

# Floating Melody and Empty Structure in Rotuman

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The Incomplete paradigm of Rotuman is characterised by complex allomorphy with metathesis, vowel deletion, resyllabification and vocalic alternations/umlaut. I will reanalyse the syllable structure aspects of the non-concatenative Complete/Incomplete morphology using only additive (item-and-arrangement) phonological mechanisms. The shape of representations is crucial. Roots almost all end in floating vowels, while suffixes (subject to a minimality condition) can begin with a wholly empty ‘syllable’. The allomorphy then emerges directly from the root’s underlying shape, as it interacts with the shape of affixes, according to the general phonological computation. The account automatically predicts the shape of root-compounds and that CV:# roots do not alternate. The paper concludes by explaining how the presence of an onset (C<sub>2</sub>) in C<sub>1</sub>V.V# and C<sub>1</sub>V.C<sub>2</sub>V# roots determines the application of segmental changes. The Strict CV representations allow this to emerge naturally from the shape of the roots themselves, without reference to foot structure or syllabic weight.

Keywords: *Root allomorphy, Empty Structure, Floating segments, Metathesis.*

## 1 Introduction

### 1.1 Rotuman and broader architectural concerns

The Rotuman data that will be presented in this paper contains allomorphy both at the level of syllable structure and the segments. Analyses of this pattern speak to issues surrounding the relationship between morpho-syntax and phonology.

As we will see, Hale & Kisser (henceforth H&K) (1998) propose an innovative solution for the syllable structure portion of the alternations. They generate the pattern through the interaction of the language’s regular phonology with the insertion of empty syllable structure.

This ingredient of H&K’s analysis is highly reminiscent of a whole family of phonological solutions that are currently appearing in the literature. This is especially the case in Strict CV. Largely inspired by Scheer (2004, 2012, 2016), there are a number of recent analyses where morphological analyses have been simplified by phonological reanalyses involving vocabulary items that contain empty structure and floating segments (Barillot et al. 2017; Faust et al. 2018; Ulfsbjorninn *to appear*; Newell *under review*; Newell & Ulfsbjorninn *to appear*). However, this is also a key mechanism in some representationally-focused Optimality Theory (OT), such as Zimmermann (2017) and Kiparsky (*to appear*). Across different frameworks, all these approaches use the same representational devices to further the common aim of solving morpho-phonological alternations using only module-appropriate or architecturally-appropriate tools (e.g. *item-and-arrangement* only, inward/outward sensitivity etc...).

To account for the Rotuman alternations, I will develop an analysis in the framework of Strict CV (Lowenstamm 1996; Scheer 2004, 2012). Like Zimmermann (2017), I attempt to analyse

the data using only additive means (despite the subtractive nature of the morphology). However, unlike Zimmermann (2017), I do not employ empty feet.

This analysis is a typical representational solution in that extraordinary phonological processes result from the normal phonology applying over extraordinary underlying forms. The conceptual advantage of representational solutions is that they greatly simplify computation and can lead to analyses that better respect modularity. This analysis locates a large part of the Rotuman-specific linguistic properties in the shape of underlying forms or ‘lexical items’. This is appropriate and consistent with the fact that the ‘lexicon’ is demonstrably the locus of a language’s unpredictable information (cf. ‘Borer conjecture’ (Borer 1981, 1984) (dubbed the ‘Borer-Chomsky conjecture’ by Baker (2008), in the wake of its tentative adoption and development by Chomsky (1995)). This allows highly idiosyncratic morpho-phonological patterns to be generated from phonological computational mechanisms that are general and universal.

The complex vocalic alternations are not dealt with in this paper, instead this study focuses on the syllable structure alternations and the impressive fact that the presence of a medial onset in CVCV# roots seems to be a prerequisite for umlaut and segmental changes, all of which do not occur in CV.V# roots.

## 1.2 Rotuman basics and transcription choices

Rotuman is a Central Pacific Oceanic language, closely related to Fijian. Churchward’s (1940) description of the Rotuman linguistic system is rightly regarded as seminal (Hale & Kissonock 1998; McCarthy 2000; Hale et al. 2012). Since then, others have added to the empirical picture and especially to the interpretation of the patterns that Churchward first described. This includes den Dikken (2003), Vamarasi (2002), Besnier (1987) and Blevins (1994) all of whom worked with native speakers.

As Blevins (1994) warns, there is no instrumental work on the phonetic qualities of the vowels, length or correlates of stress in the language. Therefore, the precise vowel qualities should not be taken as definitive. However, what is well attested from the studies is the sound pattern. In addition to Churchward’s (1940), my study largely bases itself on Besnier’s (1987) and Blevins (1994) description of the phonology of the language. These are relatively modern sources, their attention is focused on phonology and both authors have worked with native informants.

Given that the phonological interpretation of the data is of particular interest here, I should explain that my transcriptions largely follow Besnier’s set of contrasts. However, I have converted his transcription system into IPA. This required changing [y] for ‘ü’ and [j] for ‘y’. I also follow Blevins (1994) in transcribing the *fronted* /a/ as [æ], rather than Besnier’s [e].

