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Truncation of Personal Names in Paiwan*

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This article examines commonly observed forms of truncated personal names based on first-hand data collected from two Paiwan villages (Piuma and Kaviangan) with a focus on their phonological regularities and restrictions. The majority of truncations is regulated by two guiding principles: meeting the minimal size of a prosodic word and replacing word-initial consonants with a glottal stop. However, different truncated forms indicate that the two principles are not obligatory. Truncated forms may meet the size requirement (e.g., *CV.CV(C)*) or replace the initial consonant with a glottal stop (e.g., *ʔV.CV.CV(C)*). Less commonly, some names have more than one truncated form. An optimality-theoretic analysis accounts for *ʔV.CV(C)* being the norm, indicating the importance of being bimoraic and reducing oral gestures of the initial consonant. The fact that only the most common type can be predicted also suggests that the ranking relation between constraints is not stringent, allowing a variety of truncated patterns to surface.

Key words: truncation, variation, prosodic word, glottal replacement, Formosan languages

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1. INTRODUCTION

Truncation is generally defined as a morphological process by which a shortened form with phonological regularities is derived from a longer, basic form. Cross-linguistically, one of the most productive types is name truncation, in which a person's name is shortened to generate hypocoristics (nicknames) conveying endearment or familiarity. Truncation of personal names is widely observed cross-linguistically and has been studied in English (Lappe 2003), German (Ito and Mester 1997), Japanese (Poser 1984), Indonesian (Cohn 2004), Spanish (Alber and Arndt-Lappe 2012), Catalan (Cabré 1998), French (Nelson 1998), Italian (Alber 2010, Kenstowicz 2019) and many other languages. Previous studies have indicated that name truncation is a highly systematic process that yields predictable phonological structures (Weeda 1992), usually involving mapping the base to a prosodic category (e.g., the foot).

Paiwan, an Austronesian language spoken in southern Taiwan, presents an interesting case of name truncation[1]. The majority of truncations follow two guiding principles: meeting the minimal size requirements of a prosodic word (i.e., a bimoraic shape) and replacing word-initial consonants with a glottal stop (e.g., *C*V.CV→*ʔ*V.CV), a process which is hereafter referred to as 'glottal replacement' and is analyzed as an abandonment of phonological features. Examples of forms following both guiding principles are given in (1).[2] Truncated names, however, do not necessarily follow both principles. A form may be truncated to fit the bimoraic shape without glottal replacement, as in (2a), or it may solely replace the initial consonant with a glottal stop without limiting the shape to two moras, as in (2b). Finally, there are also cases in which a base name may not have any truncated

1 Here and throughout the paper, name truncation in Paiwan refers to the truncation of personal names, since place name truncations are not observed.

2 In (1)-(3), the Name column lists the orthographic forms while the second and third columns contain the phonetic forms of full names and truncated names, respectively.

form at all, as shown in (3).

(1) Truncations following two principles

	Name	*Phonetic form*	*Truncated name*
a.	camak	[t͡sa.mak]	[ʔa.mak]
b.	valjakas	[va.ʎa.kas]	[ʔa.kas]
c.	puljaljuyan	[pu.ʎa.ʎu.jan]	[ʔu.jan]

(2) Truncations following a single principle

	Name	*Phonetic form*	*Truncated name*
a.	ljegean	[ʎə.gə.an]	[gə.an]
b.	sakinu	[sa.ki.nu]	[ʔa.ki.nu]

(3) No truncated form

	Name	*Phonetic form*	*Truncated name*
a.	ariv	[a.riv]	-----
b.	kui	[kuj]	----- (*[ʔuj])

This paper investigates common forms of truncated personal names in Paiwan, with an emphasis on their phonological regularities and restrictions. First-hand data were collected from two Paiwan village dialects, Piuma and Kaviangan, the personal names in which significantly overlap due to geographic proximity and strong cultural ties. By exploring name truncation in Paiwan, this paper aims to enhance our understanding of the nature of prosodic word requirements. In addition to presenting patterns of truncation in Paiwan, this paper also analyzes how syllable structure and the bimoraic requirement interact to determine which phonological strategy (or strategies) of truncation are used.

The structure of the paper is as follows. Section 2 outlines the basic language background of the two dialects, Piuma and Kaviangan. Moreover, it characterizes the non-phonological property and function of truncation in Paiwan. Section 3 presents the observed truncated forms, broken down by dialect and the truncation strategies used in truncations. Section 4 looks at the interaction between the shapes of truncation and the syllabic and prosodic requirements and discusses its implications. A constraint-based analysis of the most common truncated form (*ʔV.CV(C)*) is provided, showing that feature deduction is used as a way to shorten names. Concluding remarks are given in Section 5.

2. Background

2.1 Name truncation

Truncation, a morphological process by which a base form is shortened (McCarthy and Prince 1986), is considered a mapping of a base segment to a prosodic template rather than simply a deletion of segments from a base form (Marantz 1982). In Optimality Theory (OT) (McCarthy and Prince 1993, 1994; Prince and Smolensky 1993/2004), the shape and identity of truncation are characterized by an output-output correspondence between the base (B) and the truncated form (T). Many studies of name truncation have centered on the shape of shortened forms. For example, truncated forms must meet specific size requirements, be it a prosodic word, a foot or a syllable. Size requirements prevail even when variants of a single base form are observed. This is seen in the examples from Japanese in (4) in which shortened versions of personal names are combined with the suffix *-chan* /t͡ʃaN/ (where N stands for the mora nasal) (Mester 1990). The prosodic template of truncation is analyzed as a bimoraic foot (μμ), which subsumes disyllables (CVCV-*chan*) and a heavy monosyllable (CVV-*chan* or CVN-*chan*) (Poser 1984, 1990). While shortened names may involve shortening

(*Yoko-chan* from *Yooko*) or lengthening (*Mii-chan* from *Midori*), they must always contain two moras.

(4) Truncated names contain two moras (from Mester 1990: 479)

Name	*Truncation*	*Name*	*Truncation*
Akira	Aki-chan	Hiromi	Hiro-chan, Romi-chan
Keiko	Kei-chan	Midori	Mido-chan, Mii-chan
JuNko	JuN-chan	Mariko	Mari-chan, Mako-chan
Sachiko	Sach-chan	Takako	Taka-chan, Taa-chan, Tach-chan

Other languages, like English, employ monosyllabic name truncation,[3] as shown in (5). In an OT analysis of quantitative data, Lappe (2003) points out that English name truncations are not only subject to monosyllabicity, but are also restricted in terms of syllable structure: forms with a word-final coda consonant in (5.i) are favored (about 90%) while word-final consonant clusters as in (5.ii) are not (about 50%).

(5) Monosyllabic name truncation in English

	Name	*Truncation*		*Name*	*Truncation*
i.	Thomas	Tom	ii.	Alfreda	Alf
	Barbara	Barb		Camille	Cam
	Agatha	Ag		Elisabeth	Liz

Although often assumed as irregular or idiosyncratic, the structure of truncated names in various languages has been shown to follow language-specific

[3] There are two productive types of name truncations in English (Weeda 1992): monosyllabic truncated names, and disyllabic *y*-suffixed forms. The former is shown in (5), and examples of the latter include *Thomas* → *Tommy*, *Barbara* → *Barbie*, and *Agatha* → *Aggie*.

phonological and prosodic principles (Lappe 2003). Here, we use examples from Paiwan to demonstrate how truncated forms of personal names can be predicted by regularities or constraints of syllabic and prosodic structures.

2.2 The Paiwan language and basic phonology

Paiwan is an Austronesian language spoken in the southern mountainous area of Taiwan, mainly in the counties of Pingtung (屏東) and Taitung (台東). The population of the ethnic Paiwan is approximately 100,000, though the number of fluent speakers is far less.[4] Data in this paper were collected in two villages: Piuma (平和) and Kaviangan (佳平) in Taiwu (泰武) Township, Pingtung County. Geographically, both villages lie in the center of the Paiwan area, with Piuma located around 15 km south of Kaviangan. The two villages are closely related and are often classified as belonging to the same subgroup (Ferrell 1982, Cheng 2016). The consultants interviewed for this study claimed that Piuma belongs to the Tjaquvuquvulj group and Kaviangan to the Pavuavua group, which historically shared community circles before massive transfers in recent decades.

