlei^{C} 'to buy', *plei^{A} 'to sell', PH *p-ləy 'exchange'

25 PWMP *beli-an 'be bought from or for someone; what one has bought'
PSWTai *plian^{B2} 'to exchange', POB *vian^{A1} 'to buy'

26 PAN *baliw 'to buy, to sell', PH *ri:wʔ

27 PAN *saliw 'to buy, to sell', PK *s-ɣwi^{A}

28 Proto Tibeto-Burman *b-rey 'to buy, barter', Old Chinese *mˁrajʔ 'to buy'
Proto-Katuic *bləj 'to buy', Sre *blei* 'to buy'

'to buy, to sell' and 'to exchange' are all expressed by the comparable word forms among the ancestors of KD and AN, which indicates that the PAT-speaking people are in the stage of barter exchange. It is worth noting that the *-an in PWMP *beli-an is the location focus mark. Since KD has experienced the evolution from polysyllabic to monosyllabic, the *-an of PSWTai and POB no longer has the grammatical function of location focus. This is the first time that evidence of focus mark fossilization has been found in KD, indicating that the focus mark system is not unique to AN and possible existed in the PAT. In addition, we found that the PAT speaker's 'buy, sell' also exists in AA and Sino-Tibetan as shown in example 28. We speculate that there should have been trade exchanges between prehistoric AT-speaking people, AA-speaking people and ST-speaking people.

5 Conclusion

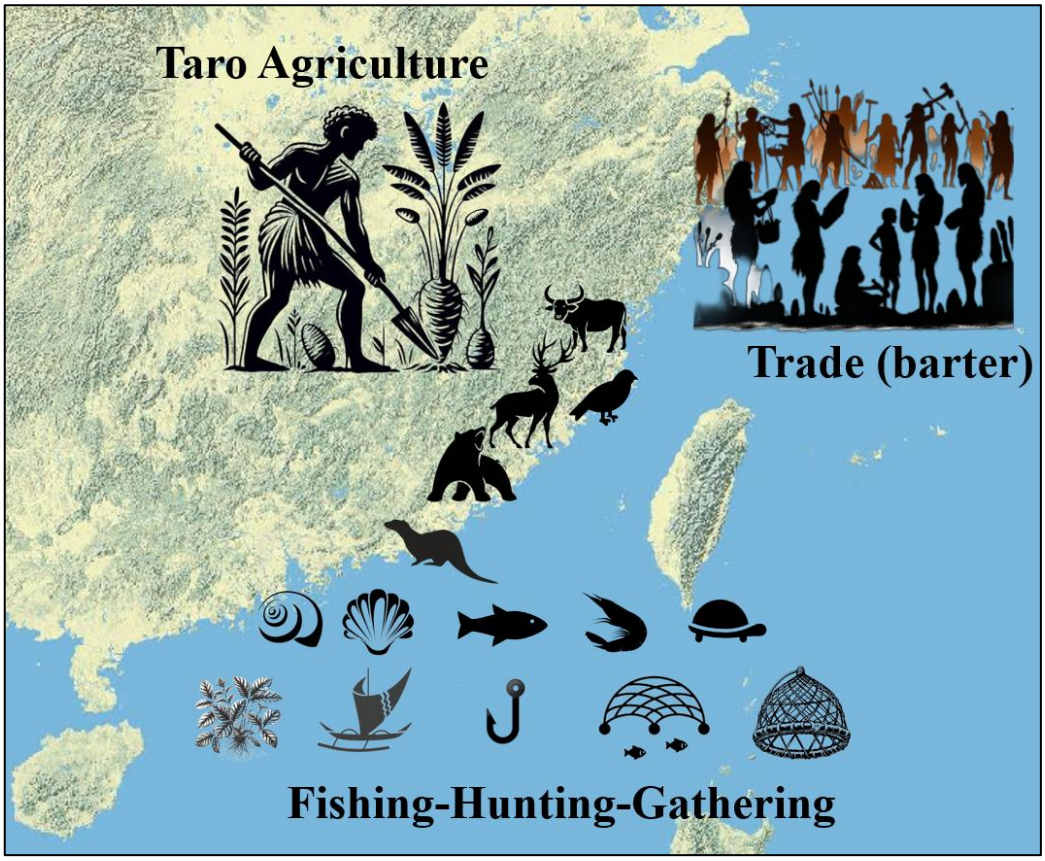
The connection between archaeological unearthed remains and linguistic cultural reconstructions is an important research direction for interdisciplinary cooperation between Austronesian archeology and linguistics. Based on the linguistic archaeological comparative analysis of the above KD and AN cognates and the unearthed remains from Neolithic shell mound sites along the coast of South China, Table 1 and Figure 2 display the linguistic evidence of the livelihood environment and livelihood patterns of the PAT-speaking people. Lexical reconstructions related to coastal environments suggest that the living environment of the PAT-speaking people is located in coastal areas. The absolute number of KD and AN cognates corresponding to animal remains and fishing-hunting tools at shell mound sites indicates that the livelihood patten of PAT speakers was mainly fishing, hunting and gathering. At the same time, linguistic evidence also supports the hypothesis that the PAT-speaking people have a livelihood model of taro cultivation, agriculture and trade. The linguistic evidence of the livelihood

patterns of the PAT-speaking people is consistent with archaeological observations of the livelihood patterns of the indigenous people in the coastal areas of South China during the Neolithic. This shows that the Neolithic coastal indigenous people of South China in archaeology were PAT-speaking people or the ancestors of KD and AN.

Table.1 *KD and AN Cognates Reflecting the Livelihood Patterns of Austro-Tai-Speaking People*

			Cognates of Kra-Dai & Austronesian
Livelihood environment			‘water’, ‘flow’, ‘current (stream)’
Livelihood Patterns	**Fishing, Hunting, Gathering**	**Objects**	‘snail, clam’, ‘fish (eat)’ ‘fish scale’, ‘soft-shell turtle’, ‘shrimp’, ‘birds’, ‘deer, large ruminant’ ‘bear(n.)’, ‘otter’
		Tools	‘rattan’, ‘derris root’, ‘boat’, ‘fishhook’, ‘fishnet’
	Agriculture		‘taro’, ‘plant’, ‘transplant’
	Trade or Exchange		‘buy, sell’, ‘exchange’

Figure 2: *Livelihood Patterns of the PAT-Speaking Population*



Interestingly, the linguistic evidence of the livelihood patterns of the PAT-speaking people does not offer KD and AN etyma related to rice agriculture, nor does it have etyma for domesticated animals such as ‘pig’ and ‘ dog’. This suggests that the split of KD and AN occurred before rice agriculture and domesticated livestock were introduced or happened in the PAT community.

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ADJECTIVE ORDERING IN IU MIEN

Low SAELEE & Yining NIE
San José State University
lowsaelee@gmail.com & yining.nie@sjsu.edu

Abstract
Like in other Hmong-Mien languages, the majority of adjectival modifiers in Iu Mien are postnominal and have both attributive and predicative uses. However, Iu Mien also has a handful of adjectival modifiers, borrowed from Chinese, that occur prenominally and are restricted in their syntactic distribution. In this paper, we investigate the syntax of these loan modifiers and propose three stages of change to account for the development of a prenominal, attributive-only modifier to a postnominal modifier with unrestricted uses, via reanalysis of attributive modification as predicative modification within a reduced relative clause.

Keywords: Syntax, adjective, word order, Iu Mien, Hmong-Mien
ISO 639-3 codes: ium, mji, hmn, cmn

1 Introduction

The lexical category of "adjective" describes a class of words used to modify a noun. Adjectives may have two syntactic functions, modifying the noun directly in its attributive function (e.g., *the tall man*) or indirectly in its predicative function (e.g., *the man is tall*) (Dixon 2004). Cross-linguistically, attributive adjectives may be prenominal, as in English and Chinese, or postnominal, as in Thai. Some languages, such as French, have both prenominal and postnominal adjectives; in French, it is possible for the same adjective to be used either prenominally or postnominally, with a slightly different meaning (Laenzlinger 2004).