One significant departure from both Besnier (1987) and Blevins (1994) is my transcription of the *raised* /a/ as [ɔ] (see 3a). I do not believe that ‘raised /a/’ contains a phonological [+round] feature. I suspect that phonologically, the raised /a/ is just a back/low ‘headed’ low vowel that is phonetically somewhat rounded (or perceived to be rounded); a precise phonological description will be offered in section (4.3). This analysis is similar to Hungarian, which has a short [ɔ] but, for various reasons, the generative tradition (going back to Szépe (1969)) takes it to be underlyingly/phonologically [-round]. The roundness of Hungarian short [ɔ] is assumed to be a

late/post-phonological adjustment rule of some kind (Siptar & Torkenczy 2000, Balogné Bérces p.c.). Emboldened by this, I transcribe Rotuman ‘raised’ /a/ as [ɑ] (though readers should be aware of its potential phonetic rounding).

With these notational choices explained, the vowel inventory and regular vocalic allophones of Rotuman are listed below. This is to avoid confusion given the many vowel changes between the URs and the surface forms (both of which are presented in the derivations).

(1) Vowel Phonemes of Rotuman (Blevins 1994)

i	u
ε	ɔ
a	

(2) Allophonic rules (cf. Besnier 1987; Blevins 1994:492)

a. Raising

/ε/	-->	[e]	/	— C <sub>0</sub> i, u
/ɔ/	-->	[o]	/	— C <sub>0</sub> i, u
/a/	-->	[ɑ]	/	— C <sub>0</sub> i, u

b. Fronting

/á/	-->	[æ]	/	— C <sub>0</sub> e
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i.	p[æ]re	‘protect’	&	f[æ]repóto	‘ferry-port’
ii.	*p[æ]pètaíso	‘baptise’	&	*sùm[æ]léi	‘fish.sp’

## 2 The Complete and Incomplete paradigms

According to a complex and imperfectly formalised set of morpho-syntactic conditions,<sup>1</sup> most of the roots of the language occur in one of two forms referred to as the Complete/Incomplete phase (Churchward 1940).<sup>2</sup> This phenomenon has been intensely studied in Generative/Autosegmental Phonology (Cairns 1976, 2007; Besnier 1987; Odden 1988). Additionally, McCarthy (2000) and Zimmermann (2017) have produced Optimality Theory (OT) analyses of the pattern.

The Complete and Incomplete forms are characterised by a complex set of non-concatenative morpho-phonological alternations. The Incomplete forms are particularly disparate in shape, however, according to standard descriptions, all the forms contain a right-aligned bimoraic syllable/foot. It is assumed that the final heavy syllables of the Incomplete form are derived from underlying CVCV’s via a highly disparate set of processes including: vowel deletion (3a), resyllabification (3b), metathesis (3c) and umlaut (3d). Finally, roots with final long vowels and some loanwords do not alternate (3e).

<sup>1</sup> See Hale & Kissonock (1998) and Vamarasi (2002), as well as den Dikken (2003) and Hale & Kissonock (2009).

<sup>2</sup> I will call these ‘forms’ (or simply the Complete/Incomplete) rather than ‘phases’, to avoid confusion with the phases of phase theory (Chomsky 1999; 2001).

(3)	Complete	Incomplete	Process	
a.	fe.su	fes	<i>Deletion</i>	‘tie’
b.	fe.u	few	<i>Resyllabification</i>	‘tail’
c.	hɔ.sa	hwas	<i>Metathesis</i>	‘flower’
d.	ha.ʔi	hæʔ	<i>Umlaut</i>	‘pull’
	fu.ti	fyt		‘banana’
	ro.si	røʂ		‘deceive’
e.	si.ka:	--	<i>No change</i>	‘cigar’

As for its distribution, the Complete and Incomplete ‘paradigms’ are forms that roots take in a certain set of varied morpho-syntactic contexts (Churchward 1940). These appear to be triggered by specific affixes (H&K; McCarthy 2000), for more on this and for some debate: den Dikken 2003; Varanasi 2005; Hale & Kissock 2009). Some of the distribution of strong and weak forms is shown in (4) and (5) beneath.

(4) Complete

a.	Definite plural			
	[vaka]		‘the canoes’	(H&K)
	[iʔa]		‘fish’	(Besnier 1987:204)
b.	Before monosyllabic suffixes			
	[rofi.a]	/rofi + a/	‘lose one’s head’	(H&K)

(5) Incomplete

a.	Indefinite plural			
	[vak]		‘canoes’	(H&K)
	[iɑʔ]		‘fish’	(Besnier 1987:204)
b.	Before disyllabic affixes (or larger)			
	[al.ti.a]	/ala + ti.a/	‘to have died’	
c.	Compounds			
	[aŋvao]	/aŋa + vao/	‘stretch arms’	(Blevins 1994)
d.	Phrases			
	([iɑʔ] (ne ŋou pō ʔe [asa]))			(Besnier 1987:204)
	Inc.	Comp.		
	‘the <b>fish</b> I caught <b>yesterday</b> ’			
	([iɑʔ] (ne ŋou pō ʔe [as]))			(Besnier 1987:204)
	Inc.	Inc.		
	‘some <b>fish</b> I caught <b>yesterday</b> ’			

