

CV Metathesis as Copy and Deletion: Evidence from Kwara'ae

1 Introduction

Kwara'ae (Austronesian: Southeastern Solomonic) has a robust process of CV metathesis (see below). All the data in this handout, except where noted, comes from Sophie Streeter, a native speaker of Kwara'ae, to whom I extend my deepest gratitude.¹

Words in Kwara'ae 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.

Examples. Underlined segments in the Citation form are metathesized in the Normal form.

(1)	Citation	Normal	
a.	' <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u>
b.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>
c.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>
d.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>
e.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>

1.1 Purpose

Present a third previously unnoticed allomorph, which I call the Focus Final form.

(2)	Citation	Normal	Normal _{focus}	
a.	' <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u>
b.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>
c.	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>	' <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u> . <u>ka.ka</u>

Describe the environment where this allomorph occurs, and its relevant surface properties.

Provide a synchronic analysis of the phonological properties of the Focus Final form.

1.2 Background

The Normal form is the speech register used in normal discourse.²

¹I also sincerely thank my advisor Kie Zuraw and the other members of my MA committee Bruce Hayes and Pam Munro. They have each contributed significantly to this work. I also would like to thank Colin Wilson, Donca Steriade, Jaye Padgett, Andy Martin, Katya Petrosova, Greg Kobele, Leston Buell, Jason Riggle, Lauren Varner and all the members of the Fall 2004 UCLA Phonology Seminar for their time and insights.

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

The Citation form is the speech register used in traditional songs and for clarification.³ Gegeo and Watson-Gegeo (1986) write that these forms are also used in alternation in calling out routines (a ritualized, songlike speech style).

Previous research has argued that locations of CV metathesis in the Normal register are conditioned by the stress pattern (Laycock 1982, Blevins and Garrett 1998, Norquest 2001, Heinz 2004).


2 The Third Allomorph Focus Final Form

First, I will demonstrate where this allomorph occurs.

Second, I will identify its relevant phonological properties.

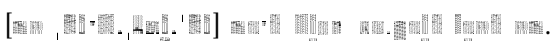
2.1 Distribution

Kwara'ae is SVO.



- (3) 
 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.

- (4) 
 the bed that they make well to
 It is the bed that they skillfully built.

We can see that it is the last word of a clefted phrase by considering focused objects with adjectives, which follow the noun.

- (5) 
 they make well the bed heavy
 They skillfully built the heavy bed.
- (6) 
 the bed heavy that they make well to
 It is the heavy bed that they skillfully built.

Another set of examples is given below.

- (7) 
 He ate the pineapple ripe and non-future cold
 He ate the cold ripe pineapple.

³The 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).

- (8) [the pineapple that he ate] the pineapple that he ate.
It's the pineapple that he ate.
- (9) [the pineapple ripe that he ate] the pineapple ripe that he ate.
It's the ripe pineapple that he ate.
- (10) [the pineapple ripe and non-future cold that he ate] the pineapple ripe and non-future cold that he ate.
It's the cold ripe pineapple that he ate.

Since the Focus Final Form occurs in Normal discourse, I assume it belongs to the Normal register.

2.2 Phonological Properties

Examples:

(11)	Citation	Normal	Normal] _{focus}	
a.	'heavɪ	'heavɪ	'heavɪ	heavy
b.	'cɒld	'cɒld	'cɒld	cold
c.	'riːp	'riːp	'riːp	ripe
d.	'paɪnəpl	'paɪnəpl	'paɪnəpl	pineapple
e.	'dɛd	'dɛd	'dɛd	dead
f.	'ʌn	'ʌn	'ʌn	un
g.	'bɪsɪs (bʊʃ)	'bɪsɪs (bʊʃ)	'bɪsɪs (bʊʃ)	bibiscus (bush)
h.	'fɑː	'fɑː	'fɑː	far

Main stress falls on the *Val* syllable of the Focus Final form.

The vowel qualities are not independent from each other. See Appendix A for a vowel chart.

$\frac{1}{2}$ The quality of the second element of the diphthong before the *Val* vowel is predictable from the *Val* element of the diphthong and the *Val* vowel.

$\frac{1}{2}$ Similarly, the *Val* vowel is predictable from the preceding diphthong.

This suggests they are derived from the same vowel.

It is noteworthy that Blevins and Garrett (1998) suggest that CV metathesis is a diachronic process of copy and deletion:⁴

$$(12) \quad C_1V_1C_2V_2 > C_1V_1V_2C_2V_2 > C_1V_1V_2C_2$$

Thus, the third allomorph appears to exhibit partial metathesis; i.e. the copying but not the deletion.⁵

⁴Blevins and Garrett (1998) give some evidence from Kwaráae to support this hypothesis. Transcriptions from Andrew Pawley circa 1982 have some Normal forms as [C₁V₁V₂C₂V₂]. See Appendix B.

