

VERBALIZING LEXICAL AFFIXES IN TAKITUDUH BUNUN

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Abstract. This paper discusses the grammatical and semantic properties of verbalizing lexical affixes in Takituduh Bunun (Austronesian, Taiwan), arguing that these lexical affixes are the overt realization of the category-assigning head *v*, while the nominal stems of these lexical prefixes are reduced *n*Ps, rather than full DPs. The paper describes the argument structure and transitivity pattern of these verbalizing lexical affixes and the modifiability and referentiality of the nominal stems. The findings presented here highlight need for more detailed empirical investigations into the topic across languages and for typological work into the structure of verbalizing lexical affixes.

Keywords: Bunun, Austronesian, Lexical Affixes, Denominal Verbs, Verbalization.

1. INTRODUCTION

This paper constitutes a first attempt at describing lexical affixes attached to nominal stems in Takituduh Bunun (Austronesian, Taiwan), focusing on the grammatical and semantic properties of both the lexical affixes and the nominal stems. An illustration of the structure is given in (1) below, where the lexical prefix *tun-* is attached to the nominal stem *otovai* to derive the morphologically complex verb meaning ‘to drive (a) motor cycle’. Compare this to example (2), where the equivalent semantic content is encoded using the lexical verb *unting* instead, and the nominal stem of (2) is instead an independent constituent preceded by the case marker *=s*.

- (1) *tun-otovai ca tama*
DRIVE-motorcycle NOM father
‘Father drives a motorcycle.’
- (2) *ma-unting ca tama=s otovai*
AV-drive NOM father=OBL motorcycle
‘Father drives a motorcycle’

There has been considerable interest in the category of lexical affixes, having been extensively discussed from both functional (Mithun, 1997) and formal (Wiltschko, 2009)

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perspectives, as it challenges the traditional notion that affixation is limited to grammatical categories. While lexical affixes have been discussed extensively in North-American languages (Gerdtts & Marlett, 2008), they are also attested across several of the Austronesian languages spoken in Taiwan (Adelaar, 2004; Tsukida & Zeitoun, 2023), beyond the Bunun variety discussed here. In line with proposals developed by Johns (2007, 2009) and Barrie & Mathieu (2016), I propose that the kind of lexical prefixes illustrated above in Takituduh Bunun is the overt realization of a category-assigning head v , and that the nominal stems that act as hosts for these lexical prefixes are limited to reduced nP . Several of the grammatical and semantic properties follow from this proposal, including the limited inventory of lexical prefixes, their limited semantic content and the fact that the semantic content encoded by lexical prefixes is highly dependent on the semantic content of the nominal stem. Similarly, the fact that the nominal stem is visible in the broader syntactic context, while not being available for syntactic modification, also follows from this proposal.

A few notes on terminology and the structure of the paper are in order: I refer to the lexical prefixes as verbalizing lexical affixes (VLA) throughout the article. To refer to the nominal stem that acts as host of the lexical prefixes, I use the term nominal stem. To refer to the complex stem consisting of a lexical prefix and a nominal stem, I use the term denominal verb. The remainder of the paper is structured as follows: In section 2, I outline the necessary background of this paper, including methodology, previous research on lexical affixes and the theoretical framework adopted in the paper. Section 3 presents the primary findings of the papers, divided into one subsection focusing on the basic grammatical properties of denominal verbs (3.1), one subsection discussing transitivity and argument structure (3.2), and one subsection discussing the transparency and structure of the nominal stem (3.3). I end the paper with a discussion and prospects for future research in section 4.

2. BACKGROUND

2.1. Language Background & Data Collection

Bunun is divided into 5 extant dialects, which exhibit varying degrees of mutual intelligibility (De Busser, 2009; Huang & Shih, 2018; Li, 2018). The five dialects are Isbukun (Southern), Takivatan and Takbanuaz (Central), Takituduh and Takibakha (Northern), with the Central and Northern branches forming a North-Central branch to the excluding of the Southern branch. Bunun is spoken primarily in the mountainous central and eastern parts of Taiwan. There are no official figures for number of speakers so all number remain conjectural, however, all varieties of Bunun are considered to be endangered as the language is being increasingly replaced by Mandarin Chinese.

Takituduh Bunun, like all varieties of Bunun, is a verb-initial language and arguments are preceded by case markers, although these are often omitted. While there is some variation in the linear order of arguments, VSO appears to be the default word order in Takituduh Bunun. Like most other Austronesian languages spoken in Taiwan, also known to as Formosan languages, Takituduh Bunun exhibits the Austronesian voice system. Roughly speaking, the thematic role of the clause pivot, marked with the nominative case marker, broadly correlates with the voice marking on the verb, which obligatorily takes one of (usually four) voice markers, namely Actor, Patient, Locative and Circumstantial Voice

(see Chen & McDonnell, 2019 for a recent overview and discussion of different proposed analyses). These patterns are illustrated in examples (3)-(6) below, with each example illustrating a different voice alternation. In (3), the verb has the Actor Voice (AV) prefix, and the nominative argument of the clause is the agent. In (4), the verb has the Patient Voice (PV) suffix, and the nominative argument of the clause is the patient. In (5), the verb has the Locative Voice (LV) suffix, and the nominative argument of the clause is the location. In (6), the verb has the Circumstantial Voice (CV) prefix, and the nominative argument of the clause is the instrument.