In this paper, we discuss the syntax of adjectives in the Hmong-Mien language Iu Mien (ISO: ium). The majority of Iu Mien attributive adjectives are postnominal, as in examples (1) to (3). The adjectives *maeng* 'green', *mbuov* 'blue', *waaic* 'broken', and *nzueic* 'beautiful' all follow the nouns *lui* 'shirt', *don* 'chair', and *biauv* 'house'.[1]

(1) *naaiv* *yiemc* *lui-* *maeng*
DEM CLF shirt green
'this green shirt'

(2) *naaiv* *norm* *don-* *mbuov-* *waaic*
DEM CLF chair blue broken
'this broken blue chair'

(3) *naaiv* *norm* *biauv-* *siqv-* *nzueic*
DEM CLF house red beautiful
'this beautiful red house'

[1] Iu Mien examples in this article employ the "Unified Script" or "New Roman Script" (Arisawa 2016) orthography, which was standardized in the 1980s (Purnell 1987). Tones are represented with a final <c, v, h, x, z>, and tone sandhi is represented with a hyphen <->, unless the citation form and surface form of the tone is the same (Purnell 2012); modification within the noun phrase triggers tone sandhi while predicative modification does not. The article follows the Leipzig Glossing Rules, with the additional abbreviation: AFF = affirmative.

A handful of adjectives, however, are prenominal, as shown in examples (4) to (6).

(4) *naaiv norm fiuv- sic*
DEM CLF small problem
'this little problem'

(5) *naaiv norm siang- nzormc*
DEM CLF new bowl
'this new bowl'

(6) *naaiv kuaiv loz- fangx*
DEM CLF old picture
'this old picture'

Iu Mien thus bears some similarity to French in having both prenominal and postnominal adjectives. However, unlike French, the same adjective cannot be used both prenominally and postnominally.[2] Prenominal adjectives cannot appear postnominally, as in (7), and postnominal adjectives cannot appear prenominally, as in (8).

(7) **naaiv yiemc maeng- lui*
DEM CLF green shirt
'this green shirt'

(8) **naaiv norm sic- fiuv*
DEM CLF problem small
'this little problem'

In this paper, we investigate the nature of these prenominal adjectives and their implications for Iu Mien syntax more generally. Previous work by Purnell (1972), Downer (1973), Court (1985), Ratliff (2010), and Arisawa (2016) suggests that the prenominal adjectives are loanwords from Chinese, which explains their exceptional word order. However, if we consider all of the adjectives in Iu Mien that are plausibly Chinese loans, we find that they can exhibit different syntactic behavior. While some Chinese loan adjectives are strictly prenominal, others are postnominal; some can only be used attributively while others can also be used predicatively. The heterogenous behavior of this group of adjectives, particularly on varieties of Iu Mien spoken in Thailand, suggests that they are undergoing change due to language contact.

We note that our use of the term "adjective" is not uncontroversial. Adjectives in Lao (Enfield 2004), Thai (Post 2008), and Hmong (Bisang 1993) have been analyzed as stative verbs, that is, as predicates. Iu Mien adjectives have also been analyzed as stative verbs by Court (1985). However, some of the Chinese loanwords under investigation can only be used attributively and not predicatively, and therefore do not behave like stative verbs. We will thus use the term "adjectival modifier" instead of stative verb. This paper examines the nature of the prenominal adjectival modifiers in Iu Mien and their characteristics.

1.1 Language background

Iu Mien, also known as Yao, is a tonal SVO language with an estimated 840,000 speakers (Ratliff 2010) in China, Vietnam, Thailand, Laos, United States, Canada, and Australia (Barker & Saechao 1997). The language had close and prolonged contact with Chinese, resulting in Chinese loanwords in all parts of

[2] Adjectives such as *jaav* 'fake' which have been observed to exceptionally occur both prenominally and postnominally will be shown to be undergoing a change in progress.

speech (Purnell 1972). Data for this project comes from original fieldwork with two Iu Mien speakers also fluent in English (including the first author) in Northern California.

Word order within the Iu Mien noun phrase is given in (9). With the exception of adjectives, nominal modifiers generally precede the head noun. Modification within the noun phrase triggers tone sandhi, usually indicated orthographically with a hyphen.

(9)	Demonstrative >	Numeral >	Classifier >	Adjective >	Noun>	Adjective
	naaiv	*buo*	*yiemc*	*siang-*	*lui-*	*siqv*
	DEM	three	CLF	new	shirt	red
	'these three new red shirts'					

Relative clauses also precede the head noun, as shown in (10), and are ordered after demonstratives and before numerals within the noun phrase, as in (11). The relative pronoun *uov* and classifier *yiemc* in (10) can be omitted, resulting in a reduced relative clause.

(10)	[*Yie*	*maaiz*	*daaih*	*uov*]	*yiemc*	*lui*	*naaic*	*siqv*	*nyei.*
	1SG	buy	come	REL	CLF	shirt	RETOP	red	AFF
	'The shirt that I bought is red.'								

(11)	*naaiv*	*[yie*	*maaiz*	*daaih*	*uov]*	*buo*	*yiemc*	*siang-*	*lui-*	*siqv*
	DEM	1SG	buy	come	REL	three	CLF	new	shirt	red
	'these three new red shirts that I bought'									

Most adjectives in the language are postnominal in their attributive use (12). Postnominal adjectives may be used both attributively and predicatively, as diagnosed by the predicative intensifier *haic* 'very' (13) and clausal negation *maiv* (14) (Arisawa 2016).

(12)	*Ninh*	*oix*	*zuqv*	*naaiv*	*yiemc*	*lui-*	*maeng.*
	3SG	like	wear	DEM	CLF	shirt	green
	'He likes to wear this green shirt.'						

(13)	*Naaiv*	*yiemc*	*lui*	*maeng*	*haic.*
	DEM	CLF	shirt	green	very
	'This shirt is very green.'				

(14)	*Naaiv*	*yiemc*	*lui*	*maiv*	*maeng.*
	DEM	CLF	shirt	neg	green
	'This shirt is not green.'				

1.2 Status of adjectives

While dynamic verbs denote events with internal structure that may exhibit changes over time, stative verbs denote events with steady states, whereby "every instant involves the same lexical content" (Smiecinska 2003). Like other languages in the Hmong-Mien, Sino-Tibetan and Kra-Dai language families, adjectives in Iu Mien have been categorized as stative verbs. Enfield (2004) argues that Lao adjectival modifiers are stative verbs because they can combine with verbal markers such as perfective aspect in their predicative use. Similarly in Iu Mien, both dynamic verbs (15) and adjectival modifiers (16) can combine with the perfective marker *mi'aqv*, the latter indicating a change of state. Adjectives in Iu Mien have therefore been analyzed as stative verbs (Court 1985, Arisawa 2016).

(15) *Naaiv yiemc lui ndortv mi'aqv.*
DEM CLF shirt fall PFV
'This shirt fell.'

(16) *Naaiv yiemc lui ndaauv mi'aqv.*
DEM CLF shirt long PFV
'This shirt became long.'

Under the view that Iu Mien adjectival modifiers are not truly adjectives but stative verbs, what appears at first glance to be an attributive modifier, as in (17), should instead be analyzed as a predicative modifier within a reduced relative clause. However, since relative clauses in the language are prenominal, as shown in (18), this would not derive the correct word order for adjectives, which are generally postnominal.

(17) *Ninh oix naaiv yiemc lui- ndaauv.*
3SG like DEM CLF shirt long
'He likes this long shirt.'

(18) *Ninh oix naaiv ndaauv uov yiemc lui.*
3SG like DEM long REL CLF shirt
'He likes this shirt that is long.'

Additionally, if adjectival modifiers were truly stative verbs in Iu Mien, then we would expect all modifiers to be able to be used predicatively and combine with the perfective marker *mi'aqv*. However, this is not the case. Adjectival modifiers that cannot co-occur with *mi'aqv* include *domh* 'big', *fiuv* 'small' and *hieh* 'wild'.

(19) **Naaiv yiemc lui domh mi'aqv.*
DEM CLF shirt big PFV
'This shirt became big.'

(20) **Naaiv norm sic fiuv mi'aqv.*
DEM CLF problem small PFV
'This problem became small.'

(21) **Naaiv dauh dungz hieh mi'aqv.*
DEM CLF pig wild PFV
'This pig became wild.'

Given the issues that arise with the stative verb analysis, we continue to use the term "adjectival modifier" to refer to all words of the class in Iu Mien that are comparable to the prototypical adjective.

