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OPTIONAL PARTIAL METATHESIS IN KWARA'AE*

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In Kwara'ae, underlying /C1V1C2V2/ is pronounced [C1V1V2C2]; i.e. there is a robust process of CV metathesis. Optional partial metathesis (e.g. /C1V1C2V2/ is realized either as [C1V1V2C2V2] or as [C1V1C2V2]) occurs in words at the right edge of a focused phrase. These words, called Focus Final forms, place primary stress, which normally occurs word-initially, word-finally. Following Blevins and Garrett (1998) who argue that full CV metathesis is a process of copy and deletion of V2, I argue that partial metathesis results from its deletion being blocked by the final stress. Finally, I suggest that this process occurs optionally because of speakers sometimes prefer the nuclei of the Focus Final forms to be similar to the corresponding nuclei in regular speech.

1. INTRODUCTION

Words in Kwara'ae (Austronesian: Southeastern Solomonic) have two pronunciations, one for each speech register; these are called the Citation and Normal forms. These registers are related by CV metathesis: a process in which $C_1V_1C_2V_2$ sequences in the Citation form are $C_1V_1V_2C_2$ sequences in the Normal form. In (1), underlined segments in the Citation form are metathesized in the Normal form.

(1)

	Citation	Normal	
a.	ˈsi.na	ˈsi̯ɛn	'sun'
b.	bo.ˈbe.ʔa	ˈbo̯.ˌbe̯aʔ	'fat
c.	ˈʔi.fi.ˌte.ʔi	ˈʔiˑh.ˌtei̯ʔ	'bed'[1]
d.	da.ˈro.ʔa.ˌni.da	ˈdao̯r.ʔa.ˌni̯ɛd	'to share them'
e.	ˈra.ʔe.ˌra.ʔe.ˌna.ʔa	ˈrae̯ʔ.ˌrae̯ʔ.ˌnaˑʔ	'incline, slope'

The Normal form is the speech register used in normal discourse.[2] The Citation form is the speech register used in traditional songs and for clarification.[3] Gegeo and Watson-Gegeo (1986)

*All the data in this paper, except where noted, comes from Sophie Streeter, a native speaker of Kwara'ae, to whom I extend my deepest gratitude. I also sincerely thank Kie Zuraw, Bruce Hayes, and Colin Wilson for useful comments.

[1] Citation [f] is regularly realized as Normal [h].

[2] The Normal form has also been called the short form (Sohn 1980) and the discourse form (Norquest 2001).

[3] The Citation form has also been called the long form (Sohn 1980), historical form (Simons 1977, Blevins and Garrett 1998), or underlying form (Sohn 1980, Gegeo and Watson-Gegeo 1986).

write that these forms are also used in alternation in calling out routines (a ritualized, songlike speech style).

1.1. Purpose

The purpose of this paper is to introduce a third previously unnoticed allomorph, which I call the Focus Final form. There are two variants of the Focus Final Form, examples of which are given below.

(2)		Citation	Normal	Focus Final 1	Focus Final 2	
	a.	ˈle.ʔa	ˈlea̯ʔ	ˌlea̯.ˈʔa	ˌle.ˈʔa	‘good’
	b.	ˈsi.na	ˈsi̯ɛn	ˌsi̯ɛ.ˈna	ˌsi.ˈna	‘sun’
	c.	ˈʔi.fi.ˌte.ʔi	ˈʔi̯ˑh.ˌtei̯ʔ	ˌʔi̯ˑh.ˌtei̯.ˈʔi	ˌʔiˑh.te.ˈʔi	‘bed’

Note that the Focus Final 2 form is distinct from the Citation form not just in terms of stress, but also in the linear order of its segments as demonstrated by ‘bed’ (2c). In this paper, I will describe the environment where this allomorph occurs, its relevant surface properties as well as provide an analysis of these properties. I will refer to the Focus Final Form 1 (FF1) as the “Partial metathesis Form” and the Focus Final Form 2 (FF2) as the “Blocked metathesis Form.” For now these names can be thought of as arbitrary labels, though later I will justify the use of these terms.