- (3) ma-kal'ing azak qasu tulkuk
 AV-stir.fry 1s.NOM meat chicken
 'I stir-fry chicken meat.
- (4) kal'ing-un zaku ca qasu tulkuk
 stir.fry-PV 1s.ERG NOM meat chicken
 'I stir-fry the chicken meat.'
 AV-stir.fry 1s.NOM meat chicken
 'I stir-fry chicken meat.
- (5) kal'ing-an zaku qasu tulkuk ca tipin
 stir.fry-LV 1s.ERG meat chicken NOM oil
 'I stir-fry the chicken meat in the wok.
- (6) is-kal'ing zaku qasu tulkuk ca simal
 CV-stir.fry 1s.ERG meat chicken NOM oil
 'I stir-fry the chicken meat with oil' (Bogren Svensson, 2023, 165f)

The data presented here is based on original fieldwork conducted by the author. The data was collected in the village of Qatu/Zhongzheng, Nantou County, Central Taiwan together with six native speakers of Takituduh Bunun. The fieldwork was conducted during several visits to the village in 2024 and 2025, and the sessions were conducted in the homes of the native speakers. The native speakers that participated were between 65 and 85 years old, and data collection was done during shorter session, around 40-60 minutes per session, often meeting several times per week. I relied on a variety of methods for collecting the linguistic data, including translation elicitation, acceptability judgements, visual stimulus and spoken narratives. The audio was recorded and then later transcribed.

2.2. Lexical Affixation

Within the category of lexical affixes (see Sadock, 1986, 1986 and Mithun, 1986, 1997 for discussion, and Bischoff, 2011 and Ikonnikova & Kalinin, 2024 for empirical overviews) there is a type of affixes that take a nominal stem and return a verbal stem, often referred to as denominal verb constructions (Gerds & Marlett, 2008) or incorporation (Sadock, 1980, 1986), among other. These structures can be distinguished from noun incorporation on formal grounds, where the verbal element cannot occur independently, in contrast to noun incorporation, where the incorporating verb can appear as an independent constituent, in addition to together with an incorporated nominal. This pattern is illustrated below in Huauhtla Nahuatl (Uto-Aztecan), where the lexical verb *kwa* can appear independently, as in (7), and together with an incorporated nominal (*naka*), as illustrated in (8).

- (7) askeman ti-'-kwa nakatl
 never 2s-3s-eat meat
 'You never eat meat.'
- (8) na' ipanima ni-naka-kwa
 1s always 1s-meat-eat
 'I eat it (meat) all the time.' Huauhtla Nahuatl (Merlan, 1976; 185)

This pattern stands in contrast to the structures containing lexical affixes discussed here. The difference is illustrated with the Halkomelem (Salishan) examples below, where the lexical affix *tx^w* must attach directly to the nominal stem (9), and it cannot appear as an independent verb (10). Compare this to the structure in (11), which contains an independent lexical verb that encodes the same semantic content.

- (9) ni? cən tx^w-səplil.
 AUX 1.SUB VBL-bread
 'I bought bread'.
- (10) *ni? cən tx^w-ət k^w səplil.
 AUX 1.SUB buy-TR DET bread
 'I bought some bread'.
- (11) ni? cən ?iləq-ət k^w səplil.
 AUX 1s.SUB buy-TR DET bread
 'I bought some bread' (Gerdtts & Marlett, 2008; 411)

VLA are attested in several language families, including Uto-Aztecan (Haugen, 2008), Inuit-Yupik-Unangan (Bergsland, 1997; Fortescue, 1983), Na-Dene (De Reuse, 2008), Algic (Barrie & Mathieu, 2016) Salishan (Gerdtts & Hukari, 2008), Wakashan (Stonham, 2008), Chukotka-Kamchatkan (Vinyar et al., 2017) as well as language isolate Seri (Marlett, 2008), to mention a few beyond the Austronesian language family discussed here. There is considerable variation among the different languages, and common topics of variation include number of lexical affixes, semantic content of the lexical affixes, whether or not nominal modifiers are possible, and the relevance of VLA for information structure, including topics such as referentiality and backgrounding (Gerdtts & Marlett, 2008).

Lexical affixes are attested in several Formosan languages, including Bunun, Tsou, Siraya and Saisiyat (Adelaar, 2004; Chang, 2009; Nojima, 1996; Zeitoun & Chu, 2015), to mention a few, and some lexical affixes have proposed reconstructed for Proto-Austronesian (Tsukida & Zeitoun, 2023). Note that this category also include lexical affixes attached to verbal stems as well as those attached to auxiliary verb stems, the latter often referred to as anticipatory sequences (Adelaar, 2004). While the topic of lexical affixes in Formosan languages has been touched upon in several reference grammars are explored in more detail dedicated research articles, much work remains to be done, both with regards to describing the semantic and grammatical patterns in individual language varieties and comparative work.

2.3. Distributed Morphology and Lexical Roots

In this paper, I will follow the basic assumptions within Distributed Morphology (DM), (Halle, 1997; Halle & Marantz, 1992, 1994; Marantz, 1997). It is a realizationalist

framework where both morphological and syntactic structures are generated within Narrow Syntax, so the presyntactic lexicon that Narrow Syntax operate upon does not consist of words, but grammatical items (“feature bundles” in DM terminology) and lexical roots. A crucial assumption that I follow here is that lexical roots are not assigned a lexical category in the pre-syntactic lexicon, but are assigned a lexical category during the syntactic derivation by merging with a category-assigning head (e.g. *n*, *v*; see Embick, 2021 and Harley, 2014 and responses in the same volume for discussions on the role and nature of lexical roots in DM). Once this morphosyntactic structure has been generated, it is sent to the interfaces for semantic interpretation (Conceptual-Intentional Interface) and phonological insertion (Sensory-Motor Interface). As far as the hierarchical syntactic structure is concerned, it is predicted to be clear parallels between the structure of the verb phrase (in the sense of the verb and its internal arguments), noun incorporation and VLA (cf. Hale & Keyser, 2002; Sadock, 1980 for similar approaches).