2 Prenominal Adjectival Modifiers

While most adjectival modifiers in Iu Mien are postnominal, there are a handful that occur prenominally. These prenominal adjectival modifiers, listed in Table 1, have been identified as loanwords from Chinese and were borrowed into Iu Mien with the superstrate Chinese word order (Purnell 1972, Downer 1973, Court 1985, Ratliff 2010, Arisawa 2016).[3]

[3] Arisawa (2016) includes *domh* 'big' as a prenominal Chinese loan adjective. However, Court (1984) and Purnell (2012) state that *domh* was not borrowed from Chinese; Downer (1973) points out another adjective

Table 1: *Prenominal adjectival modifiers borrowed from Chinese*

Iu Mien (Unified)	Iu Mien (IPA)	Mandarin (Pinyin)	Mandarin (IPA)	Cantonese	English
siang	siaŋ33	xīn 新	ɕɪn55	san1	new
loz	lo231	lǎo 老	lɑʊ21	lou5	old
fiuv	fiu44	xiǎo 小	ɕjɑʊ21	siu2	small
jaav	ca:44	jiǎ 假	tɕa35	gaa2	fake
zien	ɕien33	zhēn 真	ʈʂən55	zan1	real
hieh	hie31	yě 野	jɛ21	je5	wild

Other adjectival modifiers identified by Ratliff (2010) as Chinese loans from Middle Chinese (ca. 500 AD), however, are postnominal in the current language. Ratliff's list of postnominal loans, which is non-exhaustive, is given in Table 2. We assume that these postnominal adjectival modifiers were once prenominal and became nativized over time.

Table 2: *Postnominal adjectival modifiers borrowed from Chinese*

Iu Mien (Unified)	Iu Mien (IPA)	Middle Chinese	Modern Chinese (Pinyin)	Mandarin (IPA)	Cantonese	English
sui	sui33	swan	suān 酸	swan55	syun1	sour
hepc	hep11	hɛp	zhǎi 窄	ʈʂaɪ21	zaak3	narrow
siqv	si55	tsyhek	chì 赤	ʈʂʰɚ51	cek3	red
nzaaih	dza:i31	dza	cuó 齹	tsʰuɔ35	co4	salty
lueic	luei11	lwojH	lèi 累	leɪ51	leoi6	lazy/tired

In this section, we present the various stages of change of Chinese loan modifiers, using both historical and synchronic evidence. We show that loan modifiers, borrowed initially with prenominal word order and only used attributively, may then expand to predicative uses, and may then finally become postnominal.

2.1 Stage 1: Initial Borrowing

We assume that all adjectival modifiers loaned from Chinese were borrowed into Iu Mien with prenominal word order, reflecting the word order properties of the superstate language. Six loan modifiers remain prenominal in the current language listed in Table 1. In addition to their exceptional word order, two of these six can only be used attributively and not predicatively; *fiuv* 'small' (22), and *hieh* 'wild' (23) cannot appear with, for example, the predicative intensifier *haic* 'very'.

(22a) *naaiv norm fiuv- sic.*
DEM CLF small problem
'this little problem'

(22b) **Naaiv norm sic fiuv haic.*
DEM CLF problem small very
'This problem is very small.'

daaic 'big', which is restricted to a ritualized register of the language, that is more likely related to Chinese 大 *dà/dài*. We therefore omit *domh* from our list of loanword adjectives and assume instead that it is a noun which can be the initial element of a noun-noun compound. We thank Mark Alves for discussion of the loan status of *domh*.

(23a) *naaiv* *dauh* *hieh* *dungz*
DEM CLF wild pig
'this wild pig'

(23b) **Naaiv* *dauh* *dungz* *hieh* *haic.*
DEM CLF pig wild very
'This pig is very wild.'

We posit that these two modifiers preserve the initial state of Chinese loanwords, which were syntactically segregated from native adjectival modifiers not only in their prenominal word order but also by their limited distribution as attributive-only modifiers. The other four prenominal adjectives given in Table 1, however, can be used both attributively and predicatively in the current language; we suggest that these adjectives have progressed to the next stage of change: syntactic expansion.[4]

2.2 Stage 2: Syntactic Expansion

Siang 'new', *loz* 'old', *jaav* 'fake', and *zien* 'real' are prenominal loan modifiers that expanded in their syntactic distribution to include predicative uses, as shown in (24b) for *siang*.

(24a) *naaiv* *norm* *siang-* *biauv*
DEM CLF new house
'this new house'

(24b) *Naaiv* *norm* *biauv* *siang* *haic.*
DEM CLF house new very
'This house is very new.'

We propose that this change was facilitated by a reanalysis of some prenominal modifiers as a reduced relative clause. In reduced relative clauses, certain elements such as relative pronouns are deleted without altering the meaning of the clause (Master 2002). Relative clauses occur prenominally in Iu Mien, as shown by the full relative with a verbal predicate in (25a). In its reduced relative counterpart in (26b), the relative pronoun *uov* and classifier *dauh* are omitted.

(25a) [*zueiz* *jienv* *don* *uov*] *dauh* *mienh*
sit PROG chair REL CLF person
'the person who is sitting on the chair'

(25b) [*zueiz* *jienv* *don*] *mienh*
sit PROG chair person
'the person sitting on the chair'

Prenominal loan modifiers such as *siang* 'new' which can be used predicatively can also appear in full relative clauses, as shown in (26a). Omitting the relative pronoun and classifier would produce the reduced relative clause in (26b), which is strikingly identical in form to an attributive use of the prenominal modifier.

(26a) *siang* *uov* *norm* *biauv*
new REL CLF house
'the house that is new'

[4] The loan modifier, *fiuv* 'small', has competing native counterparts, *faix* 'small', which may explain why the loan modifier has not undergone syntactic expansion to predicative uses.

(26b) *siang- biauv*
new house
'new house'

We propose that the attributive use of prenominal modifiers like *siang* was reanalyzed as a reduced relative clause. Since most adjectival modifiers are postnominal but relative clauses are prenominal in Iu Mien, this reanalysis accounts for the apparently exceptional word order of these loan modifiers. Importantly, relative clauses have the internal syntax of predicates; in order for the modifier to appear in a relative clause, then, a predicative use must have been innovated. The structural overlap and surface similarity between direct modification and reduced relative modification, which has been pointed out by Cinque (2014), among others, then allowed attributive, direct modification to be reanalyzed as predicative modification within a reduced relative clause. Thus, the prenominal adjectival modifiers expanded their syntactic function.

2.3 Stage 3: Nativization

An adjectival modifier being prenominal is a clear indication of being a Chinese loan. However, the loan modifiers given in Table 2, identified by Ratliff (2010) as being borrowed from Middle Chinese, are postnominal today and syntactically indistinguishable from native adjectival modifiers. We posit that these postnominal adjectival modifiers were once prenominal. Data collected by Arisawa (2016) during his time in an Iu Mien village in Northern Thailand provides evidence for this development. He noticed that "those Iu Mien who have knowledge of Chinese tend to prepose these adjectival elements to the head noun, whereas younger Iu Mien who are familiar with Thai tend to postpose them" (2016: 433). *Jaav* 'fake', for example, was used prenominally by the older speakers he consulted (27a) but postnominally by younger speakers (27b).

(27a) *jaav- nyaanh*
fake silver
'counterfeit money'

(27b) *nyaanh jaav*
silver fake
'counterfeit money'

(27c) *naaiv nyungc nyaanh jaav nyei.*
DEM kind silver fake AFF
'This money is counterfeit.' (Arisawa 2016: 434, modified gloss)

Importantly for our proposal, both groups of speakers allow *jaav* to be used predicatively (27c). For Arisawa's older speakers, then, *jaav* has undergone syntactic expansion to a predicative function. For his younger speakers, *jaav* not only expanded in its function but then became completely nativized, adopting the postnominal word order of native Iu Mien adjectival modifiers. Thus, syntactic expansion of the loan modifiers into a predicative function occurs first before changing to postnominal word order and full nativization.