The forms of the Incomplete look highly varied in shape. For roots that end in CVCV#, the full set of alternations is shown in (6) beneath.<sup>3</sup>

(6) Vocalic Alternations between the Complete and Incomplete for CV final words

	<b>i</b>	<b>ɛ</b>	<b>a</b>	<b>ɔ</b>	<b>u</b>
<b>i</b>	riʔi > riʔ 'small'	tife > tjaf 'pearl shell'	hiʔa > hjaf <sup>4</sup> 'lie over'	rito <sup>5</sup> > rjot 'glitter'	tiʔu > tiʔ 'big'
<b>ɛ</b>	fesi > fes 'tree.sp'	hɛʔɛ > hɛʔ 'octopus'	tɛka > tjak 'take'	hɛʔɔ > hɛʔ 'hello'	fesu > fes 'tie'
<b>a</b>	hɑʔi > hæʔ 'pull'	vævɛ > væv 'fast'	ʔasa > ʔas 'day'	faʔɔ > faʔ 'nail'	faʔu > faʔ 'back'
<b>ɔ</b>	rosi > rɔs 'deceive'	kɔfɛ > kɔf 'coffee'	hɔsa > hwas 'flower'	sɔrɔ > sɔr 'grate'	loʔu > loʔ 'fold'
<b>u</b>	futi > fyt 'banana'	huŋɛ > hwaŋ 'breathe'	puka > pwak 'creeper.sp'	ulɔ > wol 'seabird.sp'	ʔulu > ʔul 'breadfruit'

Another main type of root undergoes a different set of changes. These roots are characterised by a vowel-vowel hiatus sequence (CV.V#). Churchward (1940) notes that when the first vowel in these hiatus sequences is more sonorous, the Incomplete form is marked by a shortening of the first vowel (V<sub>1</sub>) and the stress changes from being wholly distributed on V<sub>1</sub> to spanning across V<sub>1</sub> and V<sub>2</sub>. Cairns (2007) further shows that the second vowel (V<sub>2</sub>) becomes offglided.<sup>6</sup>

(7) V<sub>1</sub>V<sub>2</sub> with V<sub>1</sub> more sonorous than V<sub>2</sub> or equivalent (transcription based on Cairns 2007)

	<b>Complete</b>	<b>Incomplete</b>	
a.	[lé.o]	[lɛw]	'person'
b.	[má.o]	[mɔw]	'lost'
c.	[væ.e]	[vɛj]	'divide'
d.	[mó.e]	[mɔj]	'brown'

<sup>3</sup> The data in the table follows Besnier (1987) closely. As I discuss in the lead up to (2), I have changed the derived /a/ that Besnier gives as [ɔ] to [ɑ]. Where appropriate, I have also converted his underlying mid vowels into open-mid vowels (Blevins 1994). Elsewhere, I have changed the forms to conform to the rule of mid-vowel raising before either /i, u/ (Blevins 1994). I believe this is the best approximation of the Rotuman vowel pattern, based on all the sources. Besnier (1987:212) had included the open/close-mid qualities, but only for 'light diphthong' Incomplete forms.

<sup>4</sup> This form is actually given as [hiɔf] in Besnier (1987:212), however, I take it to be equivalent to be [hjɔf]. Nothing else in Besnier indicates that this form should have a different syllabification to the other forms in the paradigm.

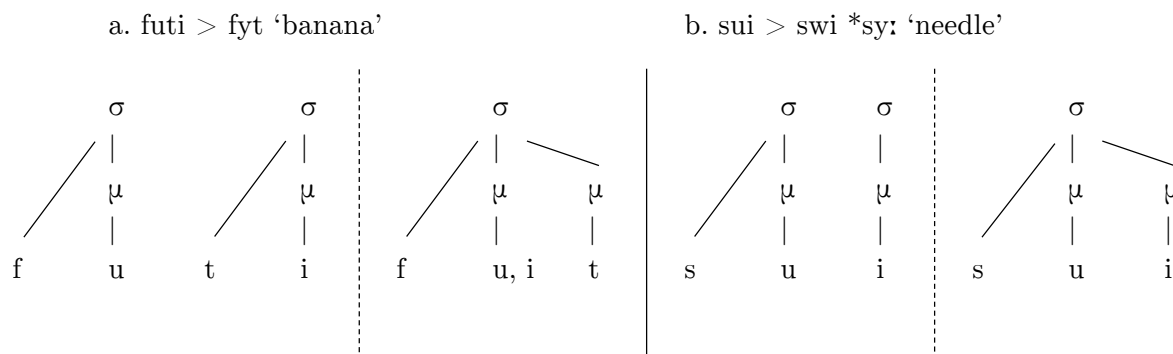
<sup>5</sup> The open-mid, close-mid status of the final unstressed mid-vowels is unknown to me. I mark them as Besnier has them (1987).