Paiwan has four vowels, /i u ə a/, without any phonemic distinction in vowel length.[5] The number of consonants ranges from 20 to 23 due to the replacement or merging of sounds in different communalects (Ho 1977, 1978; Ferrell 1982; Cheng 2016; among others). The consonant inventory of Piuma Paiwan is listed

[4] According to a survey of Taiwan's Department of Household Registration in February 2020, the population of Paiwan is 102,674. However, it is the author's impression that most of the Paiwan people who are able to use their native language fluently in daily life are over 60 years old.

[5] Ho (1977: 606) considers /ə/ a restricted vowel because it never occurs in the word-initial or word-final position. In Sinvaudjan (a southern village), the words /ənəm/ 'six' and /gadə/ 'mountain' begin or end with a schwa, though in other village dialects these are /unəm/ and /gadu/ respectively. These exceptions are observed in sporadic sound correspondences including /u/~/ə/ and /i/~/ə/. Moreover, words ending in a schwa such as /quʌiŋəŋə/ 'Pouzolzia elegans (plant species)' can be found in Piuma, a village in the central Paiwan area.

in (6).[6] The retroflex stop /ɖ/ from Proto-Paiwan *ɖ, which has been retained as a stop in many southern and eastern dialects, is realized as a retroflex fricative [ʐ] in Piuma. The Proto *r is pronounced as a uvular fricative /ʁ/. The phoneme /z/ and /ts/ are usually pronounced as palatalized [zʲ] and [tsʲ]. As for Kaviangan Paiwan, the phonemic consonants are mostly the same as those in Piuma with the following exceptions. First, the /q/ phoneme (in Piuma and other southern dialects) from Proto-Paiwan *q has become a glottal stop [ʔ]. Second, the Proto sound *ɖ has become /r/; thus *ɖ and *r have merged into the /r/ in Kaviangan. Third, palatal stops /c/ and /ɟ/ have a more anterior articulation similar to palatalized alveolars [tʲ] and [dʲ] in Kaviangan, but the contrast between /t, d/ and /c, ɟ/ remains.[7] The glide /w/ is absent in (6) because it is mostly restricted to the final position of a word in other southern dialects and is realized as /v/ in both Piuma and Kaviangan. The lateral phoneme /ʎ/ is a true palatal sound in many southern dialects, but is more fronted like [lʲ] in these two villages. The form [ʎ] is used in phonetic transcriptions in order to show consistency. As a sound that appears only in loanwords, /h/ is not considered as a part of the inventory. With regard to allophonic variation, voiced obstruents tend to be devoiced in the word-final position, and the palatal lateral /ʎ/ is realized as a voiceless word-finally.

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[6] In order to make the consonantal phonemes comprehensible to the reader, I use an inventory similar to the version of orthography presented by the Ministry of Education and the Council of the Indigenous Peoples in 2005. Dialectal differences between the "standard" one and those in Piuma and Kaviangan will be clarified.

[7] The phonemic contrast between /t, d/ and /c ɟ/ has been lost and has merged into the alveolar ones in some northern villages of Paiwan, such as Stimul (三地門) (Ho 1978, Chen C.-M. 2009, Cheng 2016).

(6) Consonantal phonemes in Piuma Paiwan

	Bilabial	Labiodental	Alveolar	Retroflex	Palatal	Velar	Uvular	Glottal
Plosive	p b		t d	ɖ	c ɟ	k g	q	
Fricative		v	s z				ʁ	
Affricate			ts					
Nasal	m		n			ŋ		
Tap/flap			r					
Lateral				ɭ	ʎ			
Glide					j			

Syllable structure in Paiwan is generally confined to CV(C), though underlying vowel hiatus results in complex nuclei, influencing stress placement. Complex syllable margins (i.e., onset and coda clusters) are not tolerated. The syllable onset position accommodates all phonemic consonants[8], but codas are restrictive—a word-final coda can be any consonantal phoneme, while word-internal codas are limited to nasals and glides. In other words, only word-medial CVC syllables may end in nasals /m n ŋ/ or glides /w j/; otherwise, word-internal syllables have a CV structure.[9] Stress usually falls on the penultimate syllable (Ho

[8] Syllable onsets usually do not begin with glides /w/ or /j/ with the exception of the word /ki-jaja/ ‘to pick, pluck’. Other words containing glide onsets are mostly loanwords from Japanese.

[9] Word-internal codas which are neither glides nor nasals can be observed in fossilized (or lexicalized) reduplicated forms in which the root ($C_1V_1C_2$) has undergone full reduplication ($C_1V_1C_2.C_1V_1C_2$) and become fossilized, and are thus no longer identifiable (e.g., /viqəviq/~/viqviq/ ‘ripple’, /ŋisəŋis/~/ŋisŋis/ ‘beard’). However, in some cases, an intervening vowel between two identical CVC syllables is dropped.

1977, Ferrell 1982).[10] While the majority of Paiwan village dialects have regular penultimate stress and treat all vowels the same in terms of stress assignment, some dialects in the central Paiwan area (such as Piuma) disfavor stressed schwa /ə/ (Chen C.-M. 2009), resulting in stress being shifted to one of the last two syllables (e.g., [sá.ʃiq] 'ant', [qə.zúŋ] 'window'). More specifically, if the penultimate syllable is a schwa, stress moves to the last syllable unless it is an open syllable containing schwa (e.g., [l̥ə.sə́q] 'tear' and [l̥ə́.ɟə] 'thin'). Also, when a penultimate syllable ends in a consonant, stress shifts to the final syllable (Yeh 2017).

2.3 Personal names and truncation in Paiwan

The Paiwan people are renowned for their social hierarchy (Shih 1956, Chen C.-L. 1988), in which the difference between the nobility and commoners is represented in rituals, sculpture decorations, textiles, and tattooing. Social hierarchy is also reflected in naming customs. A Paiwan name consists of a personal name and a house name with a linker *a* in between, such as Sauljatjuy (personal name) a Qaluvu (house name). House names follow primogeniture, passed on to the first-born child regardless of gender. A personal name, which is usually gender-specific, is drawn from a pool of ancestral names (Ku 2010, 2019). Therefore, a personal name conveys one's ancestry. The major reason that Piuma and Kaviangan villages are studied in this paper is that they are geographically close and culturally similar and thus share many personal names. It would be difficult and irrelevant to compare and generalize the process of truncation when the name pool of targeted village dialects does not overlap. For example, the names

[10] Stress shifts to the ultima in three circumstances: (i) when the final syllable of a prosodic word is derived from underlying vowel hiatus, (ii) in monosyllabic words, and (iii) when a prefix/infix is added to a monosyllabic root. In the first situation, the underlying vowel hiatus is modified to become tauto-syllabic.

qaljayup and *kivi* from the southern villages are not found in Piuma and Kaviangan.

Paiwan, like many of the languages mentioned in Section 1, uses name truncation to express endearment and intimacy between family members or friends, as the Paiwan word papiayan means. A full name and a truncated name are used in the same contexts without much difference in semantics and pragmatics. The use of truncated names implies a familiarity between the speaker and the addressee. As mentioned by the consultants for this work, shortened forms of personal names are often necessary in order to refer to different people with identical names in a three- or four-generation family. For example, if a child is named *tsamak* after his grandfather *tsamak*, family members of grandfather's generation would address the elder by his full name, *tsamak*, and the child by a shortened form, *ʔamak*. It is also common to express intimacy by calling an elder the truncated form, such as *vuvu i ʔuku* 'Grandma cuku' or *mama i ʔamak* 'Uncle tsamak'. Some consultants say that when a base name has two truncated versions, the shorter form is used in early childhood while the other one is used when the child grows older. For example, for the name *galajgaj*, the truncated form *ʔagaj* would be used in early childhood and *gagaj* in adolescence. Another consultant from the Piuma village, with a great wealth of knowledge of Paiwan, mentioned that a personal name may have two or more truncated forms: one for villagers and the other especially for family members, who decide on a name and its nickname for a new born child. Examples of multiple truncated names are shown in (7). Shortened forms for each family may thus vary by different house/family though the form of the general truncation follows certain regularities.[11]

[11] This paper focuses mainly on the phonological patterns of truncated personal names; therefore, other aspects of truncation, including morphological, pragmatic, and cultural, fall outside the scope of this paper.