⁵I have recently learned that the partial metathesis is in fact optional. In other words, *sina* *ounon* may be pronounced [sɪnɔ. 'ounon] as a Final Focus form. This talk does not address Focus Final forms like [sɪnɔ. 'ounon], though the analysis presented readily extends to this case.

3 Analysis of the Focus Final Form

The above facts, together with the observation in the literature that CV metathesis is a stress-conditioned phenomena (Blevins and Garrett 1998, Norquest 2001, Heinz 2004), suggest that the focus stress pattern blocks complete CV metathesis at the right edge of the word.



There are two questions:

- ½ Why is there no deletion?
- ½ Why is there copying?

3.1 Basic Ingredients

3.1.1 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. 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.



Following Prince, heavy syllables cannot bear X1 grid marks on its weak mora; e.g. Normal
 but not *.

3.1.2 Complete CV Metathesis

CV metathesis occurs in the Normal form because stressed syllables should be heavy. In other words, the Stress to Weight Principle outranks Linearity (Norquest 2001, Heinz 2004).

- (13) **SWP** incurs a violation for each stressed light syllable in the output.
- (14) **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).⁶

(15)

	/nɔrml/	SWP	Linearity
a.			
b.		!	

3.1.3 Focus-Stress and Integrity

I assume there is a constraint regulating placement of stress next to the rightmost focus-phrase boundary:

- (16) **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).

⁶This is the formal definition, but I will score violations by instances of metathesis. As in Hume (2001), if the metathesizing segments are not adjacent, further violations are scored.




⁷Heinz (2004) gives reasons why we should consider underlying forms to be like /nɔrml/.

I'd assume that the *ya* vowel and the second element of the diphthong are derived from the same underlying vowel, in violation of Integrity (McCarthy and Prince 1995).

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

3.2 Why There Is No Deletion

Focus-Stress is high ranked so that it forces a stressed syllable word-finally in the focus position, in violation of SWP. Consider *sina* ¹⁰⁰ ₁₀₀

/ ] <i>focus</i> /		Focus-Stress	Integrity	SWP	Linearity
(18)	♥ a.				
	b.		!		

$\begin{matrix} \text{X} \\ \text{X} \\ \text{X} \\ \text{XX} \\ \text{XX} \end{matrix}$
Candidates like $[\text{ʔ} \text{ʔ} \text{ʔ} \text{ʔ}]$ 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.