<sup>6</sup> Cairns (2007) shows that even mid-vowels simplify to glides. This is consistent with my analysis (section 4.1). Cairns also shows that what look like light-diphthong sequences (with sonority and stress on the second member of the VV) seem to also form from CV.V roots: /mo.e.a/ > [mo.yá] 'crop' & /ʔa.ta.ko.a/ > [ʔà.ta.kwá] 'whole' (cf. /ma.ma.e/ > [ma.mæj] 'to mourn'). This is intriguing, and at odds with McCarthy's (2000) analysis, further investigation is needed.

McCarthy’s (2000) analysis of the final VV# roots (adopted also by Zimmermann (2017)) is that they become heavy diphthongs. In his analysis, the Incomplete form aims to form a right-aligned heavy-syllable. Where possible, CVCV’s will be metathesized to form CVVC’s, however, the resulting syllable must be maximally bimoraic. Therefore, the VV outputs derived from CVCV roots must be light diphthongs. Conversely, CV.V words become CVV syllables. According to McCarthy’s (2000) analysis, these must be heavy diphthongs in order to satisfy the language’s bimoraic foot constraints (Blevins 1994).

One big achievement of McCarthy’s (2000) analysis is that it neatly explains why some forms undergo coalescence and others do not. In this analysis, VCV# roots become VVC# and, as such, are limited to light diphthongs only. Fittingly, these all increase in sonority (Kaye 1983; Kaye & Lowenstamm 1984; Rosenthal 1994). VV# final roots, however, must (by hypothesis) create heavy diphthongs. As such, the umlaut triggering /i/ and /e/ do not share a mora with the potential targets of umlaut.

(8) Coalescence in McCarthy (2000)



However, McCarthy’s analysis in (8) means that his heavy diphthongs are phonotactically unconstrained, including sequences of rising sonority: /fia/ > [fja] ‘pouch of a sling’.<sup>7</sup> Moreover, there is no language-internal evidence for this split between light and heavy diphthongs, only conjecture based on general markedness (McCarthy 2000).

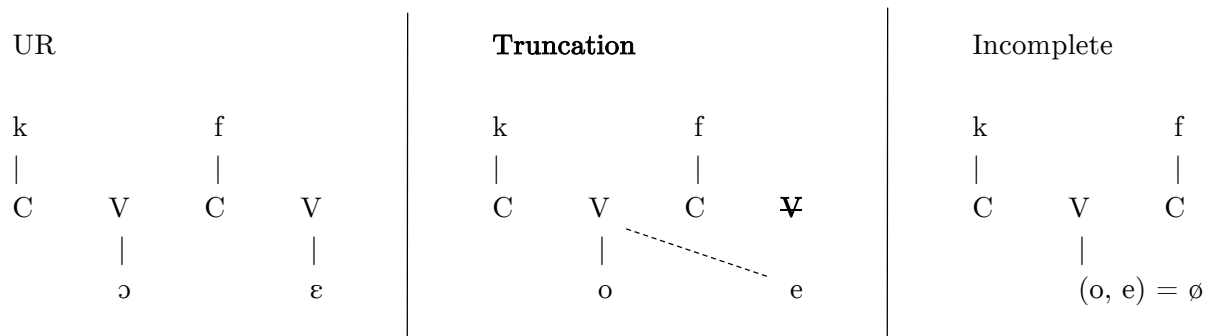
## 2.1 Aims of the analysis compared to previous approaches

In the short space available, it is impossible to provide a fully representative discussion of how my analysis supports, denies or interacts with the previous analyses. My main goal, therefore, will be to present the goals of my analysis and explain in what basic ways these differ from previous approaches. Any relevant or specific differences will be highlighted throughout the text.

<sup>7</sup> McCarthy (2000) transcribes this as ‘fia’. Besnier’s transcription of these i+V sequences is (usually) with a glide: [fja]. This strikes me as more phonetically likely and seems to match better with Churchward’s (1940:86) description that states that the first part of these VV sequences is shortened and the stress being distributed across both parts of the sequence.

My analysis is based in Strict CV. Specifically, I aim to analyse the whole of the Incomplete/Complete paradigm using only ‘additive’ means (cf. Zimmermann 2017). I exclude the use of procedural operations that would otherwise seem tempting, such as: ‘empty the final syllable/V<sub>2</sub>’ or propose a morphologically-specific truncation (Besnier 1987) (shown in (9) beneath). I will also avoid the teleology inherent to McCarthy’s (2000) OT’s analysis (Incomplete ends in heavy syllable).

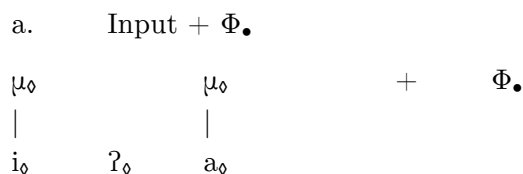
(9) Process-driven derivation for Incomplete /kɔfɛ/ > [kɔf] ‘coffee’ (Besnier 1987:214-215)



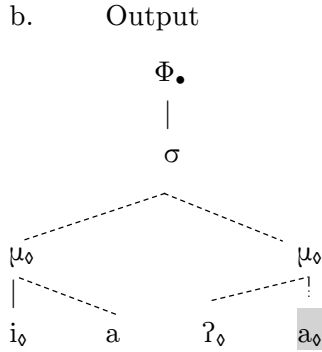
My account is also careful to respect strict modularity. In this analysis, the morpho-syntax and the phonology will only have access to information that is native to that module. Moreover, I will try to derive the templatic nature of the effect (as much as possible) from the spell-out and vocabulary insertion steps of a Distributed Morphology architecture (Halle & Marantz 1993). This way, I will avoid simply stipulating a template for the Complete paradigm and another template for the Incomplete.