(7) Names and their specific truncated forms from a consultant's family

	Full name	*Truncated*	*Truncated name for family*
a.	[ə.ʎa.jum]	[ʔá.jum]	[ʔú.ʔiŋ]
b.	[ʎu.zʲəm]	[ʔú.zʲəm]	[ʔí.ʐi]
c.	[ɖə.mə.ɖə.man]	[ʔí.man]	[mí.mi] / [í.mi]

3. Patterns of name truncation in Piuma and Kaviangan

Name truncation in Paiwan cannot be neatly accounted for by a single rule. Patterns of truncation display variations, which are confined to phonological and morphological principles. Despite variations, phonological preferences are observed. This section describes the different types of truncated forms. Relevant data collected from the two villages were analyzed to determine the frequency at which they are observed.

3.1 Proportion of truncation types

The data were collected from four consultants, two males from the Piuma village and two females from the Kaviangan village.[12] A total of 84 truncated names were collected in Piuma, and 61 in Kaviangan, excluding names without

[12] The data from Piuma includes 84 contributions from a 59-year-old man (M1), who is renowned for his wealth of knowledge of Paiwan (including language, culture, arts, plants, etc.) passed down from his father, and 71 contributions from a 67-year-old man (M2). The Kaviangan data includes 61 contributions from a 67-year-old woman (F1), who has been dedicated to the preservation of the Paiwan language and culture for decades, and 51 contributions from a 72-year-old woman (F2).

shortened forms. The observed truncations were divided into three main types: (1) disyllabic forms with an initial glottal stop (*ʔV.CV(C)*), (2) trisyllabic forms with an initial glottal stop (*ʔV.CV.CV(C)*) and (3) disyllabic forms without glottal replacement (*CV.CV(C)*). Some names had more than one truncated form; these truncations were classified as belonging to a fourth type, which was further divided into three subcategories based on the combination of the three aforementioned types: (i) variations between *ʔV.CV.CV(C)* and *ʔV.CV(C)*, (ii) variations between *CV.CV(C)* and *ʔV.CV(C)* and (iii) variations between *ʔV.CV.CV(C)* and *CV.CV(C)*. Though comprising a small percentage of the data, Type 4 truncations reflect the flexible properties of truncated names. Similar observations have been made in other languages such as Japanese (Poser 1984, Mester 1990) and Romanian (Avram 2015:11). Type (4.i) shows the overall dominance of glottal replacement, while Type (4.ii) emphasizes the size requirement. The variants in Type (4.iii), on the other hand, are either disyllabic without an initial glottal stop or are not disyllabic with an initial glottal stop. That is, the variants are not characterized by the same principle of truncation. Overall, the disyllabic form with an initial glottal stop (*ʔV.CV(C)*) is the norm, accounting for the majority of truncated names in both Piuma and Kaviangan.

The data from Piuma is listed in Figure 1. Type 1 (*ʔV.CV(C)*) tops the list accounting for over 66% of truncations. Though far less common, Type 3, the disyllabic form with its original base consonant, is the second most common pattern (around 17%). The third-ranked form is Type 4.ii, with both *ʔV.CV(C)* and *CV.CV(C)* as variants (8%).

Type		*Truncation*	*Proportion*[13]
1		ʔV.CV(C)	56/84
2		ʔV.CV.CV(C)	5/84
3		CV.CV(C)	14/84
4	i.	ʔV.CV.CV(C) & ʔV.CV(C)	1/84
	ii.	CV.CV(C) & ʔV.CV(C)	7/84
	iii.	ʔV.CV.CV(C) & CV.CV(C)	1/84

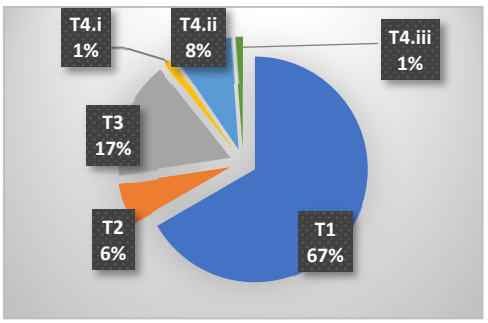

Figure 1. Proportions of truncation types in Piuma

A similar pattern is observed in Kaviangan, as shown in Figure 2. Type 1 (the disyllabic form with an initial glottal stop) accounts for over 57% of the truncated names. Second highest, at 24%, is Type 3, the disyllabic form with a base consonant. The third ranked form is Type 4.ii with the two disyllabic forms *ʔV.CV(C)* and *CV.CV(C)* as variants (11%).

[13] In the Proportion column, the numerator is number of truncated names of each type while the denominator represents the number of personal names collected.

Type		*Truncation*	*Proportion*
1		ʔV.CV(C)	35/61
2		ʔV.CV.CV(C)	3/61
3		CV.CV(C)	15/61
4	i.	ʔV.CV.CV(C) & ʔV.CV(C)	0/61
	ii.	CV.CV(C) & ʔV.CV(C)	7/61
	iii.	ʔV.CV.CV(C) & CV.CV(C)	1/61

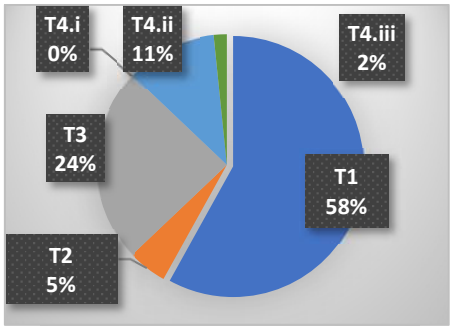

Figure 2. Proportions of truncation types in Kaviangan

It is apparent that Piuma and Kaviangan share the same guiding principles in the truncation process. The prevalence of Type 1 (*ʔV.CV(C)*) suggests the importance of the two principles—size and initial glottal stop. The second and third most common forms, Type 3 (*CV.CV(C)*) and Type 4.ii (*CV.CV(C) & ʔV.CV(C)*), are also disyllabic. Overall, these top three types account for a significant proportion of the data collected from both dialects (90% in Piuma, 92% in Kaviangan) suggesting that the disyllabic size requirement is paramount.

3.2 The data

In both villages, the disyllabic form with an initial glottal stop accounts for the overwhelming majority of truncated names. In cases when the base name is only two syllables, cutting an entire syllable is not an option since doing so would violate the minimal size requirement. To truncate, then, the initial consonant of the base is replaced with a glottal stop. Names with more than three syllables, however, also present this type of truncated form. Examples from both Piuma and

Kaviangan are listed in (8).[14] Disyllabic bases are truncated through replacing the initial consonant with a glottal stop, as shown in (8a). Disyllabic bases with word-medial coda consonants, as in (8b), use the same strategy though the first closed syllable is sometimes simplified. Note that truncations for names with word-internal coda vary in the two village dialects, but both retain the disyllabic shape. Bases with three or more syllables are shortened to two syllables, the first consonant of which undergoes glottal replacement, as shown in (8c). Additional name truncation data are provided in the Appendix.

(8) Type 1 truncation: ʔV.CV(C)

	Full name	*Truncated forms*	
		Piuma	*Kaviangan*
a.	/cu.ku/	[ʔú.ku]	[ʔú.ku]
	/sə.ɟam/	[ʔə.ɟám]	[ʔə.ɟám]
	/zə.puʎ/	[ʔə.púʎ]	[ʔə.púʎ]
	/ɭi.ʎuk/	[ʔí.ʎuk]	[ʔí.ʎuk]
	/ʎa.ʎuj/	[ʔá.ʎuj]	[ʔá.ʎuj]
	/ʎu.zəm/	[ʔú.zʲəm]	[ʔú.zʲəm]
	/tsa.mak/	[ʔá.mak]	[ʔá.mak]
	/tsə.gav/	[ʔə.gáv]	[ʔə.gáv]
b.	/ɭaj.ɭaj/	[ʔí.ɭaj]	[ʔi.ɭáj]
	/saŋ.kiʎ/	[ʔaŋ.kíʎ]	[ʔaŋ.kíʎ]
	/tsam.kim/	[ʔaŋ.kím]	[ʔi.kím]
	/ɭaŋ.pav/	[ʔaŋ.páv]	[ʔu.páv]

[14] In (8)-(13), full (or base) names are presented in phonemic forms, and the truncated versions are in phonetic forms.

c.	/tsa.pa.dis/	[ʔá.dis]	[ʔá.dis]
	/tsə.mə.das/	[ʔə.dás]	[ʔə.dás]
	/a.ɭiŋ.ʔiŋ/	[ʔí.ʔiŋ]	[ʔí.ʔiŋ]
	/pa.ta.gav/	[ʔá.gav]	[ʔá.gav]

Trisyllabic bases are not always truncated to two syllables. These forms may use glottal replacement instead. Examples of trisyllabic truncated forms with the first consonant replaced are given in (9).