3.3 Why There Is Copying

Why is there partial metathesis? I.e. What motivates copying? Why not [X₁ X₂ X₃ X₄ X₅ X₆ X₇ X₈ X₉ X₁₀ X₁₁ X₁₂ X₁₃ X₁₄ X₁₅ X₁₆ X₁₇ X₁₈ X₁₉ X₂₀ X₂₁ X₂₂ X₂₃ X₂₄ X₂₅ X₂₆ X₂₇ X₂₈ X₂₉ X₃₀ X₃₁ X₃₂ X₃₃ X₃₄ X₃₅ X₃₆ X₃₇ X₃₈ X₃₉ X₄₀ X₄₁ X₄₂ X₄₃ X₄₄ X₄₅ X₄₆ X₄₇ X₄₈ X₄₉ X₅₀ X₅₁ X₅₂ X₅₃ X₅₄ X₅₅ X₅₆ X₅₇ X₅₈ X₅₉ X₆₀ X₆₁ X₆₂ X₆₃ X₆₄ X₆₅ X₆₆ X₆₇ X₆₈ X₆₉ X₇₀ X₇₁ X₇₂ X₇₃ X₇₄ X₇₅ X₇₆ X₇₇ X₇₈ X₇₉ X₈₀ X₈₁ X₈₂ X₈₃ X₈₄ X₈₅ X₈₆ X₈₇ X₈₈ X₈₉ X₉₀ X₉₁ X₉₂ X₉₃ X₉₄ X₉₅ X₉₆ X₉₇ X₉₈ X₉₉ X₁₀₀ X₁₀₁ X₁₀₂ X₁₀₃ X₁₀₄ X₁₀₅ X₁₀₆ X₁₀₇ X₁₀₈ X₁₀₉ X₁₁₀ X₁₁₁ X₁₁₂ X₁₁₃ X₁₁₄ X₁₁₅ X₁₁₆ X₁₁₇ X₁₁₈ X₁₁₉ X₁₂₀ X₁₂₁ X₁₂₂ X₁₂₃ X₁₂₄ X₁₂₅ X₁₂₆ X₁₂₇ X₁₂₈ X₁₂₉ X₁₃₀ X₁₃₁ X₁₃₂ X₁₃₃ X₁₃₄ X₁₃₅ X₁₃₆ X₁₃₇ X₁₃₈ X₁₃₉ X₁₄₀ X₁₄₁ X₁₄₂ X₁₄₃ X₁₄₄ X₁₄₅ X₁₄₆ X₁₄₇ X₁₄₈ X₁₄₉ X₁₅₀ X₁₅₁ X₁₅₂ X₁₅₃ X₁₅₄ X₁₅₅ X₁₅₆ X₁₅₇ X₁₅₈ X₁₅₉ X₁₆₀ X₁₆₁ X₁₆₂ X₁₆₃ X₁₆₄ X₁₆₅ X₁₆₆ X₁₆₇ X₁₆₈ X₁₆₉ X₁₇₀ X₁₇₁ X₁₇₂ X₁₇₃ X₁₇₄ X₁₇₅ X₁₇₆ X₁₇₇ X₁₇₈ X₁₇₉ X₁₈₀ X₁₈₁ X₁₈₂ X₁₈₃ X₁₈₄ X₁₈₅ X₁₈₆ X₁₈₇ X₁₈₈ X₁₈₉ X₁₉₀ X₁₉₁ X₁₉₂ X₁₉₃ X₁₉₄ X₁₉₅ X₁₉₆ X₁₉₇ X₁₉₈ X₁₉₉ X₂₀₀ X₂₀₁ X₂₀₂ X₂₀₃ X₂₀₄ X₂₀₅ X₂₀₆ X₂₀₇ X₂₀₈ X₂₀₉ X₂₁₀ X₂₁₁ X₂₁₂ X₂₁₃ X₂₁₄ X₂₁₅ X₂₁₆ X₂₁₇ X₂₁₈ X₂₁₉ X₂₂₀ X₂₂₁ X₂₂₂ X₂₂₃ X₂₂₄ X₂₂₅ X₂₂₆ X₂₂₇ X₂₂₈ X₂₂₉ X₂₃₀ X₂₃₁ X₂₃₂ X₂₃₃ X₂₃₄ X₂₃₅ X₂₃₆ X₂₃₇ X₂₃₈ X₂₃₉ X₂₄₀ X₂₄₁ X₂₄₂ X₂₄₃ X₂₄₄ X₂₄₅ X₂₄₆ X₂₄₇ X₂₄₈ X₂₄₉ X₂₅₀ X₂₅₁ X₂₅₂ X₂₅₃ X₂₅₄ X₂₅₅ X₂₅₆ X₂₅₇ X₂₅₈ X₂₅₉ X₂₆₀ X₂₆₁ X₂₆₂ X₂₆₃ X₂₆₄ X₂₆₅ X₂₆₆ X₂₆₇ X₂₆₈ X₂₆₉ X₂₇₀ X₂₇₁ X₂₇₂ X₂₇₃ X₂₇₄ X₂₇₅ X₂₇₆ X₂₇₇ X₂₇₈ X₂₇₉ X₂₈₀ X₂₈₁ X₂₈₂ X₂₈₃ X₂₈₄ X₂₈₅ X₂₈₆ X₂₈₇ X₂₈₈ X₂₈₉ X₂₉₀ X₂₉₁ X₂₉₂ X₂₉₃ X₂₉₄ X₂₉₅ X₂₉₆ X₂₉₇ X₂₉₈ X₂₉₉ X₃₀₀ X₃₀₁ X₃₀₂ X₃₀₃ X₃₀₄ X₃₀₅ X₃₀₆ X₃₀₇ X₃₀₈ X₃₀₉ X₃₁₀ X₃₁₁ X₃₁₂ X₃₁₃ X₃₁₄ X₃₁₅ X₃₁₆ X₃₁₇ X₃₁₈ X₃₁₉ X₃₂₀ X₃₂₁ X₃₂₂ X₃₂₃ X₃₂₄ X₃₂₅ X₃₂₆ X₃₂₇ X₃₂₈ X₃₂₉ X₃₃₀ X₃₃₁ X₃₃₂ X₃₃₃ X₃₃₄ X₃₃₅ X₃₃₆ X₃₃₇ X₃₃₈ X₃₃₉ X₃₄₀ X₃₄₁ X₃₄₂ X₃₄₃ X₃₄₄ X₃₄₅ X₃₄₆ X₃₄₇ X₃₄₈ X₃₄₉ X₃₅₀ X₃₅₁ X₃₅₂ X₃₅₃ X₃₅₄ X₃₅₅ X₃₅₆ X₃₅₇ X₃₅₈ X₃₅₉ X₃₆₀ X₃₆₁ X₃₆₂ X₃₆₃ X₃₆₄ X₃₆₅ X₃₆₆ X₃₆₇ X₃₆₈ X₃₆₉ X₃₇₀ X₃₇₁ X₃₇₂ X₃₇₃ X₃₇₄ X₃₇₅ X₃₇₆ X₃₇₇ X₃₇₈ X₃₇₉ X₃₈₀ X₃₈₁ X₃₈₂ X₃₈₃ X₃₈₄ X₃₈₅ X₃₈₆ X₃₈₇ X₃₈₈ X₃₈₉ X₃₉₀ X₃₉₁ X₃₉₂ X₃₉₃ X₃₉₄ X₃₉₅ X₃₉₆ X₃₉₇ X₃₉₈ X₃₉₉ X₄₀₀ X₄₀₁ X₄₀₂ X₄₀₃ X₄₀₄ X₄₀₅ X₄₀₆ X₄₀₇ X₄₀₈ X₄₀₉ X₄₁₀ X₄₁₁ X₄₁₂ X₄₁₃ X₄₁₄ X₄₁₅ X₄₁₆ X₄₁₇ X₄₁₈ X