Throughout this paper I argue that VLA are the overt realizations of category-assigning heads (*v*, in this case), and they are thus distinguished from lexical verbs by lacking lexical roots (lexical verbs at a minimum consisting of at least *v* and a lexical root), in line with proposals for VLA in Inuktitut (Johns, 2009) and Ojibwe (Barrie & Mathieu, 2016). The nominal stem consists of a lexical root and a category-assigning head *n*, and are thus nominal in the sense that the lexical root is assigned a lexical category in the syntactic derivation, but lack much of the material associated with full DPs. I develop this proposal throughout the paper, showing that several of the grammatical and semantic properties follow from this proposal.

3. VERBALIZING LEXICAL AFFIXES IN TAKITUDUH BUNUN

In this section, I will present the major findings of this paper. I begin by outlining some of the basic grammatical patterns for verbalizing lexical affixes and some key arguments for classifying them as such. As mentioned above, I argue that VLA are the overt realization of a category-licensing head *v*, which takes a lexical root and a nominal classifying head *n* (*nP*) as its complement. I develop this analysis throughout this section. In subsection 3.1, I outline the basic grammatical properties of VLA, while in subsection 3.2, I focus on the transitivity patterns of VLA, both with regards to the nominal stem, as well as the transitivity value of the denominal verb. In section 3.2, I discuss the grammatical properties of the nominal stem, showing that while they are transparent to the overall syntactic context, they are not open for modification.

3.1. Basic Grammatical Properties

Verbalizing lexical affixes cannot appear as independent constituents, in contrast to lexical verbs, nor can there be any material intervening between the lexical prefix and the nominal stem. This pattern is illustrated in (12) below, where the lexical prefix *tal-* is directly attached to the nominal stem *'ima*, and the denominal verb is followed by the nominative argument of the clause. Compare this to example (13), where a nominative pronoun intervenes between the nominal stem and the lexical prefix, and the structure is judged as ungrammatical. Example (14) contains a lexical verb encoding the same semantic content,

illustrating the contrast between VLA and lexical verbs in Takituduh Bunun. Note that the nominal stem in VLA cannot take any case marking. This can be taken as an argument that the nominal stems are not full DPs, since it would predict that they would be able to take case morphology, for instance the oblique case marker *is* in example (14) below.

- (12) tal-'ima ca uva'az di
 WASH-hand NOM child DEM
 'This child washes (his) hands.'
- (13) *tal- azak 'ima
 WASH- 1s.NOM hand
 Intended: 'I am washing my hands'
- (14) m-adanav ca uva'az is 'ima
 AV-wash NOM child OBL hand
 'The child washes (his) hands.'

VLA always stand in a complement relation to the nominal stem. This is clearly illustrated in the examples in (1) and (12) above, where the nominal stem has the same semantic relation to the VLA as the independent full argument DP has to the equivalent lexical verb, (a theme thematic role in these instances). There are other VLA (see appendix 1 for a list of VLA identified in Takituduh Bunun so far) that do not have semantic objects as nominal stems but where there still is a complementation relation between the lexical prefix and the nominal stem. This is illustrated in (15)–(17) below, with *malas-* 'speak' taking the language spoken as its nominal stem, *in-* 'become' taking a copula complement as its nominal stem, and *un-* 'go to' taking the Goal of the motion event as its nominal stem (see Bogren Svensson & Blomberg, 2026 for a discussion on the motion prefix *u(n)-* in Takituduh Bunun). Even though the internal structure of these denominal verbs cannot be described as transitive in the same sense as those in (1) and (12) above, there still appears to be a complementation relation between the prefix and the nominal stem. This is in line with the claim that the nominal stem ($n+\sqrt{}$) is merged as the complement of the lexical prefix (v).

- (15) malas-qayal 'speak Japanese'
 (16) m-in-laqda 'to become (a) stone'
 (17) m-un-kiukai 'to go to church'

VLA exhibit limited semantic content, and often the exact semantic interpretation is determined by the nominal stem. This pattern is particularly clear with the lexical prefix *ka-*, illustrated in (18)–(20) below. I gloss *ka-* simply as 'do', although the exact semantic interpretation is highly variable; when added to the stem *lac* 'fruit', the denominal verb means 'to bear fruit' (of plants), when added to the nominal stem *lumaq* 'house', the denominal verb means 'to build (a) house', and when added to the nominal stem *mali* 'ball', the denominal verb means 'to play (with a) ball'. Similar patterns are attested in Inuktitut (Johns, 2007, 2009) where the semantic interpretation of VLA is dependent on the lexical root, and this is taken as an argument in favor of these being the overt realization of category-assigning heads v , since they lack their own rich conceptual semantic content. The same argument can thus be extended to Takituduh Bunun as well, providing additional arguments for the analysis developed here.

- (18) ka-lac 'bear fruit'
 (19) ka-lumaq 'build house'
 (20) ka-mali 'play ball'

The VLA exhibit varying degrees of productivity. Some lexical prefixes appear to be able to attach to a rather large set of nominal stems; for instance, *tal-* 'to wash' appear on a large set of body parts (it is limited to washing the body) and *tin-* 'to find/harvest' appear on a large set of plants and fish nominal stems. In contrast, other lexical prefixes are rather limited; for instance, *ti-* 'to bring' appear to be limited to the nominal stem *muqus* 'bento box' and *kan-* 'to dig up' appears to be limited to the nominal stem *hutan* 'sweet potato'². Note that several of the VLA can also attach to interrogatives words to derive verbal interrogative structures. This is illustrated in (21) below, where the lexical prefix *un-* is attach to the interrogative 'where' to derive a denominal stem meaning 'go where', and in (22) where the lexical prefix *tun-* is attach to the interrogative 'what' to derive the denominal stem meaning 'drive/go by what'.