(9) Type 2 truncation: ʔV.CV.CV(C)

Full name	*Piuma trunc.*	*Full name*	*Kaviangan trunc.*
/ta.ka.nav/	[ʔa.ká.nav]	/ta.ka.nav/	[ʔa.ká.nav]
/ʎa.ma.jav/	[ʔa.má.jav]	/tsu.ga.gaŋ/	[ʔu.gá.gaŋ]
/ʎa.va.kav/	[ʔa.vá.kav]	/ma.səg.səg/	[ʔa.gə́.sə]

Polysyllabic names may also be reduced to two syllables without glottal replacement, as seen in (10). In this case, the base form may involve reduplication or the addition of a prefix/infix such as *-al-/-alj-*, *lja-* or *sa-*. In other words, names like *giʎgiʎav*, *kərkər* and *zuʎzuʎ* with word-internal reduplication ($C_1V_1C_2.C_1V_1C_2$) tend to truncate as *CV.CV(C)* without glottal stop replacement. Names such as *gaɭajgaj* or *sakiŋi* contain prefixes or infixes commonly found in Paiwan (underlined). Such bases also favor *CV.CV(C)* truncation.

(10) Type 3 truncation: CV.CV(C)

Full name	*Piuma trunc.*	*Full name*	*Kaviangan trunc.*
/giʎ.gi.ʎav/	[gí.av] / [gjáv]	/giʎ.gi.ʎav/	[gí.av] / [gjáv]
/kər.kər/	[kí.ki]	/kər.kər/	[kə.kə́r]
/zuʎ.zuʎ/	[zú.zuʎ]	/zuʎ.zuʎ/	[zú.zuʎ]

/ga.ɭaj.gaj/	[gá.gaj]	/ga.ɭaj.gaj/	[gá.gaj]
/ʎa.ʎə.qə.ɭan/	[ʎí.ʔi]	/ʎa.ʎə.ʔə.ɭan/	[ʎə́.ʔə]
/sa.ki.ŋi/	[kí.ŋi]	/sa.kə.ŋə/	[kə́.ŋə]
/ʎi.gi.an/	[gí.jan] / [gján]	/ʎə.gə.an/	[gə́an]

The fourth type, though less common, are names with two truncated forms. This type has three subgroups based on the combinations of the three main types. Type 4.i alternates between *ʔV.CV.CV(C)* and *ʔV.CV(C)*, as seen in (11), while Type 4.ii varies between *CV.CV(C)* and *ʔV.CV(C)*, as seen in (12).

(11) Type 4.i truncation: with an initial glottal stop

Full name	*Piuma trunc.*	*Full name*	*Kaviangan trunc.*
/pu.ki.ri.ŋan/	[ʔi.rí.ŋan]	---	---
	[ʔí.ŋan]		

(12) Type 4.ii truncation: disyllabic form

Full name	*Piuma trunc.*	*Full name*	*Kaviangan trunc.*
/ɟu.pə.ɭaŋ/	[pí.aŋ]	/ɟu.pə.ɭaŋ/	[pə.ráŋ]
	[ʔjáŋ]		[ʔə.ráŋ]
/ka.ɭəs.kəs/	[kə.kə́s]	/ka.ɭəs.kəs/	[kə.kə́s]
	[ʔə.kə́s]		[ʔə.kə́s]
/ru.ta.mə.kan/	[tá.mək]	/ru.ta.mə.kan/	[tá.mək]
	[ʔá.mək]		[ʔá.mək]
/a.ra.riv/	[rá.riv]	/ʎa.va.us/	[váws]
	[ʔá.riv]		[ʔáws]
/rə.sə.rəs/	[rə.rə́s]	/sa.u.ni.av/	[ʔaw.njáv]
	[ʔə.rə́s]		[njáv]

Type 4.iii allows both *ʔV.CV.CV(C)* and *CV.CV(C)*, as shown below.

(13) Type 4.iii truncation: follow only one of the two principles

Full name	*Piuma trunc.*	*Full name*	*Kaviangan trunc.*
/ku.ʎə.ʎə/	[ʔu.ʎə́.ʎə]	/ku.ʎə.ʎə/	[ʔu.ʎə́.ʎə]
	[ʎí.ʎi]		[ʎə́.ʎə]

Type 4.ii, with *CV.CV(C)* and *ʔV.CV(C)* as variants, is more common than Types 4.i and 4.iii in Piuma (8% of truncated names) and Kaviangan (11%). In all three subtypes with variations, one form is a simpler version of the other. For example, of the truncated forms for name *pukiriŋan* in (11), [ʔí.ŋan] is shorter than [ʔi.rí.ŋan], [ʔá.mək] is the simpler version of [tá.mək] for *rutamәkan* in (12), and [ʎə́.ʎə] is the shorter one of [ʔu.ʎə́.ʎə] for name *kuʎәʎә* in (13).

To sum up, the most frequently observed form of truncated names is disyllabic with an initial glottal stop (*ʔV.CV(C)*). Other less common types are either disyllabic or have an initial glottal stop. These various types are restrained by consistent phonological principles of this language.

4. Analysis

4.1 The guiding principles of truncation

Though various forms are observed, personal name truncation in Paiwan is guided by two dominating principles: one limits the size of the truncated name and the other governs the form. The first principle dictates that the truncated name be bimoraic, or exactly the size of a foot.[15] The data analysis in Section 3 showed that Type 1 (*ʔV.CV(C)*) was the most common form of truncation. The truncation

[15] In Paiwan, a foot usually contains two syllables, one mora each (Ferrell 1982). However, a foot can also be a single syllable carrying two moras based on evidence from hiatus and its resolutions, stress, and minimal prosodic words (Yeh 2011).

process replacing the initial base consonant with a glottal stop involves feature reduction by which the place feature is lost. However, it should be noted that the glottal stop is not always perceived clearly. The existence of the initial glottal stop will be justified below.

4.1.1 Size restrictions

Many truncated forms seem to be either disyllabic or monosyllabic with a diphthong. Looking at the proportion of truncation types based on the number of syllables, disyllabic truncations (including Types 1, 3 and 4.ii, as shown in Figure 1 and (8)) account for 91% of truncated forms in Piuma and 93% in Kaviangan. Clearly, disyllabicity is a major principle in the truncation process. That is to say, there is a strong preference for a two-syllable truncated form. Other Austronesian languages have a similar tendency, perhaps because the canonical root form of Proto-Austronesian was disyllabic (Wolff 1999, 2003). Nevertheless, underlying vowel hiatus (i.e., vowel sequence) in Paiwan is modified mainly through glide formation and coalescence, resulting in a heavier syllable containing two moras (Yeh 2011). A two-syllable word usually contains two moras, but not necessarily vice versa. For example, the truncated form of /tsa.pa.dis/ is [ʔáμ.diμs], which is disyllabic and bimoraic, while the monosyllabic truncations of /ʎa.va.us/ (i.e., [váμwμs] or [ʔáμwμs]) also carry two moras. Thus, the pattern is better captured by considering size restriction on truncation in terms of moras. It is worth noting that most roots in Paiwan are disyllabic (Ho 1978, Ferrell 1982), and monosyllabic roots are considered bimoraic due to the longer duration of vowels (Yeh 2011: 112). Being bimoraic satisfies the minimum requirement of a prosodic word, which contains at least a foot. The bimoraic size requirement is not only prominent in name truncation but is also essential in the phonology of Paiwan.