2.4 Summary of Stages of Change

The proposed stages of change for Chinese loan modifiers and their features are summarized in Table 3. Arisawa (2016) also mentioned the three stages of Chinese loans in the Iu Mien language. At Stage 1, Chinese loans are borrowed into Iu Mien with prenominal word order and only attributive uses, thereby distinguishing them in both word order and syntactic distribution. At Stage 2, the attributive function of Chinese loans, being exceptionally prenominal, is reanalyzed as reduced relative clause modification, resulting in an expansion of the modifiers' syntactic function to include the predicative

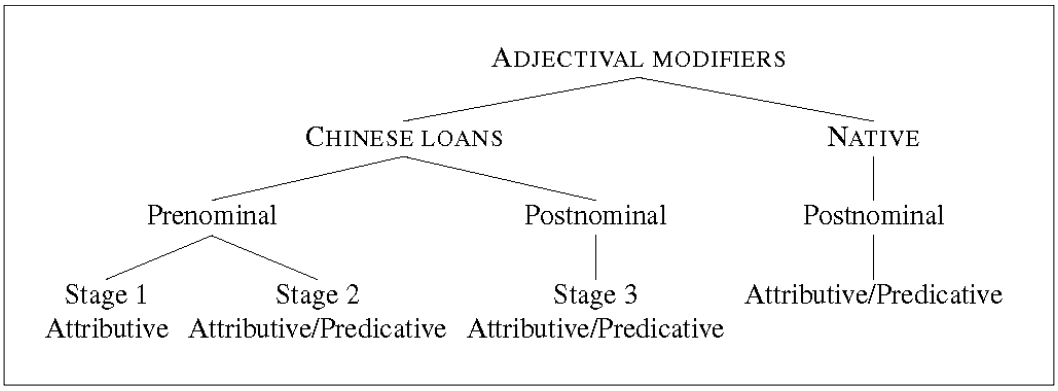
use. Finally, at Stage 3, the loan modifiers undergo a change from prenominal to postnominal word order, thus becoming indistinguishable from the native Iu Mien adjectival modifiers. The modifier *jaav* 'fake' appears as an example for both Stage 2 and Stage 3 as it is undergoing a change in progress towards nativization.

Table 3: *Iu Mien Chinese Loan Stages of Change*

	Stage 1: Initial Borrowing	**Stage 2: Syntactic Expansion**	**Stage 3: Nativization**
Uses	Attributive	Attributive and predicative	Attributive and predicative
Word Order	Prenominal	Prenominal	Postnominal
Examples	*fiuv* 'small', *hieh* 'wild'	*loz* 'old', *siang* 'new', *zien* 'real', *jaav* 'fake' (for older speakers)	*sui* 'sour', *hepc* 'narrow', *siqv* 'red', *nzaaih* 'salty', *lueic* 'lazy/tired', *jaav* 'fake' (for younger speakers)

The hierarchy in Figure 1 provides an overview of native and borrowed Iu Mien adjectival modifiers and their syntactic properties. The native adjectival modifiers exhibit uniform behavior, being postnominal and both attributive and predicative. At each successive stage of the Chinese loans, they look more like the native adjectival modifiers, eventually becoming syntactically indistinguishable at Stage 3.

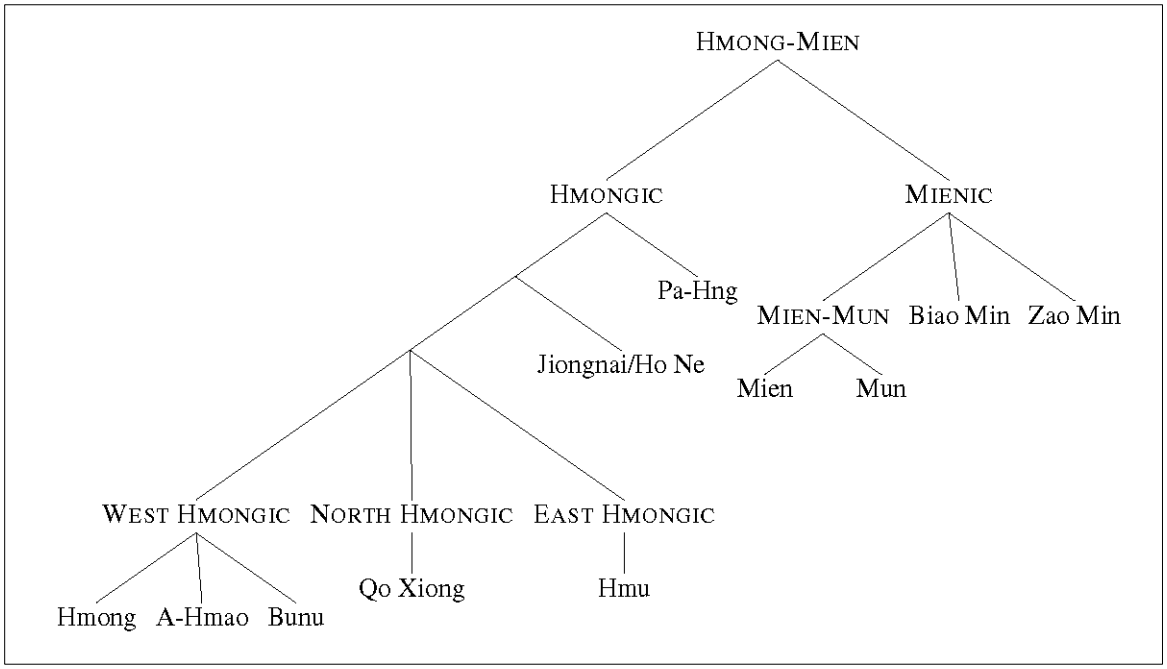
Figure 1: *Hierarchy of Iu Mien Chinese loans and native adjectival modifiers*



3 Related languages

We find further evidence for the proposed stages of change from related languages such as Kim Mun (ISO: mji) and Hmong (ISO: hmn). As shown in Figure 2, Kim Mun is the language variety most closely related to Iu Mien, while Hmong is in a different branch of the language family. Like in Iu Mien, adjectival modifiers in Kim Mun and Hmong are predominantly postnominal, with the exception of some Chinese loan modifiers. The following data were elicited from three Kim Mun speakers living in China and one Hmong speaker in Northern California.

Figure 2: *Hierarchy of the Hmong-Mien language family (Ratliff 2010:3)*



3.1 Kim Mun

Data from Kim Mun shows evidence of syntactic expansion (Stage 2) of Chinese loan modifiers. For example, *xangd* 'new' (from 新 *xīn*) is a prenominal Chinese loan modifier that can be used either attributively (28a) or predicatively, as shown by its use with the intensifier *gau* 'very' (28b).[5]

(28a) *xangd* *biauv*
new house
'new house'

(28b) *Wav* *xeenl* *biauv* *gau* *xangh.*
That CLF house very new
'That house is very new.'

The Kim Mun modifier *luv* 'old' (from 老 *lǎo*), meanwhile, is undergoing the process of nativization (Stage 3), like Iu Mien *jaav* 'fake' (from 假 *jiǎ*). One of the Kim Mun speakers we consulted produced the adjectival modifier prenominally (29a) while the two others produced it postnominally (29b), although all speakers seemed to accept both word orders. While we found no correlation with age, we do note that our speakers were from different regions of China. We note, furthermore, that *luv* can be used predicatively by all speakers (29c), which supports our argument that syntactic expansion via predicative modification must occur before full nativization via change in word order.

(29a) %*luv* *biauv*
old house
'old house'

[5] We thank Mark Alves for discussion of the Chinese source words for Kim Mun and Hmong loans.

(29b) %*biauv* *luv*
house old
'old house'

(29c) *Wav* *xeenl* *biauv* *gau* *luv.*
That CLF house very old
'That house is very old.'

3.2 Hmong

Our data for Hmong are not as robust as the data for Kim Mun, but nonetheless provide some evidence for Stage 3, nativization. Bisang (1993) and Jaisser (1995) both report several Chinese loan modifiers with prenominal word order at the time of publication: *nyuag* 'little' (小), *tuam* 'big' (大), *niag* 'enormous, important, high [in rank]' (嚴), *qub* 'old, former' (故), *zoo* 'good' (好), and *laus* 'old' (老) (see also Ratliff 2009 on Chinese loans in White Hmong). Due to a difference in vocabulary, our Hmong consultant was not able to verify all of these modifiers. However, we were able to obtain judgments for *laus* 'old'. As shown, our consultant uses *laus* postnominally (30a) and predicatively (30b), indicating that the modifier has been fully nativized.