1.2. Basic Analysis CV Metathesis

Previous research has argued that locations of CV metathesis in the Normal register are primarily determined by the stress pattern (Laycock 1982, Blevins and Garrett 1998, Norquest 2001, Heinz 2004).[4] More specifically, in a language like Kwara’ae, the segments of a CV syllable are subject to metathesis if they follow a stressed CV syllable.

The Stress to Weight Principle and Linearity

CV metathesis occurs in the Normal form because the Normal form obeys the Stress to Weight Principle, which says that stressed syllables should be heavy. In other words, the Stress to Weight Principle outranks LINEARITY, the faithfulness constraint which encourages segments to maintain their underlying order. (Norquest 2001, Heinz 2004).

(3) **SWP** incurs a violation for each stressed light syllable in the output.

[4]To my knowledge the first suggestion that CV metathesis is conditioned by the stress pattern occurs in an addendum in Laycock (1982) and is attributed to Gary Simons, a Kwara’ae researcher, cf. Simons (1977).

(4) **Linearity** incurs a violation for each segment in the output that precedes a segment that it succeeded in the input and vice versa (No metathesis).[5]

This ranking captures why CVCV sequences are virtually absent in the Normal form; it is more important for the language for stressed syllables to be heavy than to be faithful to the linear order of the input.

(5)

/sina/		SWP	LINEARITY
☞	a. ˈsiɛn		*
	b. ˈsi.na	*!	

2. THE THIRD ALLOMORPH – FOCUS FINAL FORM

Turning to the Focus Final Forms, I will first demonstrate where this allomorph occurs. Then I will identify its relevant phonological properties, and give an analysis based on the basic one above.

2.1. Distribution

Kwara'ae is an SVO language.

(6) kiɛr so.ŋei ʔ leaʔ [na ˈʔiˑh.ˌtei ʔ].
they make well the bed
They skillfully built the bed.

Focus position in Kwara'ae is akin to the position of a clefted phrase in English; i.e. it occurs before the subject of the verb. The Focus Final Form (in bold) is the last word of a phrase in focus position in Kwara'ae.

(7) [na ˌʔiˑh.ˌtei.ˈʔi] neˑʔ kiɛr so.ŋei ʔ leaʔ an.
the bed that they make well to
It is the bed that they skillfully built.

That the Focus Final Form is is the last word of a clefted phrase follows when one considers focused objects with adjectives, which follow the noun. (9) gives the SVO sentence, and (9) is its

[5]As described in Hume (2001) and Heinz (to appear), if the metathesizing segments are not adjacent, further violations are scored.

clefted equivalent.

(8) kiɛr so.ŋeiʔ leaʔ [na ʔiˈh.teiʔ ˈkuˈl].
they make well the bed heavy
They skillfully built the heavy bed.

(9) [na ʔiˈh.teiʔ ˌkuˈ.ˈlu] neˈʔ kiɛr so.ŋeiʔ leaʔ an.
the bed heavy that they make well to
It is the heavy bed that they skillfully built.

Not only has the last word in the object phrase changed pronunciation in (9), but the word for ‘bed’ [ʔiˈh.teiʔ] is pronounced normally. Another set of examples is given below.

(10) niaˈʔ ʔain na baɐ.naˈh kʷaˈs ma ka ˈgʷair
He ate the pineapple ripe and non-future cold
He ate the cold ripe pineapple.

(11) [na ˈbaɐ.ˌnaˈ.ˈha] neˈʔ niaˈʔ ʔain
the pineapple that he ate
It’s the pineapple that he ate.

(12) [na baɐ.naˈh ˌkʷaˈ.ˈsa] neˈʔ niaˈʔ ʔain
the pineapple ripe that he ate
It’s the ripe pineapple that he ate.