4.1.2 Initial glottal stop as feature reduction

Another leading principle relates to the glottal stop in the initial position of truncated forms. The morphological process of truncation is realized by the phonological process of glottal replacement, and here, glottal replacement is analyzed as the loss of the oral gestures (i.e., feature reduction). If considering only truncated forms with an initial glottal stop (Types 1, 2, 4.ii), regardless of the number of syllables, these forms account for 73.8% of the data in Piuma and 62.3% in Kaviangan. Substituting a glottal for an initial consonant is not a fundamental phonological rule in Paiwan. Instead, in order to show that morphologically a truncated form is shorter or smaller than its base, something must be curtailed.

There are two plausible analyses to account for the match between a base name and its truncation: first, glottal replacement is the result of feature deletion (e.g., ***ts****amak* → ***ʔ****amak*), or second, there is no glottal stop, rather the initial consonant is deleted (e.g., ***ts****amak* → *amak*); the latter analysis will be proven untenable, since the majority of Paiwan names are disyllabic and cutting entire syllable may violate the size requirement (e.g., *tsamak* → **mak*). In the case of glottal replacement, the place feature of the first consonant is lost while preserving the segment, while base consonant deletion entails the word-initial consonant being cut off completely. An argument for the existence of the initial glottal stop can be made by considering examples with vowel hiatus. When a truncated name follows the particle *i* for personal names and pronouns, a glottal stop is observed, as can be seen in (14). The example consists of a nominative case, a kinship term, the particle *i* and a name, with its base in parenthesis, being used to refer and address someone in a hypocoristic sense.

(14) Glottal-initial rather than vowel-initial

	NOM+kinship term+particle+name	*Phonetic form*	*Gloss*
a.	/ti kama i ʔubak/ (<canubak)	[ti.ka.maj.**ʔ**u.bak]	‘Uncle Canubak’

b.	/ti vuvu i ʔubak/ (<canubak)	[ti.vu.vuj.**ʔ**u.bak]	‘Grandpa Canubak’
c.	/ti vuvu i ʔiʔiŋ/ (<aliŋʔiŋ)	[ti.vu.vuj.**ʔ**i.ʔiŋ]	‘Grandma Aliŋʔiŋ’
d.	/ti ina i ʔadis/ (<tsapadis)	[ti.naj.**ʔ**a.dis]	‘Aunt Tsapadis’
e.	/ti ʔaŋu/ (<raŋalu)	[ti.**ʔ**a.ŋu]	‘Raŋalu’

In contrast, no glottal stop surfaces when a true hiatus is formed, as can be seen in (15). Paiwan employs a different strategy to repair illicit two-vowel clusters via glide formation, glide insertion, or coalescence. As examples in (15a-c) demonstrate, hiatus of different vowels (e.g., /a+u/ or /i+a/) triggers glide formation while less sonorous vowels surface with a glide. In vowel concatenations, however, both glide insertion and glide formation are possible, in which a homorganic glide is added between vowels. Another strategy is coalescence, as in (15d-e), in which two identical vowels are combined into one.

(15) Repair strategies to vowel hiatus (from Yeh 2011)

	Stem		*Gloss*	*Vowel hiatus*		*Gloss*
a.	aʌak	[á.ʌak]	‘child’	p**u**-**a**ʌak	[p**wá**.ʌak] [p**u.wá**.ʌak]	‘to have child’
b.	inu	[í.nu]	‘where’	m**a**-**i**nu	[m**áj**.nu] [m**a**.**jí**.nu]	‘where to go’
c.	ita	[í.ta]	‘one’	sik**a**-**i**ta	[ʃi.k**áj**.ta]	‘first’
d.	ukuʌ	[ú.kuʌ]	‘back’	s**u**-**u**kuʌ	[s**ú**.kuʌ]	‘your back’
e.	aʌis	[á.ʌis]	‘tooth’	qats**a** **a**ʌis	[qa.ts**á**.ʌis]	‘big tooth’

Moreover, when a high vowel is in the middle of a three-vowel sequence, it surfaces as a glide spanning two syllables (Yeh 2011: 557), as can be seen in (16). Following this pattern, (14d) would be [ti.na**j**.**j**a.dis] if the truncated name *adis*

(from *tsabadis*) begins with a vowel. The phonetic form [ti.naj.**ʔ**a.dis] suggests that a glottal stop is present in the initial position of the truncated form. Thus, I assume in this paper that most truncations (Types 1 & 2) begin with a glottal stop [ʔ] based on the systematic difference between (14) and (15-16), nullifying the second assumption of vowel-initial truncations (e.g., ***ts****amak* → *amak*).

(16) Concatenation of three vowels (from Yeh 2011: 557)

	Underlying Vowels	*Phonetic form*	*Gloss*
a.	/pava**i**-aʔən/	[pa.va**j**.**j**á.ʔən]	'give me'
b.	/ʔi-ka**i**-aŋa/	[ʔi.ka**j**.**j**á.ŋa]	'already talked'
c.	/man-sika**u**-aʔən/	[man.ʃi.ka**w**.**w**á.ʔən]	'I make net-bags'
d.	/ma-qi**u**-aŋa/	[ma.qi**w**.**w**á.ŋa]	'already scorched'

Given that most truncated forms reduce the initial consonant to a glottal stop, this phonological process can be considered debuccalization, in which an oral stop turns into a laryngeal consonant [h], [ɦ] or [ʔ] (O'Brien 2012:2). Debuccalization has received attention in various aspects of phonology since it has been deemed a subtype of lenition in the literature (Bauer 2008, Gess 2009, among others). Research has covered the chronological process of debuccalization, the degree of weakening, the targets and results of debuccalization, how its complexity in feature systems to be accounted for (Clements 1985, McCarthy 1988, Fallon 1998), and the phonetic realization and articulatory gestures (O'Brien 2012). Typological surveys of debuccalization have revealed types of synchronic and diachronic patterns in many languages (Lavoie 1996, de Lacy 2002). Examples span several languages including Ainu, in which [p t k t͡ʃ ɾ] becomes [h] in the coda position (Poser 2001); Ukrainian, in which [ɣ] debuccalizes into [ɦ] in the onset position (Czaplicki 2006); Kagoshima Japanese, in which stops and affricates become [ʔ] in the coda position (Kaneko and Kawahara 2002).

Paiwan adopts phonological debuccalization in the formation of truncated names. Although C → ʔ is considered an instance of debuccalization, it differs from the general patterns found in other languages in two ways: firstly, all consonants including sonorants and obstruents become [ʔ];[16] secondly, it is not an alternation conditioned by a specific phonological environment but is triggered by truncation, a morphological process. In terms of feature geometry, debuccalization in Paiwan removes not only the [place] feature (i.e., oral gestures) but also features related to continuancy.[17] In this study, delinking features is analyzed as the main kind of truncation—to remove features, not segments, from the base form to avoid violating other requirements like that for size.

The glottal stop resulting from feature reduction is an unmarked segment that lacks supralaryngeal specifications. It is also one of the most common epenthetic consonants cross-linguistically because of its featural unmarkedness. Even when lenis [ʔ] is not officially a part of a phonemic inventory, it may nevertheless be commonly observed. For example, a rule reducing /p, t, k/ to a glottal stop [ʔ] is observed in Toba Batak (O'Brien 2012:10, Hayes 1986), in which [ʔ] is not a phoneme (Nababan 1981:11). More interestingly in Paiwan, glottal stop [ʔ] is a phoneme in Kaviangan but not in Piuma. Diachronically, the reconstructed phoneme *q changed into /ʔ/ in Kaviangan but has remained intact in Piuma. The q~$ʔ$ correspondence as shown in (17) can be found in many northern and central dialects of Paiwan.

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[16] In many examples of debuccalization, voiceless obstruents are the most common targets, though cases with voiced obstruents or sonorants have been observed (O'Brien 2012:2).

[17] Cross-linguistically, it is common that fricatives debuccalize to [h], retaining [+continuant] while stops debuccalize to [ʔ], maintaining [-continuant]. Previous works provide various analyses accounting for the relation between the Place feature, continuancy, and laryngeal specification (i.e., Clements 1985, McCarthy 1988, and Iverson 1989). Since consonants debuccalize to [ʔ] in Paiwan, [-continuant] accompanies. As glottal stops involve laryngeal constriction, it is incompatible with [+voice].