(30a) *txiv neej* *laus*
man old
'old man'

(30b) *Tus* *txiv neej* *laus* *heev.*
DEM man old very
'The man is very old.'

4 Conclusion

While most adjectival modifiers in Iu Mien appear after the head noun, a handful of modifiers borrowed from Chinese appear prenominally. In this paper, we showed that Chinese loan modifiers in Iu Mien do not have a uniform syntactic behavior, but can differ in word order as well as in the availability of a predicative function. We proposed three stages of change that account for the development of a modifier from its restricted distribution as an attributive-only modifier with prenominal word order to unrestricted uses with postnominal order, via reanalysis of attributive modification as predicative modification within a reduced relative clause. These modifiers are now used by younger generations of Iu Mien speakers exactly like native adjectival modifiers, unaware that they are loans at all. The nativization stage can also be witnessed in related languages such as Kim Mun where certain prenominal adjectival modifiers can also be used postnominally. We hope that our investigation of adjectival modifiers in Iu Mien provides insight into the syntactic consequences of borrowing and language contact, particularly with under-studied languages.

Finally, Iu Mien has been considered to lack adjectives as a distinct lexical category. The fact that adjectival modifiers are generally postnominal while all other noun phrase constituents are prenominal, along with the presence of attributive-only loans, may suggest that Iu Mien indeed has true adjectives.

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THE SITUATION OF LANGUAGE USE AMONG THE KRI PHOONG, MA LIENG, AND RUC ETHNIC GROUPS IN VIETNAM

NGUYỄN Hữu Hoành[1]
School of Languages and Tourism, Hanoi University of Industry
nhhoanh2004@gmail.com

BÙI Thị Ngọc Anh[2]
Institute of Linguistics, Vietnam Academy of Social Science
buithingocanhvtd@gmail.com

Abstract
Based on the results of a sociolinguistic survey that we conducted in August to September of 2019, this article aims to clarify the *conscious awareness of language* as well as the *actual language use* and *language preferences*, particularly the use of mother tongues, among the Kri Phoong, Ma Lieng, and Ruc ethnolinguistic groups, whose languages belong to the Vietic branch of Austroasiatic. In north-central Vietnam, these are local groups with very small populations only in the hundreds, and there is a significant risk of language loss among these groups. Therefore, the article aims to achieve two objectives: (1) to provide additional sociolinguistic data for linguistic researchers in their ongoing work of verifying the linguistic components within the Vietic group and (2) to raise awareness about negative trends in language use and subsequently propose necessary measures to prevent the potential extinction of the Kri Phoong, Ma Lieng, and Ruc languages.

Keywords: language situation, language loss
ISO 639-3 codes: aem, mtq, scb, vie

1 Introduction

In the most recent research on Vietic affiliation, Sidwell and Alves (2021) identify five subgroups with 17 different languages in the Vietic language group, including Vietnamese, Muong, Nguon, Cuoi, Tho, Phong, Toum, Li Ha, Arem, May, Ruc, Sach, Kri, Maleng, Malieng, Ahao/Ahlao, Tha Vung. Except for Toum, Maleng, Ahao/Ahlao, Tha Vung languages (present in Laos), 13 languages left are all present in Vietnam. It is worth noting that there is a significant difference in the number of native speakers of each language belonging to the Vietic group in Vietnam. Vietnamese, which is the national language of Vietnam, is the language with a largest number, over 82 million; the language with the second largest number of speakers is Muong, with nearly 1.5 million people. For the remaining languages, including Kri Phoong, Ma Lieng, Ruc, the number of speakers is much smaller, a total of only about 98,000 people. Other than Vietnamese and Muong, the Vietic languages spoken by minority groups have no orthographies. A recent study has shown that, among the Vietic languages in Vietnam, Li Ha, Arem, May, Ruc, Sach, Ma Lieng, Kri Phoong are languages in danger of extinction (Dương, Nguyễn, Nguyễn, & Tạ 2022).

According to the List of Ethnic Groups in Vietnam (issued under Decision No. 121-TCTK/PPCĐ dated March 2, 1979), the Kri Phoong, Ma Lieng, Ruc, along with the May, Sach, and Arem people are considered to be local groups of the Chut ethnic group (Ủy ban Dân tộc - Tổng cục Thống kê [Ethnic Committee - General Statistics Office] 2020). These groups reside in Ha Tinh and Quang Binh provinces of north-central Vietnam.

1 First author
2 Corresponding author

According to our 2019 study in Vietnam, the populations and locations of the three main ethnolinguistic groups are as follows. The Kri Phoong local group has over 50 people who reside in Huong Vinh commune, Huong Khe district, Ha Tinh province. Besides the self-designation "Kri Phoong", this local group is also known as Khạ Phoọng and Coi (or Coi Giang). The Ma Lieng local group has nearly 1,200 people residing in two provinces: Quang Binh and Ha Tinh. In Quang Binh province, the Ma Lieng people reside in Trọng Hoa commune, Minh Hoa district, as well as Thanh Hoa and Lam Hoa communes, Tuyen Hoa district. In Ha Tinh province, the Ma Lieng people reside in Huong Lien commune, Huong Khe district (Viện Dân Tộc Học [Institute of Ethnology] 2015). The Ruc group has about 440 people, primarily residing in Thuong Hoa commune and a small number in Yen Hoa commune, Minh Hoa district, Quang Binh province.

In these localities, the Kri Phoong and Ma Lieng people commonly reside in separate villages, while only the Ruc people in Thuong Hoa commune live in mixed communities with the Sach people, another local group of the same Chut ethnic group. At the administrative unit of the commune level, the Kri Phoong, Ma Lieng, and Ruc people live in close proximity to the Kinh (i.e., Vietnamese) people, as well as the Khua and May people. It is worth noting that the villages where the Kri Phoong, Ma Lieng, and Ruc people are located are in high mountainous areas with rugged terrain, making transportation extremely difficult. As a result, the interaction and exchange with the outside society are highly limited for these groups.

In the mid-to late-20th century, the Kri Phoong, Ma Lieng, and Ruc people practiced slash-and-burn agriculture, farming, livestock rearing, and hunting and gathering. Their houses were temporary huts or caves used as dwellings. Nowadays, with the assistance of various levels of government, in addition to traditional farming practices, they have learned to cultivate wet rice and utilize the pulling power of buffaloes and cows for plowing and tilling. They have also adopted the use of fertilizers in agriculture. Furthermore, community members now have houses with tiled roofs or fiber-cement roofs.

In study of languages belonging to the Austroasiatic family in general, and the Vietic group in particular, the Kri Phoong, Ma Lieng, and Ruc languages have garnered significant attention from linguists. However, most of this attention has been focused on the description of linguistic structures (Nguyễn 1993) or examining the linguistic status and the position of Kri Phoong, Ma Lieng, and Ruc languages in genetic classification (Ferlus 1996; Đoàn 2002; Nguyễn, Nguyễn, & Tạ 2013; Sidwell and Alves 2021; Nguyễn, Phan, & Bùi 2022). From a sociolinguistic perspective, the most relevant information about the Kri Phoong, Ma Lieng, and Ruc languages may be found in the recent publication *Endangered Languages in Vietnam: Theoretical and Practical Issues* (Dương, Nguyễn, Nguyễn, & Tạ 2022). However, due to the general nature of the publication, specific information about the sociolinguistic situation of the Kri Phoong, Ma Lieng, and Ruc people, especially the Kri Phoong, has not been addressed. Our article can be considered as follow-up work to further explore this research topic.

The purpose of the article is to clarify the conscious awareness of language as well as the actual language usage and language preferences, particularly the use of mother tongue, among the Kri Phoong, Ma Lieng, and Ruc ethnolinguistic groups. In Vietnam, these are local groups with very small populations, and there is a significant risk of their mother tongues becoming extinct. Therefore, the article aims to achieve two objectives: (1) to provide additional sociolinguistic data for scientists in their ongoing work of verifying the linguistic components within the Vietic language group and (2) to raise awareness about negative trends in language usage and propose necessary measures to prevent the potential extinction of the Kri Phoong, Ma Lieng, and Ruc languages.