(13) [na baɐ.naˈh kʷaˈs ma ka ˌgʷai.ˈri] neˈʔ niaˈʔ ʔain
the pineapple ripe and non-future cold that he ate
It’s the cold ripe pineapple that he ate.

All of the above examples exhibit the Partial Metathesis (FF1) form, but the Blocked Metathesis form (FF2) could have occurred in its place equally well. In other words, which variant occurs is optional. Impressionistically, the Partial Metathesis Form (FF1) occurs more frequently than the Blocked Metathesis Form (FF2), but I have insufficient data on this point to make this a substantial claim. They are, however, clearly both grammatical in this position. Finally, since the Focus Final Forms occur in Normal discourse, I assume it belongs to the Normal register.

2.2. Phonological Properties

Below the additional examples in (14), I describe the relevant phonological properties.

(14)

	Citation	Normal	Focus Final 1	Focus Final 2	
a.	ˈku.lu	ˈkuˑl	ˌkuˑ.ˈlu	ˌku.ˈlu	'heavy'
b.	ˈgʷa.ri	ˈgʷai̯r	ˌgʷai̯.ˈri	ˌgʷa.ˈri	'cold'
c.	ˈkʷa.sa	ˈkʷaˑs	ˌkʷaˑ.ˈsa	ˌkʷa.ˈsa	'ripe'
d.	ˈbae̯.ˌna.fa	ˈbae̯.ˌnaˑh	ˌbae̯.ˌnaˑ.ˈha	ˌbae̯.na.ˈha	'pineapple'
e.	ˈʔi.fi̯.ˌte.ʔi	ˈʔiˑh̯.ˌtei̯ʔ	ˌʔiˑh̯.ˌtei̯.ˈʔi	ˌʔiˑh̯.te.ˈʔi	'bed'
f.	ˈsi.na	ˈsi̯ɛn	ˌsi̯ɛ.ˈna	ˌsi.ˈna	'sun'
g.	fi.ˈʔi.ta.ˌta.li	ˈhi̯ˑʔ.ta.ˌtei̯l	ˌhi̯ˑʔ.ta.ˌtei̯.ˈli	ˌhiˑʔ.ˌta.ta.ˈli	'hibiscus (bush)'
h.	ˈbu.lu.ˌbu.lu	ˈbuˑl.ˌbuˑl	ˌbul.ˌbuˑ.ˈlu	ˌbuˑl.bu.ˈlu	'star'

Main stress falls on the final syllable of the Focus Final form in both variants. There is no metathesis finally in the Blocked Metathesis Form (FF2).

In the Partial Metathesis Form (FF1), the vowel qualities of the last two vowels are not independent from each other. The following table summarizes how the diphthong in the Normal form is predictably derived from two vowels from the set [i,u,e,o,a].

(15)

V_1V_2		V_2				
		i	u	e	o	a
V_1	i	iˑ	i̯u	⊘	i̯o	i̯ɛ
	u	u̯i	uˑ	u̯ɛ	⊘	u̯ʌ
	e	ei̯	eu̯	ɛˑ	e̯o	e̯a
	o	oi̯	ou̯	o̯e, u̯e	ɔˑ	o̯a
	a	a̯i, ei̯, eˑ	a̯u, oˑ	æ, a̯e	a̯o	aˑ

⊘ = *unattested*

Nuclei following a ',' occur in fast speech

The most represented member of each cell in (15) is associated with a unique V_1V_2 pair.[6] However, if we consider the free variation and the lexical exceptions, this is no longer the case. For example an /ai/ combination in fast speech may be pronounced in the same manner as an underlying /ei/ combination, or the same as vowel found in the lexical exception [ˈneˑʔ] 'that' (cf. Citation [ˈne.ʔe]). To my ear, the nuetralization appears complete in such cases, though whether or not it

[6]This raises the possibility that the V_1 and V_2 are recoverable from the diphthong which in turn begs the question whether speakers can "undo" metathesis.

truly is would have to be subjected to rigorous phonetic examination.