(17) Correspondence between *q* in Piuma and *ʔ* in Kaviangan

Piuma	*Kaviangan*	*Gloss*	*Piuma*	*Kaviangan*	*Gloss*
qulu	**ʔ**ulu	‘head’	uma**q**	uma**ʔ**	‘house’
qadid	**ʔ**adid	‘bitter’	ta**q**əd	ta**ʔ**əd	‘to sleep’

Therefore, the process of reducing consonants into a glottal stop is clearly present in Paiwan truncation, regardless of the phonemic status of [ʔ].[18] Note that in Kaviangan, it would not be a problem to differentiate a glottal phoneme /ʔ/ (<**q*) and a phonetic glottal [ʔ] through debuccalization in the word-initial position because the latter appears only in truncated names.[19] Further research on glottal stops is warranted to determine whether native speakers are perceptually aware of the glottal stops from different sources.

4.2 OT analysis

In this section, I propose an analysis based on the framework of Optimality Theory to show how the basic type of truncation (*ʔVCV(C)*) results from the interactions between necessary constraints in Paiwan. Requiring a minimum of two moras and to begin with a placeless glottal stop plays an important role in the truncation of disyllabic base names, though both principles are violable. Once the requisites are satisfied, the pressure from other constraints is released, and therefore various outputs can be observed especially in bases with more than three syllables.

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[18] A similar case is observed in my fieldwork on the Amis language. Personal names are truncated to show hypocoristics, such as *katsaw* → ***ʔ****atsaw* (male) and *panay* → ***ʔ****anay* (female). Consonant reduction is also found in word-medial onset position, i.e., *lisin* → ***ʔ****i****h****in*. The fricative loses its oral place feature and becomes a [h], which is not a phoneme in Amis and only occurs in loanwords.

[19] In the name pool collected, the name *ʔavus* in Kaviangan (*qavus* in Piuma) has no shortened form because it already has the shape of a truncated name.

The requirement for truncated forms to contain two moras, which usually results in a disyllabic surface form, can be attributed to TRUNC=PRWD and PRWD=FOOT from Generalized Template theory (McCarthy and Prince 1994). The size of the truncated form results from constraint interactions rather than one specific size constraint. Since a prosodic word equals a foot and a foot has the minimal size of two moras (Yeh 2011), it is natural for truncated words to satisfy the size of a foot.[20] Thus, the constraint TRUNC=PRWD is ranked high. Preference for truncation-initial glottal stops can be attained through the interactions between REALIZE-MORPHEME, IDENT-BT-PLACE, and *PLACE. A truncated form must differ from its base form in order to realize the truncated morpheme, especially in a disyllabic base. For REALIZE-MORPHEME to outrank *PLACE, the most economic strategy employed in Paiwan is to abandon place features despite creating violations of the correspondence between the truncated from and its base. For MAX-BT to rank lower than PRWD=FOOT, segment deletion is restrained to keep the minimum size. Definitions of the constraints are given in (18).

(18) Constraint definitions

TRUNC=PRWD: A truncated form equals a prosodic word.

PRWD=FOOT: A prosodic word equals a foot (which is bimoraic in Paiwan).

REALIZE-MORPHEME (REAL-MORPH): Every morpheme has to be expressed in the phonological structure. (Kurisu 2001)

IDENT-BT(PLACE): Let α be a segment in B(ase), and β be a correspondent of α in T(runcation). If α is [γplace], then β is [γplace].

*PLACE: Place features are not allowed.

[20] To save space, only TRUNC=PRWD is listed in the tableaux.

ANCHORING-BT-RIGHT: Any segment at the right periphery of the base has a correspondent at the right periphery of the truncation (i.e., no deletion at the right edge).

ONSET: Syllables must have onsets.

MAX-BT: Every element in B(ase) has a correspondent in T(runcation).

The tableau in (19) illustrates how *ʔVCV(C)* is the most common form through constraint interactions, especially for disyllabic bases. When the base is exactly a foot, candidate (a) is ruled out because it remains intact without any realization of the truncation morpheme, violating the dominant constraint REAL-MORPH. Candidate (b), on the other hand, truncates too much. Candidate (c) is out because it does not anchor the rightmost segment. Compared with (e), (d) violates the lower-ranked MAX-BT and syllabic markedness constraint ONSET, making it a worse than candidate (e). Candidate (f) violates IDENT-BT(PLACE) twice without satisfying higher constraints. Candidate (e) is thus the optimal form. The lower-ranked constraints MAX-BT and *PLACE indicate that deleting segments of the base and losing place feature is the more profitable way to satisfy higher-ranked constraints.

(19) The most common form of name truncation

/tsamak/	REALMORPH	TRUNC=PRWD	ANCHOR-BT-R	ONSET	IDENT-BT(PL)	MAX-BT	*PLACE
a. tsa.mak	*!						***
b. mak		*!				**	**
c. tsa.ma			*!			*	**
d. a.mak				*!		*	**
e.☞ʔa.mak					*		**
f. ʔa.ʔak					**!		*

However, the ranking is not fully able to account for bases of which the truncated forms are not *ʔVCV(C)* (33.3% in Piuma and 42.6% in Kaviangan), especially names with more than three syllables. Once the bimoraic requirement and morpheme realization are fulfilled, there is no need to drop place features, so an output form *CVCV(C)* wins out. In tableau (20), trisyllabic candidate (c) is ruled out because it is not the size of a foot. Candidate (b) incurs more violations of IDENT-BT(PLACE) because of the glottal stop. Thus candidate (a), which violates a lower-ranked MAX-BT, is therefore the optimal form.

(20) Failure to predict variations

/tsapadis/	REALMORPH	TRUNC=PRWD	ANCHOR-BT-R	ONSET	IDENT-BT(PL)	MAX-BT	*PLACE
a.☞ pa.dis						**	***
b.☹ ʔa.dis					*!	**	**
c.☹ ʔa.pa.dis		*!			*		***

Contrary to the results of the tableau above, both *CVCV(C)* and *ʔVCVCV(C)* with a sad face (☹) are also observed as truncated forms, though *ʔVCV(C)* is more common. Candidate (c) would be optimal if TRUNC=PRWD and IDENT-BT were demoted lower than MAX-BT, but candidate (b) does not have a chance to win no matter how the constraints are rearranged. The difference between (19) and (20) lies in the pressure to realize truncation for disyllabic bases while also fulfilling the minimal size. For base forms containing more than three syllables, once the higher-ranked size constraint is satisfied, it is unnecessary to incur more violations.

4.3 Discussion

Although the proposed constraint-based analysis accurately predicts the optimal form for 66.7% and 57.4% of the Piuma and Kaviangan data, respectively,

some details are worth noting, specifically regarding the complexity behind the regularity and the regularity among the exceptions. Furthermore, there are also rare cases of names with no truncated forms that have yet to be addressed.

Tables 1 and 2 clearly show that the majority of truncated forms are disyllabic, indicating the key role of size regulation in the truncation process. Disyllabic base names already meet this requirement, which explains why most (53.6% in Piuma and 50% in Kaviangan) are truncated as *ʔVCV(C)* (Type 1). As mentioned in Section 3.1, for disyllabic bases to be truncated, the only choice is to debuccalize the first consonant to [ʔ] while maintaining their original size. Longer base names, on the other hand, have more to sacrifice, and commonly truncate as Types 1 and 3, both of which are disyllabic. As for the names that have multiple truncated forms (Type 4), there is a clear preference for two syllables. The tendency for base names with three syllables to be shortened to two is highlighted in the tables below. These forms with variations, though few, demonstrate the importance of the two guiding principles: limit the size to a foot, change the initial consonant to a glottal, or both.