- (21) m-un-ica asu
 AV-MOT-where 2s.NOM
 'Where are you going?'
 (22) tun-ma'az nai m-un-taihuku
 DRIVE-what 3p AV-MOT-Taipei
 'How did they go to Taipei (lit. what did they drive/go by to go to Taipei)?'

In terms of the semantic meaning of VLA, Gerdts & Marlett (2008) note that while their empirical basis needs additional breadth, there appear to be considerable variation in terms of the semantic content encoded by VLA. However, in their sample, there are some recurring basic semantic properties. Some of the most recurring patterns are broadly related to POSSESSION and CREATION, for instance HAVE/MAKE/GET/DO, while GO TO is another common semantic meaning of VLA (Gerdts & Marlett, 2008; 413). VLA encoding semantic content within these categories are also attested in Takituduh Bunun, with *ka-* being able to encode 'make' (CREATION), and *mi-* 'to have' and *tin-* 'to find/harvest' both encoding semantic content under the category POSSESSION, while Takituduh Bunun also has affixes encoding motion. However, more typological work is needed before it is possible to establish any more general patterns for the semantic content of VLA and how Takituduh Bunun fits into a broader typology with regards to the semantic content in VLA.

3.2. Transitivity and Argument Structure

Most of the denominal verbs derived via verbalizing lexical affixes are intransitive, in the sense that they cannot take an internal argument in Actor Voice clauses. This restriction is illustrated with the lexical prefix *tal-* in (23) below, where the structure is regarded as ungrammatical if the intransitive denominal verb appears in a transitive clause structure (24). Compare this the denominal verbs in (25), which can take *quma* as the internal argument of

² Since this is a preliminary study, it is beyond the scope to determine both the full extent of their productivity and full inventory of VLA in Takituduh Bunun.

the denominal verb. Note that for all transitive denominal verbs found in Takituduh Bunun so far, internal arguments are optional and can thus be omitted.

- (23) tal-'ima asu
 WASH-hand 2s.NOM
 'You wash your hands.'
- (24) *tal-'ima azak su'un
 WASH-hand 1s.NOM 2s.ACC
 Intended: 'I washed your hands'
- (25) la-qanvang azak quma=cia
 VBL³-cow 1s.NOM field=3s
 'I plow his field.'

Denominal verbs can, like lexical verbs, be causativized and thus it is possible to derive transitive verbs from intransitive denominal stems. This pattern is illustrated in (26) below, where the denominal verb *tal'ima* is causativized, with the original nominative subject acting as a causee, and a causer is added to the structure, and with the nominative stem functioning as a theme argument. Since the verbs is in Patient Voice, the causee argument is the clause pivot (nominative argument).

- (26) pa-tal-'ima-un=ku asu
 CAU-WASH-hand-PV=1s.ERG 2s.NOM
 'I make you wash your hands.'

Denominal verbs exhibit the same four Austronesian voice forms as lexical verbs. Like lexical verbs, those that can take an internal argument in Actor Voice exhibit all four voice forms, while those that cannot take an internal argument only exhibit three voice forms (Actor, Locative and Circumstantial Voice). The different voice alternations are illustrated below. In (27), the denominal verb is in Patient Voice, and the nominative argument ('ground') has a patient thematic role. In (28), 'mountain' is extracted from the subordinate relative clause where the verb is marked in Locative Voice, so the head noun of the externally headed relative clause has a location thematic role. Finally, in (29), the nominative argument of the denominal verb marked in Circumstantial Voice is a clause topic ('hoe') and has an instrument thematic role.

- (27) ka-simuk-un nai ca dalaq aiza
 DO-cleared.slope-PV 3p NOM ground DEM
 'They cleared that ground (for growing crops).'
- (28) ica ca ludun kan-hutan-an su'u
 Where NOM mountain DIG-sweet.potato-LV 2s.ERG
 'Where is the mountain where you dug up sweet potatoes?'
- (29) maca kavung di ha, is-tin-bunbun zaku
 TOP hoe DEM TOP, CV-FIND-banana 1s.ERG
 'As for this hoe, I harvest bananas with it.'

³ To date, I have only found this prefix on the nominal stem *qanvang*, so I have yet to firmly establish its semantic content, which is why I leave it glossed as VBL.

The transitivity value of the denominal verb is determined by the lexical prefix, deriving either an intransitive or transitive verb. For transitive verbs, the internal argument is always optional, and they are always agent-preserving, meaning that the sole argument in the intransitive structure will act as an external argument in the transitive structure. No patient-preserving/unaccusative denominal verbs have been found. This is likely a consequence of the nominal stem always standing in a complement relation to the nominal stem, so any additional arguments in the intransitive structures will always be external argument. This stands in contrast to denominal verb structures in Nuuchahnulth (Wakashan), which exhibit prototypical unaccusative VLA like ‘die’ (Stonham, 2008). To date, no ditransitive denominal verbs have been found, although ditransitive structure can be derived using CV and LV structures. Again, this stands in contrast to denominal verb structures found in Kalaallisut (Inuit-Yupik-Unangan), where the VLA *-ler* ‘to give/provide’ exhibit a ditransitive patterns (Fortescue, 1984). These brief comparisons to Kalaallisut and Nuuchahnulth highlight the possibilities for cross-linguistic diversity and the need for additional typological studies into the topic.