Because I am proposing a Strict CV representational analysis, my analysis cannot insert empty feet as Zimmermann (2017) does. Though I *do* maintain that Strict CV phonology has a ‘grouping’ mechanism (Ulfsbjorninn 2014) and something akin to true quantity (ibid; Faust & Torres-Tamarit 2017; Faust & Ulfsbjorninn 2018)), weight and rhythmic ‘grouping’ still operate via lateral relations, not constituents. This is crucial because *relations* cannot be added by vocabulary insertion. Therefore, because there is no such thing as a foot *constituent* in Strict CV, my account cannot insert an empty/defective foot and I therefore cannot adopt or support Zimmermann’s (2017) analysis (shown in (10)).

(10) Integration of an empty foot in Zimmermann’s PDM framework of OT (2017:233)<sup>8</sup>



<sup>8</sup> The OT tableau and the specific constraints and mechanisms by which the whole analysis operates are not shown here. The details of the analysis need not detain us, but as we see in (10a) there is a segmentally empty foot. This is added to the structure and ultimately leads to the stray erasure of a segment (greyshaded) (10b).



This analysis, is like McCarthy’s (2000) in that it effectively treats the structural description of the Incomplete (with its final consonants, diphthongs and non-structure preserving segmental changes) as a language-internal exceptional pattern. It is presented as if the Incomplete forms somehow violate the ‘general’ rules of the language (McCarthy 2000; Zimmermann 2017). McCarthy (2000) even claims this ‘incoherence’ as a vindication of Optimality Theory, because it demonstrates how constraints can be both active and dominated. However, in the Strict CV analysis, this ‘incoherence’ proves to be wholly unnecessary. In the Strict CV analysis, the skeletal level of the Complete and Incomplete are identical. Furthermore, in a Strict CV representation, all the forms are generated from the same stress pattern. Also, the Strict CV analysis does *not* require a special syllable structure for the Incomplete paradigm (McCarthy 2000), or the special affixation of an empty foot (Zimmermann 2017). This makes the Strict CV analysis somewhat simpler than previous approaches.

Interestingly, H&K also produce a ‘coherent’ analysis by: (a) building binary feet, (b) assigning stress and (c) deleting unstressed vowels at the edge of feet. The Strict CV analysis is simpler than this proposal, however, because it does not require a process of syllable structure/mora deletion (of the right-edge foot dependent). It is also unclear (to me at least) how in H&K’s analysis the long vowels in non-bi-moraic roots escape being shortened.<sup>9</sup>

Beyond the CVCV minimality condition of roots and affixes, the shape of roots is lexical and not assumed to be derived by a morpheme structure constraint. Neither is there an appeal to Richness of the Base. Roots that do not conform to a certain phonological shape, such as some recent loans, simply do not alternate (cf. Blevins 1994). And, original to my analysis (unlike H&K), the reason for their non-alternation is identical as for the native roots with final long vowels. All these roots form a representational natural class in that they (unlike almost all other native roots) do not end in floating vowels.

Having established the aims of my analysis and explained in broad strokes how these aims contrast with the outcomes of the main previous analyses, I will turn to presenting the details of my analysis.

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<sup>9</sup> Of course, CVV roots may not be shortened due to the minimal word effect (Blevins 1994), but non-alternation of polysyllabic words with final long vowels cannot be explained in this way: [sika:] ‘cigar’.



### 3 The Strict CV Analysis

#### 3.1 Shape of Roots

The key alternation in the Complete and Incomplete involves the apparent morphologically-triggered deletion of phonological material. In an *Item-and-Arrangement* type morpho-phonology (Hockett 1954; cf. Bonet 2008) (that I believe Strict CV should be committed to), all morphology ought to be additive. Zimmermann (2017) very creatively tries to find a way to achieve the morpho-phonological ‘magic trick’ of getting subtraction by addition. In my related approach the same effect is achieved by using floatingness and emptiness.

In Strict CV vocabulary items can come in the following configurations.

(11) Shapes of exponents (Bendjaballah & Haiden 2008; Faust et al. 2018)

a.	Fixed Skeleton & Melody	b.	Floating Melody	c.	Empty Skeleton	d.	Unfixed Skeleton & Melody
	C    V				C    V		C    V
	α    β		α				α    β

These may appear to be a very permissive set of representations with their floating features (11b), empty structure (11c), or both (11d). However, all of the configurations in (11) follow automatically from autosegmental first principles.