In the Partial Metathesis form then, the quality of the second element of the diphthong before the final vowel is predictable from the first element of the diphthong and the final vowel. Similarly, the final vowel is predictable from the preceding diphthong. This suggests that in the Partial Metathesis Form (FF1), the final vowel and the second element of the preceding diphthong are derived from the same vowel.

3. Analysis of the Focus Final Form

Blevins and Garrett (1998) suggest that CV metathesis is a diachronic process of copy and deletion:[7]

(16) $C_1V_1C_2V_2 > C_1V_1V_2C_2V_2 > C_1V_1V_2C_2$

With this perspective, the Partial Metathesis Form (FF1) then appears to exhibit partial metathesis; i.e. the copying but not the deletion. The Blocked Metathesis Form (FF2) also does not exhibit the deletion, but neither does it exhibit the copying.

Thus, there are three questions. Why is there no deletion in the both Focus Final Forms? Why is there copying in the Partial Metathesis Form (FF1), but not in the Blocked Metathesis Form (FF2)? How can the analysis capture this optionality?

The above facts, together with the observation in the literature that CV metathesis is a stress-conditioned phenomena, suggest that the focus final stress pattern blocks complete CV metathesis at the right edge of the word.

Since Focus Final forms belong to the Normal form, the basic ranking SWP $\gg$ Linearity is assumed to hold.

3.1. The Moraic Grid (Prince 1983)

I use a moraic analysis, where light syllables (CV) project one mora, and heavy syllables (CVV, CVC, etc.) project two.[8] A mora is represented by level 0 in moraic grid. Secondary stress is level 1, primary stress is level 2, and phrasal stress in level 3. Example: Citation form [ˈke.ta.ˌla.ku] is represented like this:

[7] Blevins and Garrett (1998) give some evidence from Kwara'ae to support this hypothesis. Transcriptions from Andrew Pawley circa 1982 have some Normal forms as [$C_1V_1V_2C_2\underset{\circ}{V}_2$]. The speaker I worked with exhibited a different distribution of voiceless vowels, see Heinz (2004) for details.

[8] Justification for a weight distinction in Kwara'ae is given in Heinz (2004).

(17)

2	x			
1	x		x	
0	x	x	x	x
	ke	ta	la	ku

Following Prince (1983), heavy syllables cannot bear X1 grid marks on its weak mora; e.g. Normal ['si̯ɛn] 'sun' must be represented as in (18), and not as in (19) or (20).

(18)

2		x		
1		x		
0		x	x	
	s	i̯	ɛ	n

(19) *

2			x	
1			x	
0		x	x	
	s	i̯	ɛ	n

(20) *

2		x	x	
1		x	x	
0		x	x	
	s	i̯	ɛ	n

3.2. Focus-Stress and Integrity

To capture the location of main stress in Focus Final forms, I assume there is a constraint called FOCUSSTRESS which requires placement of stress next to the rightmost focus-phrase boundary:

(21) **Focus-Stress** incurs a violation for every X0 grid mark between the right focus boundary and an X3 grid mark, or, if there are no X3 gridmarks, then every X0 grid mark incurs a violation (place phrasal stress on the mora closest to the right focus boundary).

I also assume that, in the Partial Metathesis Form (FF1), the final vowel and the second element of the diphthong are derived from the same underlying vowel, in violation of INTEGRITY (McCarthy and Prince 1995).

(22) **Integrity** incurs a violation for every pair of segments in the output which correspond to the same segment in the input.

3.3. Why There Is No Deletion

With these constraints in mind, it is now possible to see why deletion does not occur in the Focus Final forms. FOCUS-STRESS is high ranked so that it forces a stressed syllable word-finally in the focus final position, in violation of SWP. Consider *sina* 'sun'.