3.3. Transparency and Structure of the Nominal Stem

In parallel to noun incorporation (Mithun, 1984), an often-discussed topic for verbalizing lexical affixes is the notion of referentiality. It has been noted across several languages, including in Seri (Marlett, 2008), Kalaallisut (Sadock, 1980), Halkomelem (Gerdtts & Marlett, 2008) and Chukchi (Vinyar et al., 2017), that VLA can introduce new referents via the nominal stem. Similar patterns are attested in Takituduh Bunun, where denominal verbs can introduce new referents in the nominal stem, which are subsequently referenced in the discourse. This is illustrated in (30) below, where the nominal stem of *tin*⁴ is introduced inside the denominal verb, and then it is co-referenced with the zero anaphora in the subsequent utterance, where the zero anaphor acts as the clause Pivot with the verb in Patient Voice. A similar pattern is illustrated in (31), where a new referent is introduced as the nominal stem (*lumaq*), which then is co-referenced as a zero anaphora in the subsequent clause, acting as the clause pivot of a stative verb. Note that this stands in contrast to the Type III Noun Incorporation, where noun incorporation is instead used for backgrounding (Merlan, 1976; Mithun, 1984). However, the relevance of VLA for information within Takituduh Bunun requires additional research.

- (30) tin-kan_k ca tama=nak,
 FIND-fish_k NOM father=1s.Poss
 na=kaun-un=ta Ø_k maca sanavan=in
 IRR=eat-PV=1p.INCL Ø_k SUBR evening=PRF
 ‘Father went to fish; We will eat (it/fish) tonight.’
- (31) tungan=in anai ka-lumaq_k,
 AV.complete=PRF 3p.NOM DO-house
 uutu nitu mantan ma-daing Ø_k
 but NEG very AV-big Ø_k
 ‘They finished building a house, but (it/the house) is not very big.’

⁴ Note that *tin-* covers a wide range of translations in English, including to search (for), to harvest, to find, to fish, etc., and I simply gloss it as FIND- here.

Another property that suggests the nominal stem is visible to the broader syntactic context is the fact that it can take narrow focus, as can be shown using basic Question-and-Answer structures. This is illustrated in (32) below, where the first clause is an interrogative clause, and the second clause is an answer to the question. Here, narrow focus is on the nominal stem (*taro*) to the exclusion of the verbal prefix, since it is part of the given information. The subscript and square brackets in the example below mark the target of narrow focus. This kind of pattern can be taken as additional evidence that the nominal stem internal of the denominal verb is visible in the broader syntactic context.

- (32) Ma'az ca kilim-un nai?
 what NOM search-PV 3p
 ‘What are they looking for?’
 Tin-[tai]_F nai
 FIND-[taro]_F 3p
 ‘They are searching for taro.’

A final piece of evidence comes from nominalizations, where the nominal stem is visible to the broader syntactic context after nominalization. This is illustrated in the examples below. In (33), the nominal stem is *hutan*, which acts as the host of the lexical prefix. This structure is subsequently nominalized via the perfective nominalizer *sin-*, and the agent of the event is realized as a possessive enclitic. This morphologically complex noun (*sinkanhutan*) can then act as the clause subject (preceded by the nominative case marker), and the verb *madia* acts as the clause predicate. Since the structure means that the sweet potatoes that I dug up are many, the nominal stem must be visible to the clause predicate. Put differently, nominal stems in denominal verbs can act as the head noun of nominalized internally headed relative clauses, showing that it is visible in the broader syntactic context. A similar example is given in (34), here the nominal stem *lumaq* takes the lexical prefix *ka-*, and the denominal verb is nominalized via the prefix *sin-*. This nominalized internally headed relative clause then acts as the subject of the stative verb *masqa*.

- (33) ma-dia ca sin-kan-hutan=nak
 AV-many NOM PRV.NMZ-DIG-sweet.potato=1s.Poss
 ‘The sweet potatoes that I dug up are many.’
 (34) masqa ca sin-ka-lumaq
 AV.big NOM PAT.NMZ-MAKE-house
 ‘The house that (they) built is big.’

The examples above show that the nominal stem is visible to the broader syntactic context. I take this as evidence in favor of concluding that the nominal stem contains a category-assigning functional head *n* in addition to a lexical root $\sqrt{\text{ }}$, since this would provide the nominal stem with the nominal properties that allows it to be visible to the broader syntactic context. Another important topic for research into the cross-linguistic variation for VLA is that of modification of the nominal stem. This is sometimes referred to as “stranding” (Gerdtts & Marlett, 2008), as the modifier is often left “stranded” as the nominal stem is part of the denominal verb. This kind of structure does not appear to be possible in Takituduh Bunun, as illustrated using demonstratives and possessors in the examples below. In (35),

a possessor, realized as an enclitic particle, is modifying the nominal stem, and the structure is ungrammatical. The same ungrammaticality is attested in (36), where the modifier is “stranded” as it is an independent possessive pronoun. Both examples show that modification of the nominal stem by possessive pronouns is not possible, regardless of whether they are cliticized to the denominal verb or stranded as independent constituents.

- (35) *ka-quma=cia azak
 DO-field=3s 1s.NOM
 Intended: ‘I plowed his field.’
- (36) *tal'-ima azak isu
 WASH-hand 1s.NOM 2s.Poss
 Intended ‘I washed your hands.’

The same pattern is attested for demonstratives, which likewise cannot modify the nominal stem. This is illustrated in (37) below, where the demonstratives *aiza* targets the nominal stem, and the structure is ungrammatical.

- (37) *cima ca ti-muqus aiza
 Who NOM BRING-bento.box DEM
 Intended: ‘Who brought that bento box?’

To allow for nominal modification in VLA in Takituduh Bunun, a structure referred to as “doubling” (Gerdts & Marlett, 2008) is instead used, where the same noun in the nominal stem is “doubled” as an object argument, and rendered more specific via modification. For instance, the meaning intended in example (35) above, ‘He plowed his field’, can be encoded by “doubling” the nominal stem as an independent constituent, which can be modified by the possessor. This structure is illustrated in (38) below, where the nominal stem *quma* is “doubled” and modified by the third person pronominal enclitic. The same structure can be utilized to allow for stative verbs to modify a referent denoted by the nominal stem, as illustrated in (39), where the nominal stem *lumaq* is “doubled” and modified by the phrase *mantan madaing*, preceding the nominal.