2 Research methodology

To gather information on the awareness of language consciousness, language usage, language preferences, and other relevant details concerning the Kri Phoong, Ma Lieng, and Ruc people, we employed a combination of informant linguistic field methods and sociolinguistic survey methods. The procedures involved in this study included conducting interviews through questionnaires, conducting in-depth interviews, taking photographs, collecting on-site data, and observing communication situations. The questionnaire was designed to include 33 different pieces of information, including general information about collaborators; information related to names and ethnic consciousness; and

information related to the situation and desire for language use. Following this questionnaire, during fieldwork in the localities, the investigators directly interviewed the survey participants and recorded their responses on the printed questionnaire sheets (see the Appendix).

The data used in the article was collected in August and September 2019, including the data collected from survey questionnaires conducted with 34 Kri Phoong people residing in Ban Giang, Huong Vinh commune, Huong Khe district, Ha Tinh province (34% male and 66% female); 249 Ma Lieng people residing in Ke village and Cao village in Lam Hoa commune, Tuyen Hoa district, Quang Binh province (57.4% male and 42.6% female); and 246 Ruc people residing in On village and Mo O O O village (Mò O Ồ Ồ in Vietnamese) in Thuong Hoa commune, Minh Hoa district, Quang Binh province (43.9% male and 56.1% female). In terms of age, the categatories and percentages are as follows: people born after 1982 (40% of Kri Phoong, 51.8% of Ma Lieng, 59.8% of Ruc), people born from 1958 to 1982 (48% of Kri Phoong, 45% of Ma Lieng, 32.8% of Ruc), people born before 1958 (12% of Kri Phoong, 3.2% of Ma Lieng, 7.4% of Ruc). The survey results were assembled and processed with the SPSS (Statistical Package for the Social Sciences), a specialized software for data statistics in social science research.

3 The survey results

3.1. The survey results regarding the conscious awareness of language among the Kri Phoong, Ma Lieng, and Ruc people

Conscious awareness of language is the self-awareness of native speakers about the languages they use on a daily basis. To understand this aspect of the Kri Phoong, Ma Lieng, and Ruc people, we included the following question in our survey questionnaire: *What is the name of the daily language you use?* The survey results are shown in Table 1.

Table 1: *The names of self-identified languages used by the Kri Phoong, Ma Lieng, and Ruc people*

Self-identified language / **Local groups**	**The Ruc language**	**The Ma Lieng language**	**The Kri Phoong language**	**The Chut language**
Kri Phoong			31/34 = 91.2%	3/34 = 8.8 %
Ma Lieng		244/249 = 98%		5/249 = 2%
Ruc	202/246 = 82.1%			44/246 = 17.9%

According to Vietnamese ethnologists, the local groups Kri Phoong, Ma Lieng, Ruc, May, Sach, Arem belong to the Chut ethnic group, so the languages of these local groups are only dialects of the "Chut" language and are not different languages. Also, they assume that one ethnic group is represented by one language. However, recent linguistic studies have shown that the number of ethnic groups and the number of languages in Vietnam are not identical: an ethnic group can speak more than one language, while two or three ethnic groups can speak the same language (Nguyễn, Nguyễn, & Tạ, 2013; Nguyễn, Phan, & Bùi 2022).

The survey results indicate that, despite being considered local groups of the Chut ethnic group, regarding language consciousness, the majority of Kri Phoong speakers (91.2%), Ma Lieng speakers (98%), and Ruc speakers (82.1%) perceive their languages as independent languages. Only a very small proportion of Ruc people (17.9%), Ma Lieng people (2%), and Kri Phoong people (8.8%) consider their languages a "Chut" language.

3.2. The survey results regarding the language use situation of the Kri Phoong, Ma Lieng, and Ruc people

To collect information on the language use situation of the Kri Phoong, Ma Lieng, and Ruc people, the first question posed is: *What languages do you speak*? The results are presented in Table 2.

The figures in Table 2 indicate that 100% of the Kri Phoong, Ma Lieng, and Ruc people in the study can speak their native language. In addition to their native languages, Vietnamese is the second most common language, with over eighty percent of respondents in all three groups. A small percentage of the Kri Phoong people can speak Lao (26.5%). Also, a very small percentage of the Ma Lieng people know the Sach language (1.6%) and the Khua language (12.9%). 9.3% of the Ruc people can speak the May language, 25.2% speak the Sach language, and 4.5% know the Khua language. Therefore, in reality, the Kri Phoong, Ma Lieng, and Ruc people belong to multilingual communities, with the bilingual status in their native languages and Vietnamese being predominant.

To further understand the role of languages in the current lives of the Kri Phoong, Ma Lieng, and Ruc people, in the survey questionnaire, we presented twelve different communication situations and asked them to indicate which language they would use in each situation. The collected information for each group is as shown in Tables 3, 4, and 5. Note that while most of the rows add up to 100%, some of them have different totals based on the number of respondents (e.g., "with Kinh people") or some respondents gave more than one answer (e.g., "with other minority groups").

Table 2: *Language spoken by the Kri Phoong, Ma Lieng, and Ruc people*

Languages / **Local groups**	**Kri Phoong**	**Ma Lieng**	**Ruc**	**Vietnamese**	**May**	**Sach**	**Khua**	**Lao**
Kri Phoong	34/34 = 100%			29/34 = 85.3%				9/34 = 26.5%
Ma Lieng		249/249 = 100%		215/249 = 86.3%		4/249 = 1.6%	32/249 = 12.9%	
Ruc			246/246 = 100%	212/246 = 86.2%	23/246 = 9.3%	62/246 = 25.2%	11/246 = 4.5%	

The information from Tables 3, 4, and 5 shows some common tendencies as follows.

(a) In the daily life of the Kri Phoong, Ma Lieng, and Ruc people, the native language of each local group and Vietnamese are used in every communication situation.

(b) In family communication between generations, in village interactions, and during certain cultural and religious activities, such as storytelling and religious rituals, the native languages of the Kri Phoong, Ma Lieng, and Ruc groups play a more prominent role than Vietnamese does. However, when communicating with other ethnic groups, including the Kinh people, during group singing and in community meetings at the village level, Vietnamese takes on a more prominent role compared to the Kri Phoong, Ma Lieng, and Ruc languages. For example, during group singing, 64.7% of Kri Phoong people, 73.1% of Ma Lieng people, and 78.0% of Ruc people state that they use Vietnamese.

(c) Other than the communication situations of storytelling and religious rituals, in the remaining communication scenarios, the proportion of native speakers using their native language is relatively low, not exceeding 43%. Particularly, in family communication, among the younger generations, the usage of native languages also tends to decrease. For example, among the Ruc people, the percentage of those saying they use the Ruc language to communicate with parents is 34.1%; 30.5% say they use them with spouses; and 17.5% say they use them with children.

(d) In most communicative situations, a significant proportion of the Kri Phoong, Ma Lieng, and Ruc people use both their native languages and Vietnamese to communicate. For example, when going to

the market, 85.3% of Kri Phoong people, 85.4% of Ma Lieng people, and 82.9% of Ruc people say that they use both Vietnamese and their native languages to exchange information.

Table 3: *Uses of languages in the lives of the Kri Phoong people*

Languages spoken / **Communication situations**	**Kri Phoong**	**Vietnamese**	**Both Kri Phoong and Vietnamese**	**Lao**
with parents	11/34 = 32.4%		23/34 = 67.6%	
with spouses	8/34 = 23.5%		26/34 = 76.5%	
with children	7/34 = 20.9%		27/34 = 79.1%	
with villagers	15/34 = 44.1%		19/34 = 55.9%	
with Kinh people		29/34 = 85.3%		
with other ethnic groups (not Kri Phoong and Kinh people)		29/34 = 85.3%		9/34 = 26.5%
storytelling	29/34 = 85.3%	2/34 = 5.9%	3/34 = 8.8%	
singing	5/34 = 14.7%	22/34 = 64.7%	7/34 = 20.6%	
religious rituals	34/34 = 100%			
going to the market	5/34 = 14.7%		29/34 = 85.3%	
at the meetings in villages	5/34 = 14.7%		29/34 = 85.3%	
at the meetings in communes	5/34 = 14.7%	29/34 = 85.3%		