In the autosegmental schema, representations are made up of (at least) two tiers. One tier makes up the syllable structure positions (the skeleton), and another layer contains all the sub-skeletal features (the melodic/segmental tier) (Goldsmith 1976). These two tiers are linked by association lines (Leben 1973).

Given no further stipulations, free combination automatically generates the combinations in (11). In fact, in order to exclude any one of the configurations in (11), one would actually require a *more* complex phonological system. This is because it would still have to contain those two layers of representation but, in addition, it would have to contain further conditions banning some of the configurations in (11). Moreover, as Zimmermann (2017) states from her own perspective, there would be no reason to eliminate this battery of linguistic structures if they can be shown to be advantageous in linguistic analysis.

Assuming the structures in (11), roots are lexically specified to contain floating segments. So roots and affixes are defined not just by their segmental content, but also their skeletal slot content *and* their association line content.

Within their own morphemes, floating segments do not have ‘sufficient space’ or the skeletal position they require in order to be expressed. On the linguistic surface, this will lead to an effect where certain segments in words are fixed, while others pop up depending on their

phonological surroundings. This contingency of phonetic expression can lead to segment-zero alternations (without the use of selectional allomorphy) (a sample derivation is shown in 12).

Also, since the exponents of morphemes may be made up entirely of floating segments, or segmentally-empty syllable structure, these alternations can be made to look like paradigm/morpheme specific phonological processes, despite it being a purely phonological consequence of inserted morphemes. This can happen if a root ends in a final floating segment and the exponent of a morpheme is a wholly empty piece of skeletal structure. Under these conditions, segments will alternate with zero in certain morpho-syntactic contexts (depending on the specific phonological shape of the vocabulary items).

(12) Floating melody meets empty structure (cf. Fathi & Lowenstamm 2016)<sup>10</sup>

a. UR of  $\sqrt{\text{pti}}\langle t \rangle$  [peti] ‘small’

C	<u>V</u>	C	V	
p		t	i	t

b.  $\sqrt{\text{pti}}\langle t \rangle$  + CV (fem) [petit] ‘small (fem)’

C	<u>V</u>	C	V	+	C	V
p		t	i	t	t	i

c.  $\sqrt{\text{peti}}\langle t \rangle$  + vowel initial word = [petitami] ‘small friend (masc)’

C	<u>V</u>	C	V	+	C	V	C	V
p		t	i	t	a	m	i	

Turning to Rotuman, H&K have an analysis based on inserting a piece of empty structure. In H&K, if D bears certain morpho-syntactic features, D will be exponed by  $/-\emptyset_{\mu}/$ , a floating mora. I follow this analysis, but assume that representationally the exponent is an Empty CV. H&K’s analysis then uses foot-structure to explain word-final vowel deletion in the Incomplete forms.<sup>11</sup>

<sup>10</sup> Governed positions are shown underlined governed empty nuclei are ‘silenced’ (see (15)).

<sup>11</sup> It is not obvious to me how the forms obtain the correct footing and stress pattern, or if the vowels at the right edge of feet delete word-internally: [(fære)(poto)] ‘ferryboat’ (Blevins 1994), or if the footing proposed in H&K is consistent with what can be known from the foot-sensitive rule of vowel raising and other foot conditions mentioned

(13) H&K /-Ø<sub>μ</sub>/ analysis

a.	/vaka/	(va <sub>μ</sub> ka <sub>μ</sub> )	vak	‘canoes (indef.pl)’
b.	/vaka + <sub>μ</sub> /	<va <sub>μ</sub> >(ka <sub>μ</sub> <sub>μ</sub> )	vaka	‘the canoes (def.pl)’
c.	/vaka fisi/	(va <sub>μ</sub> ka <sub>μ</sub> )(fi <sub>μ</sub> si <sub>μ</sub> )	vakfis	‘white canoes’
d.	/vaka fisi + <sub>μ</sub> /	(va <sub>μ</sub> ka <sub>μ</sub> )<fi <sub>μ</sub> >(si <sub>μ</sub> <sub>μ</sub> )	vakfisi	‘the white canoes’

I assume that the UR of most roots of Rotuman end in a floating vowel. This is shown in (14) under V<sub>2</sub>.

(14)	C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>
	v	a	k	a

I will now explain how this underlying form automatically generates the syllable structure alternations of the Complete and Incomplete. The phonological computation follows basic Strict CV principles that are introduced for the unfamiliar reader here.

### 3.2 Basics of Strict CV, empty structure and floating segments

Strict CV representations are composed of strictly alternating C and V slots. This leads to a proliferation of empty positions.

The structure shown in (14) contains V<sub>2</sub>, a skeletal slot that is not linked to any segment. Beneath it, there is a floating vowel /a/. Because in Strict CV tiers are independent from each other, as far as V<sub>2</sub> is concerned, it is an empty category. Because it is final in the domain, it is referred to as a FEN (Final Empty Nucleus).

In this framework, empty positions *can* receive a phonetic interpretation (‘epenthesis’). However, under certain universal and parametrized conditions empty positions are silenced (=marked as not receiving any phonetic interpretation).