(23)

/sina]$_{focus}$/	FOCUS-STRESS	INTEGRITY[9]	SWP	LINEARITY
☞ a. x x / x x / x x / ˌsi.ˈna			**	
b. x x / x x / xx x / ˌsiˑɛ.ˈna		*	*	*
c. x / x / x / xx / ˈsiˑɛn	*!			*

Candidates like [ˈsiˑɛn] are eliminated because the weak mora of a heavy syllable cannot bear stress (Prince 1983). As a result, deletion (and thus complete metathesis) is blocked word-finally (Final Focus Form 2).

3.4. Why There Is Copying

It remains to be explained why is there optional partial metathesis. What motivates copying in Focus Final Form 1? Why sometimes [ˌsiˑɛ.ˈna] as opposed to [ˌsi.ˈna]? I argue that the optional Partial Metathesis Form (FF1) is a consequence of paradigm uniformity, which can be modeled with Output-to-Output (OO) correspondance constraints. In other words, partial metathesis occurs to make the Focus Final Form more similar to the Normal form. In particular, I suggest that contiguous vowels in the Normal elsewhere form should be contiguous in the Partial Metathesis Form (FF1).

(24) **OO V-V Contiguity** incurs a violation if a V_1 immediately precedes V_2 in the Normal form, but the segment corresponding to V_1 in the Focus Final form does not immedi-

[9] INTEGRITY ≫ SWP since partial metathesis is not a solution Stress to Weight Principle elsewhere in the language. Recall *bobe'a* 'fat' Normal [ˈbo.ˌbeˑa?] Citation [bo.ˈbe.ʔa], not Normal [ˈboˑe.ˌbeˑa?].

ately precede the segment corresponding to V_2 in the Focus Final form. (Contiguous vowels in the Normal form must be contiguous in the Focus Final Form.)

This constraint ensures that contiguous vowels in the Normal elsewhere form are present in the Focus Final form; e.g. the Partial Metathesis form (FF1) of *sina* 'sun' [ˌsi̯ɛ.ˈna] has the same contiguous vowels of the Normal form [si̯ɛn].

(25)

/si$_1$na$_2$]$_{focus}$/, Normal [ˈsi̯ɛn]	FOCUS-STRESS	OO VVCONTIG	INTEGRITY
☞ a. x x x x x x / s i̯$_1$ ɛ$_2$. n a$_2$			*
b. x x x x x / s i̯$_1$. n a$_2$		*!	
c. x x x x x x / s i̯$_1$ ɛ$_2$. n a$_2$	*!*		*

This constraint applies *optionally*. When it occurs and outranks INTEGRITY, Final Focus Form 1 is the winner; when it does not, Focus Final Form 2 is the winner. The variation that is observed can either be implemented optionally, or as a stochastic ranking between OO V-V CONTIGUITY and INTEGRITY (Boersma 1997, 1998, Boersma and Hayes 2001).

To summarize, metathesis is blocked in the final CV syllable of an underlying form because of the final stress due to the word's syntactic position. Partial metathesis occurs optionally because of a single constraint which represents the speaker's preference for Focus Final Forms to have the same contiguous vowels as their counterpart Normal forms.

3.5. Undoing Metathesis

The obvious alternative to the output-to-output correspondance constraint above is stratal Optimality Theory (Kiparsky 2000). In this theory, the output at the lexical level forms the input to the post-lexical level. The Focus Final Forms must be derived post-lexically since they are sensitive to a syntactic context.

Thus, the post-lexical level would have to "undo" the metathesis that occurred at the earlier stages: /sina/ → [si̯ɛn] → [ˌsi̯ɛ.ˈna] or [ˌsi.ˈna].

This issue is not unique to this Kiparskian analysis. It is present in the analysis given here

as well. Under the notion of a rich base, one must consider inputs which resemble the Normal form; e.g. /siɛn/. How does this UR become Focus Final Form 1 [ˌsiɛ̂.ˈna] or Focus Final Form 2 [ˌsi.ˈna]? Similarly, if we consider the Citation grammar, how does a UR like /siɛ̂n/ derive the Citation [ˈsi.na]? It seems that many analyses require that the grammar undo metathesis.