Table 4: *Uses of languages in the lives of the Ma Lieng people*

Languages spoken / **Communication situations**	**Ma Lieng**	**Vietnamese**	**Both Ma Lieng and Vietnamese**
with parents	106/249 = 42.6%		143/249 = 57.4%
with spouses	84/249 = 33.7%		165/249 = 66.3%
with children	67/249 = 29.9%		182/249 = 73.1%
with villagers	68/249 = 27.3%		181/249 = 72.7%
with Kinh people		215/249 = 86.3%	
with other ethnic groups (not Ma Lieng and Kinh people)	34/249 = 13.7%	215/249 = 86.3%	
storytelling	222/249 = 89.2%	27/249 = 10.8%	
singing	67/249 = 26.9%	182/249 = 73.1%	
religious rituals	247/249 = 92.2%	2/249 = 0.8%	
going to the market	37/249 = 14.6%		212/249 = 85.4%
at the meetings in villages	80/249 = 32.1%		169/249 = 67.9%
at the meetings in communes	34/249 = 13.7%	215/249 = 86.3%	

Table 5: *Uses of languages in the lives of the Ruc people*

Languages spoken / **Communication situations**	**Ruc**	**Vietnamese**	**Both Ruc and Vietnamese**
with parents	84/246 = 34.1%		162/246 = 65.9%
with spouses	75/246 = 30.5%		171/246 = 69.5%
with children	43/246 = 17.5%		203/246 = 82.5%
with villagers	64/246 = 26.0%		182/246 = 74.0%
with Kinh people		212/246 = 86.2%	
with other ethnic groups (not Ruc and Kinh people)	34/246 = 13.8%	212/246 = 86.2%	
storytelling	179/246 = 72.8%	67/246 = 27.2%	
singing	54/246 = 22.0%	192/246 = 78.0%	
religious rituals	246/246 = 100%		
going to the market	42/246 = 17.1%		204/246 = 82.9%
at the meetings in villages	83/246 = 43.7%		163/246 = 66.3%
at the meetings in communes	34/246 = 13.8%	212/246 = 86.2%	

In addition to collecting information through the questionnaire as presented above, we also conducted in-depth interviews with some village leaders about the current Vietnamese language use in the daily lives of the Kri Phoong, Ma Lieng, and Ruc people. The interviewees included Ho Van Son, born in 1957 (the Kri Phoong people in Giang village); Pham Thi Lam, born in 1964 (the Ma Lieng people in Cao village); Cao Xuan Long, born in 1994 (the Ruc people in Mo O O O village). The question we asked was: *Could you tell us about the current situation of Vietnamese language use among people in your village?*

The respondents' answers received are summarized below.

(a) Ho Van Son: In the past, not many people knew Vietnamese, and the villagers mainly spoke Kri Phoong to each other. Over the last 20 years, the roads have become more convenient, and there has been more interaction with the Kinh people, especially since most Kri Phoong children have gone to school, so the number of people who know Vietnamese has increased. In recent years, in the Kri Phoong community, all young people know Vietnamese. Now, in young families, parents and children also speak Vietnamese to each other. They use Vietnamese even more than their mother tongue. Knowing Vietnamese makes it easier to find a job.

(b) Pham Thi Lam: Except for a few elderly Ma Lieng people who cannot speak Vietnamese, most middle-aged people and younger can speak Vietnamese. Now all children go to school. Now, when talking to people who are not Ma Lieng, everyone speaks Vietnamese. In families with many young people, they also speak Vietnamese, but also sometimes speak Ma Lieng.

(c) Cao Xuan Long: Nowadays, all young Ruc people speak Vietnamese well because they go to school, work and interact a lot with the Kinh people. Only the elderly can understand but not speak Vietnamese. Knowing Vietnamese helps us not feel embarrassed when going out, and it is easier to find a job. That is why at home, people speak Vietnamese more than Ruc.

The information above shows a general trend. In the daily communication of the Kri Phoong, Ma Lieng, and Ruc people, the role of Vietnamese tends to overshadow their mother tongues.

3.3. The survey results about the language preference of the Kri Phoong, Ma Lieng, and Ruc people

To gather information about the language preferences of the Kri Phoong, Ma Lieng, and Ruc people, we presented two questions. The first question was: *In the following cases, which language do you think is most appropriate to use: daily notes (for example, recording your child's vaccination schedule, recording the list of people you plan to invite to your child's wedding, etc.); praying; broadcasting; printing books, newspapers, etc.; watching television; collecting and composing literary and artistic genres (collecting folk songs, proverbs, fairy tales; composing poems, songs, etc.); propagating and*

disseminating knowledge (knowledge of law, breed, cultivation, environmental sanitation, etc.); teaching and learning at school? The survey results are shown in Tables 6, 7, and 8.

Table 6: *Language preferences of the Kri Phoong people*

Suitable Language / **Communication Situations**	**Kri Phoong**	**Vietnamese**	**Both Kri Phoong and Vietnamese**
daily notes		34/34 = 100%	
religious rituals	34/34 = 100%		
broadcasting	9/34 = 26.5%		25/34 = 73.5%
printing books, newspapers…		25/34 = 73.5%	9/34 = 26.5%
television	9/34 = 26.5%		25/34 = 73.5%
collecting and creating literary and artistic works (stories, poems, songs)	7/34 = 20.6%	27/34 = 79.4%	
disseminating knowledge	18/34 = 52.9%		16/34 = 47.1%
teaching and learning at school (to transfer knowledge)		34/34 = 100%	

Table 7: *Language preferences of the Ma Lieng people*

Suitable Language / **Communication Situations**	**Ma Lieng**	**Vietnamese**	**both Ma Lieng and Vietnamese**
daily notes	3/249 = 1.2%	246/249 = 98.8%	
religious rituals	242/249 = 97.2%	7/249 = 2.8%	
Broadcasting	68/249 = 27.3%		181/249 = 72.7%
printing books, newspapers…		166/249 = 66.7%	83/249 = 33.3%
Television	68/249 = 27.3%		181/249 = 72.7%
collecting and creating literary and artistic works (stories, poems, songs)	60/249 = 24.1%	189/249 = 75.9%	
disseminating knowledge	52/249 = 20.9%		197/249 = 79.1%
teaching and learning at school (to transfer knowledge)		249/249 = 100%	

Table 8: *Language preferences of the Ruc people*

Suitable Language / **Communication Situations**	**Ruc**	**Vietnamese**	**Both Ruc and Vietnamese**
daily notes	14/246 = 5.7%	232/246 = 94.3%	
religious rituals	238/246 = 96.4%	8/246 = 3.6%	
Broadcasting	57/246 = 23.2%		189/246 = 76.8%
printing books, newspapers…	6/246 = 2.4%	162/246 = 65.9%	78/246 = 31.7%
Television	57/246 = 23.2%		189/246 = 76.8%
collecting and creating literary and artistic works (stories, poems, songs)	58/246 = 23.6%	188/246 = 76.4%	
disseminating knowledge	62/246 = 25.2%		184/246 = 74.8%
teaching and learning at school (to transfer knowledge)		246/246 = 100%	

The results from Tables 6, 7, and 8 show the following:
(a) During religious rituals, the majority of Kri Phoong people (100%), Ma Lieng people (97.2%), and Ruc people (96.4%) expressed a desire to use their native language.
(b) In the cases of daily notes, printing books, newspapers, collecting and creating literary and artistic works, and teaching and learning at school, the preference for using the native language among the Kri Phoong, Ma Lieng, and Ruc people is relatively low, below 30%; in contrast, the preference for using Vietnamese in these situations is significant, from 66.7% and above. In particular, in the context of teaching and learning at school, all three local groups agree that they use Vietnamese with a 100% agreement rate.
(c) In other communication situations, such as broadcasting, television, propaganda and knowledge dissemination, the majority of the Kri Phoong, Ma Lieng, and Ruc people wish that responsible agencies would use their mother language and Vietnamese at the same time, with a rate of 73.5% or higher.

The second question was: *In your opinion, is it necessary to teach your ethnic script?* The collected information is shown in Table 9.

***Table 9**: Interest in learning native language scripts among the Kri Phoong, Ma Lieng, and Ruc people*

Preference / **Local Groups**	**Yes**	**No**	**Difficult to answer**
Kri Phoong	31/34 = 91.2%	1/34 = 2.9%	2/34 = 5.9%
Ma Lieng	210/249 = 84.3%	25/249 = 10.0%	14/249 = 5.6%
Ruc	196/246 = 79.7%	37/246 = 15.0%	13/246 = 5.3%

The information in Table 9 shows that the majority of Kri Phoong people (91.2%), Ma Lieng people (84.3%), and Ruc people (79.7%) express a desire to be able to write in their own languages if such writing systems were available. The percentage of respondents who answered "not necessary to learn" or "difficult to answer" is very small, below 15%.