Table 1. The breakdown of truncations by syllable number in Piuma

Piuma	Type 1		Type 2		Type 3		Type 4.i		Type 4.ii		Type 4.iii	
Form	*ʔV.CV(C)*		*ʔV.CV.CV(C)*		*CV.CV(C)*		*ʔV.CV.CV(C)* & *ʔV.CV(C)*		*CV.CV(C)* & *ʔV.CV(C)*		*ʔV.CV.CV(C)* & *CV.CV(C)*	
Base σ	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+
Number	30	26	0	5	2	12	0	1	0	7	0	1
Total	56		5		14		1		7		1	

Table 2. The breakdown of truncations by syllable number in Kaviangan

Kaviangan	Type 1		Type 2		Type 3		Type 4.i		Type 4.ii		Type 4.iii	
Form	*ʔV.CV(C)*		*ʔV.CV.CV(C)*		*CV.CV(C)*		*ʔV.CV.CV(C) & ʔV.CV(C)*		*CV.CV(C) & ʔV.CV(C)*		*ʔV.CV.CV(C) & CV.CV(C)*	
Base σ	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+	2σ	3σ+
Number	18	18	0	3	2	13	0	0	0	7	0	1
Total	36		3		15		0		7		1	

It is worth noting that there are two cases in which a disyllabic base does not truncate by replacing the initial consonant with a glottal stop (underlines in the tables above). These are cases of fossilized reduplication (*kərkər* and *zuʌzuʌ*) in both dialects. They are classified as disyllabic based on the consultants' pronunciation, though some speakers produce such forms with an intervening vowel (usually a schwa) between two identical $C_1V_1C_2$ (e.g., *kərəkər*). These names truncated with fossilized reduplication demonstrate the tendency to delete the coda of the first syllable as $C_1V_1.C_1V_1C_2$ (i.e., *kərkər*→*kə.kər*, *zuʌzuʌ*→*zu.zuʌ*). However, not all names with fossilized reduplication follow this pattern. For example, in Piuma, the truncated forms for *lajlaj*, *masəgsəg*, and *vurvur* are *ʔilaj*, *ʔəgə*, and *ʔuvu*, respectively (rather than **lalaj*, **səsəg*, **vuvur*).

Finally, names without a truncated form, listed as Type 5 'No Truncation' in the Appendix, have not been addressed. There are multiple reasons for not having a truncated form. For one, some personal names such as *ariv*, *iriŋ* and *ərəŋ* (in Piuma) are too short to be further truncated. Other names lack truncated forms to avoid sounding like commonly-used lexicon or taboo words (e.g., genitalia). For example, the name *kui* has no truncated form (e.g. **ʔui*), probably because the word for 'yes' is *ui*. However, it is unclear why some names which could be shortened (e.g., *ɟaravak* in Piuma) lack a truncated form (e.g., **ʔavak* or **ravak*).

Though these minor factors may influence the truncation of a small number of names, the core principles remain.

5. Conclusion

This study has examined name truncation in Paiwan. Through revealing the regularities of the observed truncated forms, it has shown that different patterns of truncation are indeed phonologically grounded. First, the size of the truncated form must satisfy a minimum requirement. Truncated forms, like all prosodic words in Paiwan, must be at least two moras (i.e., one foot). Second, truncated forms often involve debuccalization of the initial consonant to [ʔ]. The comparison between examples of vowel hiatus and truncated names following vowels indicates that truncated names are formed by deriving a glottal stop from a consonant, rather than deleting the initial consonant. The glottal stop is thus regarded as the loss of oral gestures in order to realize truncation. These two guiding principles, however, are not always followed, resulting in truncated forms other than *ʔV.CV(C)*. Still, these variations (i.e., *ʔV.CV.CV(C)* and *CV.CV(C)*) follow at least one of the two principles.

Based on the observations drawn from the collected data, a constraint ranking incorporating the aforementioned factors was proposed. The ranking successfully accounts for *ʔV.CV(C)* being the most attested truncated form for disyllabic base names, but was unable to predict the different variations of truncation from bases with three or more syllables. In other words, the truncated disyllabic names pattern consistently, while longer bases are more subject to variations. These variations, however, still follow at least one of the guiding principles but not both. This study has contributed to the phonological study of truncation by collecting and analyzing firsthand data from Paiwan, an understudied Austronesian language in Taiwan.

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【**Appendix**】Four types of truncated names in Paiwan

The truncated forms presented in the followings are based on M1 from Piuma village and F1 from Kaviangan village. The data were crosschecked by the other consultants (M2 and F2) respectively.

Symbols used in Appendix	
Symbol	Representation
*	different truncated forms of the same full name in both dialects
#	specific usage for the consultant's family members only
✓	the truncated form provided by the second consultant is the same as that of the first one
φ	no truncated form for this full name
✕	no such full name in the village

Type 1. Glottal replacement in 2-syllable truncated form (*ʔV.CV(C)*)

Full name	*Piuma (M1)*	*Piuma (M2)*
a.ɭiŋ.ʔiŋ	ʔi.ʔiŋ	✓
t͡sa.mak	ʔa.mak	✓
t͡sa.pa.dis	ʔa.dis	✓
t͡sə.gav	ʔə.gav	✓
t͡sə.mə.das	ʔə.das	✓
ɭaj.ɭaj	ʔi.ɭaj	✓
li.ʎuk	ʔi.ʎuk	✓
ʎa.ʎuj	ʔa.ʎuj	φ
ʎa.u.tsu	ʔaw.tsu ʔu.tsu #	✓

Full name	*Kaviangan (F1)*	*Kaviangan (F2)*
a.ɭiŋ.ʔiŋ	ʔi.ʔiŋ	✓
t͡sa.mak	ʔa.mak	φ
t͡sa.pa.dis	ʔa.dis	✓
t͡sə.gav	ʔə.gav	✓
t͡sə.mə.dɑs	ʔə.das	✓
ɭaj.ɭaj	ʔi.ɭaj	✕
li.ʎuk	ʔi.ʎuk	✓
ʎa.ʎuj	ʔa.ʎuj	✓
ʎa.u.tsu	ʔaw.tsu	ʔu.tsu

ʃu.zəm	ʔu.zəm ʔi.zi #	✓ φ
mu.a.ka.i	ʔa.kaj	✓
pu.ʃa.ʃu.jan	ʔu.jan	✓
pa.ta.gav	ʔa.gav	✓
ri.pun	ʔipun	✓
ri.cak	ʔi.cak	✗
saŋ.kiʃ	ʔaŋ.kiʃ	✓
sə.ɟam	ʔə.ɟam	✓
sə.ɭəp	ʔi.pi *	✓
ca.nu.bak	ʔu.bak	✓
ca.mau.cuŋ	ʔu.cuŋ	✓
cu.ku	ʔu.ku	✓
va.vau.ni	ʔaw.ni	✓
və.nəŋ	ʔə.nəŋ	✓
zə.puʃ	ʔə.puʃ	✓
ɭaŋ.pav	ʔaŋ.pav *	✓
t͡sam.kim	ʔaŋ.kim *	✓
ɖa.ŋa.ɖaŋ	ʔa.ŋu *	✗
t͡sə.mə.ɭə.saj	ʔi.saj	ʔə.saj
ɖə.mə.ɖə.man	ʔi.man mi.mi # ʔi.mi #	ʔi.mi φ φ

ʃu.zəm	ʔu.zəm	✓
mu.a.ka.i	ʔa.kaj	✓
pu.ʃa.ʃu.jan	ʔu.jan	✓
pa.ta.gav	ʔa.gav	✓
ri.pun	ʔi.pun	✓
ri.tak	ʔi.tak	✓
saŋ.kiʃ	ʔaŋ.kiʃ	✓
sə.ɟam	ʔə.ɟam	✓
sə.ɭəp	ʔə.pə *	✓
tja.nu.bak	ʔu.bak	✓
ta.mau.tuŋ	ʔu.tuŋ	✓
tu.ku	ʔu.ku	✓
va.vau.ni	ʔaw.ni ʔu.ni *	φ φ
və.nəŋ	ʔə.nəŋ	✓
zə.puʃ	ʔə.puʃ	✓
ɭaŋ.pav	ʔu.pav *	✓
t͡sam.kim	ʔi.kim *	✓
ra.ŋa.raŋ	ʔa.raŋ *	✓
ɟa.ra.vak	ʔa.vak	✓
ʃa.va.kav	ʔa.kav	N.I.