The key to knowing whether this can be done revolves on the recoverability of the vowels from the diphthong. This is in principle possible, provided there is no nuetralization in diphthong formation. This may indeed be the case – each cell in the table (15) is basically unique. However, more evidence is welcome on this point. Speakers providing Citation forms for novel Normal form words would constitute one type of evidence. More knowledge about the gaps may also be promising. For example, what if the gaps in the table are not accidental but the result of speakers "undoing" metathesis despite neutralization. E.g. if /ie/ was realized as [i͡ɛ], speakers may have consistently mistakenly "undid" this as /ia/. Comparative evidence may shed light on this possibility.

4. Conclusion and Summary

There is a third allomorph in the Normal register of Kwara'ae, the Focus Final Form. This allomorph is the last word of a focused (i.e. clefted) phrase. This form has two variants, one with partial metathesis, and one without. In both variants, deletion of the final vowel is blocked because phrasal stress is required to fall as close to the right focal boundary as possible and stress cannot fall on the weak mora of a syllable. All of the above follows from the aforementioned hypothesis that stress conditions the locations of CV metathesis. Copying in the Focus Final Form 1 cannot occur for the same reason metathesis occurs elsewhere in Kwara'ae; instead, it occurs in order to be faithful to contiguous vowels in Normal form. These forms also indicate a direction for future research – the capacity of a Kwara'ae speaker to "undo" metathesis.

Appendix: Voiceless Vowels in the Normal form

Blevins and Garrett (1998) give some evidence from Kwara'ae to support this hypothesis. Transcriptions from Andrew Pawley circa 1982 have some Normal forms as [$C_1V_1V_2C_2\underset{\circ}{V}_2$].

In this data, voiceless vowels occur in the Normal form following any consonant except nasals, as long as V_2 is higher or the same height as V_1, which is the case in (26), but not in (27), which are taken from Blevins and Garrett (1998, p. 530).

(26)	Citation	Normal	
	fusi	huis̥i	'cat'
	kado	kaodo̥	'thin'
	sata	saˈtḁ	'name'

(27)

Citation	Normal	
lifa	liəh	'teeth'
uta	wət	'rain'
ʔasufe	ʔasuəh	'rat'

I found a different distribution of voiceless vowels. In my data, they occur optionally in the Normal form, primarily word finally after the laryngeals [ʔ] and [h], and somewhat less regularly word-finally after the continuants [l] and [s], and nowhere else. Relative vowel height does not matter, cf. 'stealing' and 'always'.

(28)

	Citation	Normal	
a.	bi.ˈli.ʔa	ˈbi.ˌliɛ̯ʔɛ̯	'stealing'
	ˈi.du.ˌfa.ʔi	ˈi̯ud.ˌhei̯ʔɪ̯	'always'
	ˈma.ʔu	ˈmau̯ʔu̯	'fear'
	ˈu.ʔa	ˈu̯ɛʔɛ̯	'crab'
b.	ˈʔa.fe	ˈʔae̯he̯	'wife'
	ˈka.fo	ˈkao̯ho̯	'water'
	ka.ˈta.fo	ˈka.ˌtao̯ho̯	'papaya'
c.	ˈbu.su	ˈbuˑsu̯	'to burst'
	li.ˈmau.ˌmu.lu	ˈli.mau.ˌmuˑlu̯	'your (pl.) hands'

The overall picture, however, is in line with Blevins and Garrett's (1998) claim that the voiceless vowels are a residue of the former vowel. The speaker I work with most likely belongs to the next generation of speakers than the ones Pawley worked with over twenty years ago. Because her speech contains optional voiceless vowels in fewer positions overall, its reasonable that her speech pattern reflects another stage of the decline of the final vowel.

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