(15) Silencing of empty positions

a. Domain-Final Parameter (DFP) (based on Kaye 1990)

*Domain-final empty V slots are silenced (receive no phonetic interpretation)*

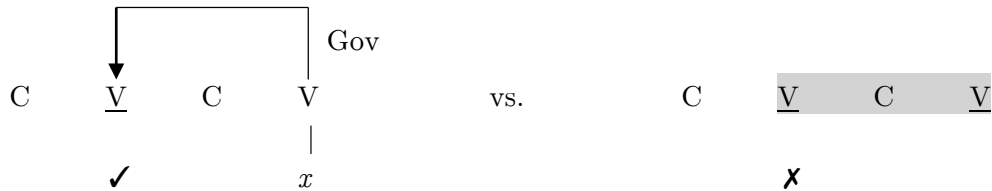
C	V	C	<u>V</u>
x	y	z	

---

in Blevins (1994). It is also not clear to me why final long vowels are not shortened by this same process that seems to unlink the vowel linked to foot dependent moras: \*[sika] for [sika:] ‘cigar’.

- b. Gov(ernment) (based on Charette 1991)

An empty V-slot can be silenced by Gov *iff* it is followed by a V-slot that is **not** itself silenced.



Floating segments are happy to link to empty positions, however, floating segments do not link to silenced positions; including FEN in languages where the DFP is set to <yes> or to Gov'd positions (Pagliano 2003; Barillot et al. 2017; Faust et al. 2018).

The consequences of this computation for Rotuman are as follows. As shown in (15), a language's ability to leave domain-final empty nuclei unpronounced is parameterised. In Yoruba, for instance, the DFP is set to <no> and all words must end in vowels. Conversely, in English the setting is <yes> and resultantly it allows consonant-final words.

In Rotuman, the Incomplete forms show us that the DFP must be set to <yes>, as word-final consonants are clearly permitted in the language.

### 3.3 Segment 'deletion' in the Complete and Incomplete

The fact that FEN are silenced by the DFP has implications for the phonetic expression of the floating vowels. This is because floating vowels cannot link to silenced positions. In (16) we see that  $V_2$  has been silenced by the DFP (shown as underlined ( $V_2$ )) and, consequently, the final floating vowel is stray erased (grey shaded).

This computation shows the non-teleological strength of Strict CV.  $V_2$  sits on top of a floating vowel but this does not mean that the floating segment will simply link to it. The tiers are independent.<sup>12</sup> When the form is computed, the phonology treats  $V_2$  exactly for what it is: a FEN (a final V with no segment attached) and in Rotuman, FEN are silenced by the DFP by parameter.

(16)	C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	<u>V<sub>2</sub></u>	Phonetic output
				a	
	v	a	k	a	[vak] 'canoes'

<sup>12</sup> What's obvious to an intelligent observer looking at a diagram on paper is not obvious to the phonology.

As the great majority of roots end in final empty V-slots, and the language has the DFP set to <yes>, *all things being equal*, roots will be consonant final (16). This generates the consonant-final forms of the Incomplete.

If, however, the root is suffixed with morpheme containing an empty nucleus, such as the Empty CV of the definite plural (equivalent to H&K's /-Ø<sub>u</sub>/), then V<sub>2</sub> will no longer be final in the domain. Consequently, V<sub>2</sub> will not be silenced by the DFP.

(17) ‘canoe’ in the complete form ‘the canoes’

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	+	C <sub>3</sub>	V <sub>3</sub>
			a			
v	a	k				

The representation in (17) shows that by introducing CV<sub>3</sub> (exponing D), the morpho-syntax has put together two consecutive empty Vs. In (17), V<sub>2</sub> is no longer domain-final, as such, it cannot be silenced by the DFP. As V<sub>2</sub> is an empty category, it could still be phonetically unexpressed if it were Gov'd by a filled V to its right. However, to the right of V<sub>2</sub> is V<sub>3</sub>, and V<sub>3</sub> is a FEN. Therefore, V<sub>3</sub> cannot Gov V<sub>2</sub>. According to the definition of Gov in (15b) (which is completely general to Strict CV) the structure in (17) would incur a phonological ECP violation (grey shaded). All this means that V<sub>2</sub> is an empty and non-silenced skeletal position. Therefore, it is available for docking by the floating vowel.

The structures in (18) show the derivation of the Complete, triggered by phonological conditions purely in response to the shape of the vocabulary items.

(18) Floating vowel surfacing in the complete forms

a. Underlying forms √vaka ‘canoe’ + definite plural

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	+	C	V
			a			
v	a	k				

b.

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C	V
			a		
v	a	k			

c.

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C	V
			⋮		
v	a	k	a		[vaka] ‘the canoes’

The Empty CV, which in this case is the exponent for the definite plural, ensures the linking of the floating vowel. Because the empty CV is silenced by the DFP it will receive no phonetic interpretation.

### 3.4 Consequences for root-compounds

Interestingly, this phonological explanation for the Complete and Incomplete automatically explains why in root-compounding the root on the left always appears in the Incomplete, while the root on the right can appear in the Incomplete or Complete (depending on the features in D).