- (38) ka-quma azak quma=cia
 DO-field 1s.NOM field=3s
 ‘I plowed his field.’
- (39) ka-lumaq nai mantan ma-daing=a lumaq
 DO-house 3p very AV-big=MOD house
 ‘They build a very big house.’

As observed previously in the literature, this kind of pattern is reminiscent of Type IV noun incorporation (Mithun, 1984), also referred to as classifying noun incorporation, where a more generic noun is incorporated into the verb and a more specific noun of the same category is the object argument of the verb. However, Gerdts & Marlett (2008) note that it is necessary to distinguish between true doubling, as in the examples above where the same noun is doubled, and hyponymic doubling, where the nominal stem indicates a generic and

the doubled independent nominal provides an instantiation of a particular kind. Note that both the former (Haugen, 2008; Marlett, 2008) and the latter (Gerdt & Hukari, 2008) are attested for VLA. However, to date only true doubling has been attested in Takituduh Bunun, as illustrated in the examples above where the same noun is found both as the nominal stem and as the independent nominal.

As have been showed so far, it is not possible for demonstratives, possessive pronouns nor stative verbs to modify nominal stems in denominal verbs, where doubling instead is utilized to allow for such modifiers in structure containing VLA. However, compounding is possible with VLA, as the nominal stem can be a nominal compound. This pattern is illustrated in (40) below, where the nominal compound *laihlisapuz*, consisting of the head noun *laihliah* ‘vehicle’ and the modifying noun *sapuz* ‘fire’, is the nominal stem of the lexical prefix *tun-*. This shows that the nominal stem can be a compound noun, and is not limited to simplex roots. This structure contains an additional denominal verb, where a proper name is the nominal stem.

- (40) *tun-laihliah-sapuz* *anai* *m-un-taihuku*
 DRIVE-vehicle-fire 3p.NOM AV-GO-taipei
 ‘They take the train to Taipei.’

Taken together, the data presented here shows that the only kind of modification possible for the nominal stem is noun compounding, while modification from demonstratives, stative verbs (note that Takituduh Bunun, like other varieties of Bunun, lacks adjectives as a separate lexical class) and possessive pronouns/clitics is not possible. I propose that this limitation derives from the fact that the lexical prefix (the overt realization of *v*) only take a reduced *nP* as their complement. From this it follows that no modifiers are possible, since they would require a full DP to be present in the structure, and it also accounts for how the nominal stem is visible in the broader syntactic structure, since they are licensed as nominals.

The formal analysis of verbalizing lexical affixes in Takituduh Bunun is summarized in (41) below, compared to the equivalent transitive structure containing a lexical verb in (42). In the latter, two lexical roots are present, each independently licensed by different category-assigning heads (*v* and *n* for the verb and the noun, respectively; cf. Embick, 2021; Harley, 2014). In contrast, the structure containing lexical prefixes contain only one lexical root, licensed as a noun by the category-assigning head *n*, while the whole structure is licensed as a verb by the category-assigning head *v*. A second key difference is that the lexical verb takes a full DP as its complement, while VLA complements are limited to reduced *nPs*.

- (41) [*v* [*n-√*]]
 (42) [[*v-√*] [*DP*... [*n-√*]]]

The analysis of the lexical prefixes as the overt realization of *v* follows the proposals for VLA developed by Johns, (2007, 2009) and Barrie & Mathieu (2016) for Inuktitut and Ojibwe, respectively. This is intended to account for the limited inventory of such lexical affixes, their restricted semantic content, and the fact that their semantic interpretation is highly dependent upon the nominal stem. All these properties are found in Takituduh Bunun as well, showing that the same analysis can be adopted here. A second factor concerns the size of the complement of the verbal element. Here, I propose that the complement of VLA

in Takituduh Bunun are reduced *n*Ps, since modification of the nominal stem is not possible. However, the nominal stem is still referential and visible as a noun to the broader syntactic context, which is why it cannot be reduced to simply being a lexical root. The size of the complement of VLA seems to be an important source of cross-linguistic variation. For instance, Barrie & Mathieu (2016) argue that VLA in Ojibwe can take full DPs as their complement, while Johns (2007) argues that the nominal stems in denominal verbs in Inuktitut are smaller than DPs since they lack case, number and possessive markers, while still allowing modifier stranding. This shows that the size of the complement of VLA is subject to cross-linguistic variation, and that this source of variation yields considerable empirical variation across languages. This is reminiscent of the conclusions drawn by Barrie & Mathieu (2016) for noun incorporation more broadly, where the size of the nominal complement is likewise the source of much cross-linguistic variation.

4. DISCUSSION AND PROSPECTS FOR FUTURE RESEARCH

In this paper, I have discussed the semantic and grammatical properties of denominal verbs in Takituduh Bunun. I argue that verbalizing lexical affixes in Takituduh Bunun are the overt realization of the category-assigning head *v*, in line with proposals developed for VLA other languages (Barrie & Mathieu, 2016; Johns, 2007). I argue that the limited semantic content, limited inventory and the fact that the semantic interpretation is highly dependent on the nominal stem follow from this analysis. Furthermore, I propose that the complement of VLA consist of a reduced *n*P, from which it follows that the nominal stem is visible as a nominal in the broader syntactic context, while simultaneously preventing the nominal stem from being modified, as this is not possible in Takituduh Bunun.