ə.ʎa.jum	ʔa.jum ʔu.ʔiŋ #	φ φ
ʎa.va.us	ʔaws ʔaw #	✓ φ
ʎa.vi	ʔa.vi	✓
ʎaŋ.kui	ʔaŋ.kuj	✓
ʎi.uc	ʔju͡ts	φ
ɭu.an	ʔu.an	✓
ma.ʎəv.ʎəv	ʔi.ʎiv	✓
ma.ni	ʔa.ni	✓
ma.səg.səg	ʔə.gə	✓
mua.kaj	ʔa.kaj	✓
mu.ni	ʔu.ni	✓
ŋə.ɖəɭ	ʔə.ŋə	✕
pa.su.ɭaŋ	ʔu.aŋ	✓
ni.uŋ	ʔi.uŋ	φ
pa.tsak	ʔa.tsak	✓
pa.qə.ri.ras	ʔi.jas	✓
paŋ.cər	ʔi.ci	φ
pə.rə.saŋ	ʔə.saŋ	✓
qa.vus	ʔa.vus	✕
sa.u.ni.av	ʔaw.njav	✓
rə.ma.ʎiz	ʔa.ʎiz a.ʎi	✓ φ
sə.nəd	ʔə.nəd	✓
va.ʎa.kas	ʔa.kas	✓

ʎaj.kim	ʔi.kim	N.I.
ni.noŋ	ʔi.noŋ	✓
mu.ɟa.san	ʔa.san	ɟa.san
pa.u.ɭəs	ʔu.ɖəs	✓
ma.sə.gə.səg	ʔə.səg	gə.sə
ra.ŋa.ɭu	ʔa.ŋu	✓

va.ɭu.a.vu	ʔa.vu	✓
və.da.ʌan	ʔa.ʌan	✓
vi.kuŋ	ʔi.kuŋ	✓
vur.vur	ʔu.vu	✓

Type 2. Glottal replacement in 3-syllable truncated form (*ʔV.CV.CV(C)*)

Full name	*Piuma (M1)*	*Piuma (M2)*
ta.ka.nav	ʔa.ka.nav	✓
ʌa.ma.jav	ʔa.ma.jav ʔa.ma.ji #	✓ ʔa.jav
ʌa.va.kav	ʔa.va.kav	✓
sa.ki.nu	ʔa.ki.nu	✓
va.va.u.an	ʔa.vaw.wan	φ

Full name	*Kaviangan (F1)*	*Kaviangan (F2)*
ta.ka.nav	ʔa.ka.nav	ʔa.ka.nav ka.nav
t͡su.ga.gaŋ	ʔu.ga.gaŋ	φ
ma.səg.səg	ʔa.gə.sə	✓

Type 3. No glottal replacement in 2-syllable truncated form (*CV.CV(C)*)

Full name	*Piuma (M1)*	*Piuma (M2)*
a.si.an	ʃjan	φ
ga.ɭaj.gaj	ga.gaj	✓
giʎ.gi.ʎav	gjav	✓
kər.kər	ki.ki *	✓
kəm.ni.uŋ	njuŋ	✓
ʌa.ʌə.qə.ɭan	ʌi.ʔi	✓

Full name	*Kaviangan (F1)*	*Kaviangan (F2)*
a.si.an	ʃjan	✓
ga.ɭaj.gaj	ga.gaj	ga.gaj ʔa.gaj
giʎ.gi.ʎav	gjav	✓
kər.kər	kə.kər *	φ
kəm.ni.uŋ	nioŋ	✕
ʌa.ʌə.ʔə.ɭan	ʌə.ʔə	✓

ʎi.gi.an	gi.an	✓
ʎə.gi.aj	gi.aj	✓
zuʎ.zuʎ	zu.zuʎ	✓
sa.ki.ŋi	ki.ŋi	✓
ma.ɭa͡ts.ma͡ts	ma.ma͡ts	✓
a.ɖuaj	ɖwaj	φ
ɖa.ŋa.ɖaŋ	ɖa.ɖaŋ	✓
a.si.aŋ	ʃjaŋ	✕

ʎə.gə.an	gə.an	✓
ʎə.gə.aj	gə.aj	✓
zuʎ.zuʎ	zu.zuʎ	φ
sa.kə.ŋə	kə.ŋə	✓
paʔ.ri.ras	ri.as	✓
rə.mə.rə.man	ma.ni	ʔə.rəm
riɨ.sə.rəs	rə.rəs	✓
sa.ki.nu	ki.nu	φ
ʈʲi.vu.ɭu.an	vu.ru	✓

Type 4.i. Both ʔV.CV.CV(C) & ʔV.CV(C)

Full name	*Piuma (M1)*	*Piuma (M2)*
pu.ki.ri.ŋan	ʔi.ri.ŋan ʔi.ŋan	ʔu.ki.riŋ ki.riŋ

Kaviangan (F1)	*Kaviangan (F2)*
-----	-----

Type 4.ii. Both ʔV.CV(C) & CV.CV(C)

Full name	*Piuma (M1)*	*Piuma (M2)*
ɟu.pə.ɭaŋ	pi.aŋ ʔjaŋ	✓ ✓
ka.ɭəs.kəs	kə.kəs ʔə.kəs	✓ ✓
ʎa.vu.ras	ʔu.ʎaj ʎa.ʎa	ʔu.ʎas

Full name	*Kaviangan (F1)*	*Kaviangan (F2)*
ɟu.pə.ɭaŋ	pə.raŋ ʔə.raŋ	 ʔə.raŋ
ka.ɭəs.kəs	kə.kəs ʔə.kəs	✓ ✓
ʎa.vu.ras	vu.ras ʔu.ras	φ

ru.ta.mə.kan	ta.mək ʔa.mək	✓ ✓
a.ra.riv	ra.riv ʔa.riv	✓
rə.sə.rəs	rə.rəs ʔə.rəs	✓ ✓
t͡su.ga.gaŋ	ga.gaŋ ʔa.gaŋ	✓

ru.ta.mə.kan	ta.mək ʔa.mək	ta.mək
ma.ʎəv.ʎəv	ʎə.ʎəv ʔə.ʎəv	✓ ✓
ʎa.va.us	vaws ʔaws	✓
sa.u.ni.av	ʔaw.njav njav	 njav

Type 4.iii. Both ʔV.CV.CV(C) & CV.CV(C)

Full name	*Piuma (M1)*	*Piuma (M2)*
ku.ʎə.ʎə	ʔu.ʎə.ʎə ʎi.ʎi	✓ ✓

Full name	*Kaviangan (F1)*	*Kaviangan (F2)*
ku.ʎə.ʎə	ʔu.ʎə.ʎə ʎə.ʎə	✓ ✓

Type 5. No truncation

Full name in Piuma
a.riv
ku.i
i.riŋ
ə.ləŋ
ɟa.ra.vak
ʎaj.kim

Full name in Kaviangan
a.riv
ku.i
a.ru.aj
ba.ru
ku.aʎ
ə.ʎa.jum
ma.ni
t͡sə.mə.l̪ə.saj
ʎa.vi

mu.ni
pa.su.ɭaŋ
pər.saŋ
pu.ki.ri.ŋan
rə.ma.ʎiz
sə.nəd
vi.kuŋ
vur.vur

排灣語人名截短詞初探

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本研究藉由第一手語料探討平和排灣與佳平排灣的人名截短形式，並聚焦於此語言的音韻規則與限制。大多數的截短形式皆受兩原則所規範：第一，截短詞的大小需符合最小韻律詞也就是一個韻步的限制；第二，字首輔音由喉塞音取代，以*ʔV.CV(C)*的形式出現。然而其他形式的截短詞顯示同時滿足這兩條原則並非必要，有些只遵守大小的限制，以*CV.CV(C)*的樣子出現，有些則遵從字首為喉塞音的限制，以*ʔV.CV.CV(C)*的樣貌顯現。其他更少見的截短形式為前述三者的任意結合。本研究以優選理論分析最常見的截短形式如何由限制雙音拍大小的制約與要求去除口腔發音部位的制約互動而來。同時，無法順利預測其他類別的截短詞也顯示了排灣語對此構詞形式的制約排序並不緊密，因此允許不同的自由形式存在。

關鍵詞：截短形式、自由變體、韻律詞、喉塞音替換、台灣南島語