Although Kri Phoong, Ma Lieng, Ruc are unwritten languages, the information in table 9 shows that the majority of Kri Phoong (91.2%), Ma Lieng (84.3%), and Ruc (79.7%) people want to learn their mother language in writing. The percentage of people who would not be interested in learning to write in their group's language or who felt it was difficult to answer was small, less than 15%.

4 Discussion

After analyzing and considering the information presented above, we identified several issues that require further discussion and deliberation.

Firstly, according to the classification of ethnolinguistic groups in Vietnam, the Kri Phoong, Ma Lieng, Ruc people along with the May, Sach, and Arem people, are considered part of an assumed Chut language. However, the data in Table 1 shows that according to the Kri Phoong, Ma Lieng, and Ruc people, the idea of a "Chut" language is not generally part of their perception. Instead, they mostly see the Kri Phoong, Ma Lieng, and Ruc languages as separate languages. This information supports the opinions of many other researchers (Ferlus 1996; Đoàn 2002; Nguyễn & Nguyễn 2013; Sidwell & Alves 2021; Nguyễn, Phan, & Bùi 2022, etc.).

Secondly, in terms of function, the Kri Phoong, Ma Lieng, and Ruc languages are primarily used in specific communication contexts inside their local community (e.g., within the family, in the village, storytelling, religious rituals, etc.). In other communication contexts (e.g., when singing, communicating with Kinh people, communicating with other ethnic groups, communicating at the market, in commune meetings, etc.), the Kri Phoong, Ma Lieng, and Ruc people predominantly use Vietnamese. Our in-depth interviews and observations also indicate that even in family and village

communication, the usage of Vietnamese by the Kri Phoong, Ma Lieng, and Ruc people has increased over time. The reasons for this situation can be attributed to the role of Vietnamese: starting from kindergarten level, children of ethnic minorities have learned Vietnamese.

Regarding the first aspect, the Kri Phoong, Ma Lieng, and Ruc languages face several disadvantages: (a) the numbers of speakers are very low (Kri Phoong has about 50 people, Ruc has over 400 people, and Ma Lieng has under 1,200 people); (b) these languages do not have writing systems yet, they are not taught in schools, and they are not broadcast on radio or television; (c) due to the demands of modern life (e.g., the Kri Phoong, Ma Lieng, and Ruc people must know Vietnamese to have the opportunity to find jobs with better income) and the decreasing interest of younger generations in their native languages; (d) conservation policies have not achieved the desired results.

Regarding the second aspect, in Vietnam, Vietnamese is the national language and widely used, and it is mandatory in schools, government agencies, and all forms of mass media. Consequently, Vietnamese plays a dominant role in the Kri Phoong, Ma Lieng, and Ruc communities. Clearly, this makes it difficult to maintain the use of Kri Phoong, Ma Lieng, and Ruc languages in the future.

Thirdly, regarding language preference, although the specific percentages vary, the majority of Kri Phoong, Ma Lieng, and Ruc people prefer to use both their native languages and Vietnamese in different areas of life. In the face of the dominance of Vietnamese, this is a positive sign. The Kri Phoong, Ma Lieng, and Ruc people recognize the role of Vietnamese but still have a desire to maintain their own languages. This desire is further evident in the high percentage of people expressing a desire to learn their native languages, ranging from 79.7% to 91.2%. This is a positive factor in preserving and promoting the role of the Kri Phoong, Ma Lieng, and Ruc languages today.

Fourthly, based on the nine criteria of UNESCO (2003) to assess the vitality of languages and on the specific assessment formula for languages in Vietnam of Dương, Nguyễn, Nguyễn, Tạ 2022, we conducted an evaluation of the endangerment level for the Kri Phoong, Ma Lieng, and Ruc languages. The results indicate that the Kri Phoong, Ma Lieng, and Ruc languages are languages with a high risk of endangerment (Definitively endangered) (Level 3). These results are more severe than opinions that consider the Ma Lieng and Ruc languages as severely endangered (Level 2) indigenous languages (Trần 2018; Dương, Nguyễn, Nguyễn, & Tạ 2022).

5 Conclusion

In the current trend of integration, similar to other countries with diverse multilingual ethnic groups, the risk of endangerment for languages of ethnic minorities in Vietnam is significant. As languages and dialects with a high risk of endangerment, in order to preserve the important role of the Kri Phoong, Ma Lieng, and Ruc languages in their communities, we hope that responsible authorities at various levels and sectors consider the following points:

- Raise awareness about the importance of native languages within each community so that ethnolinguistic minorities are more conscious of using their own languages.
- Encourage and motivate Kri Phoong, Ma Lieng, and Ruc speakers to use their native languages in family activities and community cultural events in villages and hamlets.
- Depending on specific local conditions, in addition to Vietnamese-language radio and television programs, there should be programs in Kri Phoong, Ma Lieng, and Ruc languages.

To prevent language loss, it is necessary to have comprehensive research programs for less-studied languages like Kri Phoong and Ma Lieng. Clearly, besides learning the national language (Vietnamese), the aspiration the interviewees to learn to read and write in Kri Phoong, Ma Lieng, and Ruc reminds responsible agencies to pay more attention to building writing and to introduce these languages into school instruction.

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Appendix

(The following table is the questionnaire that we gave to the respondents. It is a translation of the original Vietnamese form.)

Investigator:			Date month year 2019
At: Commune	District	Province	
SURVEY FORM ON SELF-AWARENESS AND LANGUAGE USAGE			

1. Full name of respondent: **2. Year of birth**:

3. Gender: male ☐ female: ☐

4**. Place of birth:** village: commune:

district: province:

5. Current residence: village: commune:

district: province:

6. Completed grade:

not attending school ☐ attending literacy class ☐ 1-3 ☐ 4-5 ☐ 6-9 ☐ 10-12 ☐ intermediate ☐
college ☐ university ☐ postgraduate ☐

7. Occupation:

farmer ☐ housewife ☐ retired ☐ worker ☐ student ☐
public employee ☐ armed forces/military ☐ other ☐

8. Your ethnic name is recorded in the following documents[3]:

Type of document	Ethnic name recorded	Other (Specify)
ID card		
Household registration		
School records		
License		

- What do your call your ethnic group [4]:

13. What is the language you use every day?

14.

....

17.

(*From sentences 14 to 17, the information not related to the article*).

18. For your ethnic group in other regions, which region do you think speaks the same language as your ethnic group here?

No	Other regions (commune, district, province, country)	are the same	different	difficult to answer
1				
2				
3				
4				
5				
6				
7				

19.

....

28.

(*From sentences 19 to 28, the information is not related to the article*).

[3] Record the exact spelling of your ethnic name on your ID card, Household registration, license

[4] Recorded in international phonetic transcription or National language phonetic transcription

29. Which languages do you know?

Language	Listening, speaking fluently listening	speaking simple sentences (greetings, names...)	can listen, cannot speak	cannot speak	know writing
mother tongue					
Vietnamese					
language...					
language...					
language...					

30. What languages do you usually use when talking to:

Languages spoken / **Communication situations**	your ethnic language	Vietnamese	language...	language
with parents				
with spouses				
with children				
with villagers				
with Kinh people				
with other ethnic groups				

31. What languages do you usually use when...

Suitable Language / **Communication Situations**	your ethnic language	Vietnamese	language...	language...
language...				
storytelling				
singing				
religious rituals				
going to the market				
at the meetings in villages				

32. For your ethnic group, which languages and scripts are appropriate in the following situations:

Context of using the language	your ethnic language	Vietnamese	language...	language...
daily notes				
religious rituals				
broadcasting				
printing books, newspapers…				
television				

Context of using the language	your ethnic language	Vietnamese	language...	language...
daily notes				
religious rituals				
broadcasting				
printing books, newspapers…				
television				
collecting and creating literary and artistic works (stories, poems, songs)				
disseminating knowledge				
teaching and learning at school (to transfer knowledge)				

33. Is it necessary to teach our ethnic language?

Yes ☐ No ☐ difficult to answer ☐

Reason: ……