This preliminary study highlights several avenues for future research. As was mentioned in the previous section, a source of considerable cross-linguistic variation is the size of the complement of VLA, where in Takituduh Bunun it is limited to a reduced *n*Ps, while in other languages (e.g. Ojibwe, Barrie & Mathieu, 2016) it can be full DPs. This implication calls for additional empirical studies into the structure of nominal stem in these kinds of denominal verbs, and for large-scale comparative typological studies. It is tempting to propose this as a basis for a formal typology. For instance, it would open up for research into variation into the types of stranded modifiers possible in in denominal verbs. Assuming the functional sequence for DPs proposed within cartography (Cinque, 2005, 2010; Rizzi & Cinque, 2016), it is predicted that if stranded demonstratives are possible, stranded adjectives should also be possible, since the latter is situated lower in the functional sequence. Furthermore, another possible avenue for future research is the correlation between modifiability of the nominal stem and the referentiality of the nominal stem. Since I proposed that the preferentiality of the nominal stem follows from the presence the category-assigning head *n*, one prediction would be that if a language allows for stranded modifiers with denominal verbs, nominal stems should be visible in the broader syntactic context. This follows from the fact that stranded modifiers require a larger syntactic structure than what is necessary for referentiality. This prediction is borne out in Chukchi (Vinyar *et al.*, 2017) and Takituduh Bunun, in which nominal stems can be referential but not modified, and in Kalaallisut (Sadock, 1980) and Seri (Marlett, 2008), in which nominal stems can be both referential and modified. However, more detailed descriptions of a larger set of languages must be conducted and compared before anything more than tentative suggestions can be proposed.

Another avenue for future research is the nature of the verbalizing lexical affixes themselves. In analogy with formal analyses of light verb constructions, and to differentiate them from prototypical noun incorporation, they are proposed to be the overt realization of functional items rather than also containing lexical roots. However, an important aspect that might not be fully captured with this approach is the considerable size of the inventory of VLA in some languages. While some languages contain a small inventory of VLA, as few as a single one, other languages contain a very large inventory, with Inuit languages (Dorais, 2010) and Nuuchahnulth (Stonham, 2008) containing well over 50 verbalizing lexical affixes. For reference, 16 VLAs have been established for Takituduh Bunun to date. To simply state that they are all the overt realization of *v* leaves much open for future developments. One promising avenue of future research would be to investigate whether these affixes can be analyzed as realizations of different “flavors” of *v* (Harley, 2017), with the possibility of individual lexical affixes being the overt realization of more than one *v*-head, thus allowing us to derive a larger inventory of lexical affixes without having to assume that they are the overt realization of lexical roots. However, it is beyond the scope of this paper to develop this kind of proposal so I leave it for future research.

To summarize, I have presented a first attempt at an analysis of verbalizing lexical prefixes in Takituduh Bunun, arguing that they are the overt realization of category-assigning syntactic head *v*. Furthermore, I argue that their complement is limited to a reduced *nP*, in contrast to taking a full DP as their complement. These proposals account for a large set of syntactic and semantic properties associated with VLA. Furthermore, I also place the findings within a broader typology of VLA, while also highlighting important avenues for both typological and theoretical developments.

Appendix 1: List of Takituduh Bunun Verbalizing Lexical Affixes

i- : be at
in- : become
ka- : do, make, build
ka- : reach
kan- : dig up (of plants)
kit- : ? (only attested in *kit-mata* ‘to stare’; *mata*: eye)
la- : ? (only attested in *la-qanvang* ‘to plough’; *qanvang*: cow)
malas- : speak
mi- : have
tal- : wash
tis- : give birth
ti- : bring
tin- : harvest, search, find
tu- : say
tun- : drive/go (by vehicle)
u- : go to

List of Abbreviations:

- 1: First Person
- 2: Second Person

3: Third Person
 ACC: Accusative Case
 AV: Actor Voice
 AUX: Auxiliary
 CAU: Causative
 CV: Circumstantial Voice
 DEM: Demonstratives
 DET: Determiner
 ERG: Ergative Case
 INCL: Inclusive
 LV: Locative Voice
 NEG: Negative
 NMZ: Nominalizer
 MOD: Modifier
 MOT: Motion
 NOM: Nominative Case
 OBL: Oblique Case
 p: Plural
 POSS: Possessive
 PRF: Perfect
 PRV: Perfective
 PV: Patient Voice
 s: Singular
 SUB: Subject
 SUBR: Subordinator
 VBL: Verbalizer

REFERENCES

- Adelaar, K.A., 2004, "The coming and going of "lexical prefixes" in Siraya", *Language and Linguistics*, 5, 2, 333–361.
- Barrie, M., E. Mathieu, 2016, "Noun incorporation and phrasal movement", *Natural Language & Linguistic Theory*, 34, 1, 1–51. <https://doi.org/10.1007/s11049-015-9296-6>
- Bergsland, K., 1997, *Aleut grammar*, University of Alaska, Alaska Native Language Center.
- Bischoff, S.T., 2011, „Lexical affixes, incorporation, and conflation: The case of Coeur d’Alene”, *Studia Linguistica*, 65, 1, 1–31.
- Bogren Svensson, V., 2023, *Manner Modifiers as Syntactic Heads* [PhD Thesis], Lund University.
- Chang, H.Y., 2009, "Adverbial verbs and adverbial compounds in Tsou: A syntactic analysis", *Oceanic Linguistics*, 439–476.
- Chen, V., B. McDonnell, 2019, "Western Austronesian voice", *Annual Review of Linguistics*, 5, 173–195.
- Cinque, G., 2005, "Deriving Greenberg’s Universal 20 and its exceptions", *Linguistic Inquiry*, 36, 3, 315–332.
- Cinque, G., 2010, *The syntax of adjectives: A comparative study* (Vol. 57), Cambridge MA, MIT Press.
- De Busser, R., 2009, *Towards a grammar of Takivatan Bunun: Selected topics* [PhD Thesis], La Trobe University.
- De Reuse, W., 2008, Denominal Verbs in Apachean Languages. *International Journal of American Linguistics*, 74, 4, 423–438.