3.3.1 Output to Output Faithfulness to the Normal form

%Partial metathesis occurs to make the Focus Final Form more similar to the Normal form.

- (19) **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 immediately 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; i.e. the Focus Final form of *sina* [sin̩a] has the same contiguous vowels of the Normal form [sin̩a].

(20)	/kɔ́ 1 2]focus/, Normal [kɔ́ 1 2]		Focus-Stress	OO VVContig	Integrity
	♥ a.	$\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \text{ X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$			
	b.	$\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$!	

3.3.2 Why Partial Metathesis Cannot be Motivated by SWP

Note that a candidate with partial metathesis does better with respect to SWP than the candidate without partial metathesis.

(21)	/kɔ́ 1 2]focus/		SWP	Integrity
	♥ a.	$\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \text{ X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$		

But without OO VVContig, this requires ranking Integrity below SWP, which makes incorrect predictions elsewhere. (22) shows why the ranking Integrity > SWP must hold with forms like *korea* 'to marry'.

(22)	/korea/		Integrity	SWP
	♥ a.	$\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$ $\begin{array}{c} \text{X} \\ \text{X} \\ \text{X} \\ \text{X} \end{array}$		

The same problem occurs even if different constraints are employed other than SWP.

Syllable Economy. Words should have a minimum of syllables (Sohn 1980). Violating Integrity cannot result in fewer syllables.

Unstressed Syllable Economy. Words should have a minimum of unstressed syllables. *darɔ́nɛda* is Normal [kɔ́ 1 2], not *[kɔ́ 1 2] i 'share them'.

4 Conclusion and Summary

There is a third allomorph in the Normal register of Kwará with partial metathesis.

This allomorph is the last word of a focused (i.e. clefted) phrase.

Deletion of the focal 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.

Copying in the Focus Final form cannot occur for the same reason metathesis occurs elsewhere in Kwará; instead, it occurs in order to be faithful to contiguous vowels in Normal form.

A Normal Form Vowel Qualities

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].

(23)

V ₁ V ₂		V ₂				
		i	u	e	o	a
V ₁	i					
	u					
	e					
	o					
	a					
= <i>unattested</i>						
Nuclei following a do occur in fast speech						

The quality of the second element of the diphthong is predictable given V₁ and V₂.

Likewise, given any cell, V₂ is predictable.

B Voiceless Vowels in the Normal form

Blevins and Garrett (1998) give some evidence from Kwarang to support this hypothesis. Transcriptions from Andrew Pawley circa 1982 have some Normal forms as [C₁V₁V₂C₂V₂].

In this data, voiceless vowels occur in the Normal form following any consonant except nasals, as long as V₂ is higher or the same height as V₁, which is the case in (24), but not in (25), which are taken from Blevins and Garrett (1998, p. 530).




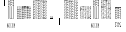













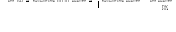
(24)

Citation	Normal	
		eat
		thin
		name

(25)

Citation	Normal	
		teeth
		pain
		pat

I found a different distribution of voiceless vowels. In my data, they occur optionally in the Normal form, primarily word ~~ally~~ after the laryngeals [ʔ] and [ʕ], and somewhat less regularly word ~~ally~~ after the continuants [h] and [ʁ], and nowhere else. Relative vowel height does not matter, cf. ~~tealing~~ and ~~always~~.

(26)	Citation	Normal	
a.			healing
			always
			fear
			fab
b.			wife
			water
			papaya
c.			burst
			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, it's reasonable that her speech pattern reflects another stage of the decline of the *ɔ* vowel.

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