- Dorais, L.-J., 2010, *The Language of the Inuit: Syntax, Semantics, and Society in the Arctic*, McGill-Queen's University Press.
- Embick, D., 2021, The Motivation for Roots in Distributed Morphology. *Annual Review of Linguistics*, 7, 1, 69–88.
- Fortescue, M., 1983, *A comparative manual of affixes for the Inuit dialects of Greenland, Canada, and Alaska*, Copenhagen, Busck.
- Fortescue, M., 1984, *West Greenlandic*, London, Croom Helm.
- Gerdts, D.B., & Hukari, T. E., 2008, "Halkomelem Denominal Verb Constructions" *International Journal of American Linguistics*, 74, 4, 489–510.
- Gerdts, D.B., & Marlett, S. A., 2008, "Introduction: The Form and Function of Denominal Verb Constructions", *International Journal of American Linguistics*, 74, 4, 409–422.
- Hale, K.L., S.J. Keyser, 2002, *Prolegomenon to a theory of argument structure*, Cambridge, MA, MIT Press.
- Halle, M., 1997, "Distributed Morphology: Impoverishment and fission", in: B. Bruening, Y. Kang, M. McGinnis (eds), *MITWPL 30: PF: Papers at the interface*, Cambridge MA, MITWPL, 425–449.
- Halle, M., A. Marantz, 1992, "Distributed Morphology and the pieces of inflection", in: K. Hale, S.J. Keyser (eds), *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, Cambridge MA, MIT Press, 111–176.
- Halle, M., A. Marantz, 1994, "Some key features of Distributed Morphology", *MIT Working Papers in Linguistics*, 21, 275, 88.
- Harley, H., 2014, "On the identity of roots", *Theoretical Linguistics*, 40, 3–4, 225–276.
- Harley, H., 2017, "The 'bundling' hypothesis and the disparate functions of little v", in: R. D'Alessandro, I. Franco, A.J. Gallego (eds), *The verbal domain* Vol. 1, Oxford, Oxford University Press, 3–28.
- Haugen, J.D., 2008, "Denominal Verbs in Uto-Aztecan", *International Journal of American Linguistics*, 74, 4, 439–470.
- Huang, Z., Z. Shih, 2018, *Bunongyuyufagailun* (3rd ed.). New Taipei City, Council of Indigenous Peoples.
- Ikonnikova, O., S. Kalinin, 2024, "Salish Lexical Affixation: A Typological Perspective", in: D.K.E. Reisinger, L. Griffin, E. Hannon, G. Mellesmoen, S. Nederveen, B. Oliver, J. Schillo, L. Schneider, B. Trotter (Eds.), *Papers for the International Conference on Salish and Neighbouring Languages* 59, BC: UBCWPL, 187–198.
- Johns, A., 2007, "Restricting noun incorporation: Root movement", *Natural Language & Linguistic Theory*, 25, 3, 535–576.
- Johns, A., 2009, "Additional facts about noun incorporation (in Inuktitut)", *Lingua*, 119, 2, 185–198.
- Li, L. L.-Y., 2018, *A Grammar of Isbukun Bunun* [PhD Thesis], National Tsing Hua University.
- Marantz, A., 1997, "No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon", *University of Pennsylvania Working Papers in Linguistics*, 4, 2, 201–225.
- Marlett, S. A., 2008, "Denominal Verbs in Seri", *International Journal of American Linguistics*, 74, 4, 471–488.
- Merlan, F., 1976, "Noun Incorporation and Discourse Reference in Modern Nahuatl", *International Journal of American Linguistics*, 42, 3, 177–191.
- Mithun, M., 1984, "The evolution of noun incorporation", *Language*, 60, 4, 847–894.
- Mithun, M., 1986, "On the nature of noun incorporation", *Language*, 62, 1, 32–37.
- Mithun, M., 1997, "Lexical Affixes and Morphological Typology", in: J.L. Bybee, J. Haiman, S.A. Thompson (eds), *Essays on Language Function and Language Type*, Amsterdam, John Benjamins Publishing Company, 357–372.
- Nojima, M., 1996, "Lexical prefixes of Bunun verbs", *Gengo Kenkyu (Journal of the Linguistic Society of Japan)*, 1996, 110, 1–27.
- Rizzi, L., G. Cinque, 2016, "Functional categories and syntactic theory", *Annual Review of Linguistics*, 2, 139–163.

- Sadock, J. M., 1980, "Noun incorporation in Greenlandic: A case of syntactic word formation", *Language*, 56, 3, 300–319.
- Sadock, J.M., 1986, "Some notes on noun incorporation", *Language*, 62, 1, 19–31.
- Stonham, J., 2008, „Verb–Argument Composition in Nuuchahnulth: A Special Case of Denominal Verb Formation", *International Journal of American Linguistics*, 74, 4, 511–528.
- Tsukida, N., E. Zeitoun, 2023, "Verbal Morphology of Formosan Languages", *The Formosan Languages: The Indigenous Languages of Taiwan*, Leiden, Brill.
- Vinyar, A. I., P. N. Kazakova, P. R. Naletova, 2017, "Chukchi Denominal Verb Construction: Overview and Relation to Noun Incorporation", *Higher School of Economics Research Paper No. WP BRP*, 58.
- Wiltchko, M., 2009, "√ Root incorporation: Evidence from lexical suffixes in Halkomelem Salish", *Lingua*, 119, 2, 199–223.
- Zeitoun, E., T. Chu, T., 2015, *A Study of Saisiyat Morphology*, Oceanic Linguistics Special Publications.