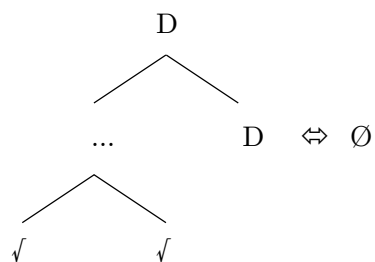
Compounds in Rotuman are at the root level (consistent with the fact that they can be made up of roots of any category (Blevins 1994:499)).

(19) Compounds of Rotuman (Blevins 1994 e.g. a-b; Besnier 1987:211 e.g. c).

a.	fajkele	‘kind of creeper’	faja	‘whicker fish trap’
			kele	‘black’
b.	mafuhu	‘minutely’	mafa	‘eyes’
			huhu	‘take off’
c.	sægvævæni	‘classificatory brother’	sagi	‘no gloss’
			vavani	‘no gloss’

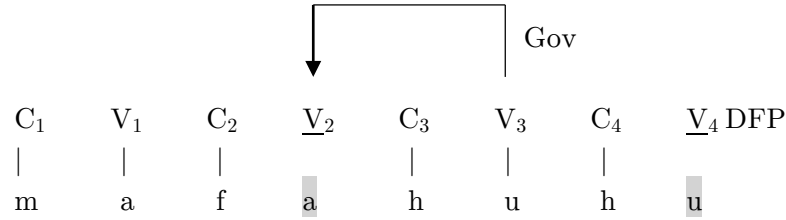
Expectedly, Gov applies across the two roots of the compound (henceforth: R<sub>1</sub> & R<sub>2</sub>). This ensures that the R<sub>1</sub> of root-compounds always surfaces as the Incomplete form. By hypothesis, almost all roots in Rotuman end in floating vowels. And it is transparently the case that all roots begin with a filled CV/ ‘open’ syllable (shown in 20, 21 and 22). Therefore, in root compounds, the final V of R<sub>1</sub> will always be Gov’d (shown in 20b, 21b and 22c). Consequently, the V<sub>2</sub> of R<sub>1</sub> will always be silenced, ensuring that the floating vowel of R<sub>1</sub> will not link to V<sub>2</sub>.

(20) R<sub>1</sub> will be in the Incomplete in all root-compounds



a.	/mafafa/ ‘eyes’					/huhu/ ‘take off’			
	C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	+	C <sub>3</sub>	V <sub>3</sub>	C <sub>4</sub>	V <sub>4</sub>
	m	a	f	a		h	u	h	u

b. /mafa + huhu/ > [mafuh] ‘minutely’



Meanwhile, the R<sub>2</sub> of the root-compound can appear in either the Incomplete or Complete form depending on what follows it.

If no other vocabulary item is inserted, R<sub>2</sub> will be final in the domain and its final V position (V<sub>4</sub> in 20b and 21b) will be silenced by the DFP. If this happens, the final floating vowel of R<sub>2</sub> will not be able to link to V<sub>4</sub> and R<sub>2</sub> will show up in the Incomplete form (20b, 21b).

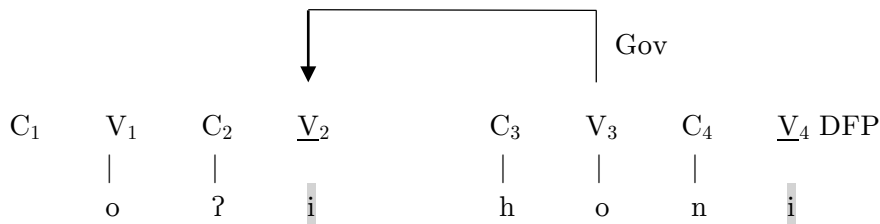
(21) R<sub>1</sub>-R<sub>2</sub> with R<sub>2</sub> in the Incomplete (Besnier 1987:211)

a. UR /oʔi/ + /honi/ > oʔhon ‘classificatory mother (Incomplete)’



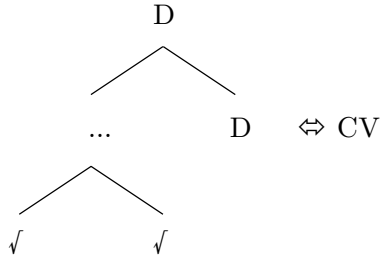
b. V<sub>2</sub> of R<sub>1</sub> is silenced by Gov, /i/ is stray erased

V<sub>4</sub> of R<sub>2</sub> is silenced by DFP, /i/ is stray erased



If, however, the R<sub>2</sub> of root-compounds is followed by an empty CV (the exponent of certain syntactic D heads). Then, as we see in (22a), V<sub>4</sub> is not silenced by the DFP. Also it cannot be Gov'd (because V<sub>5</sub> will be silenced by the DFP). As such, V<sub>4</sub> is an empty ungoverned position and it acts as a docking site for R<sub>2</sub>'s final floating vowel (22b). The result is R<sub>2</sub> appearing in the Complete form (22c).

(22) R<sub>1</sub>-R<sub>2</sub> with R<sub>2</sub> in the Complete form

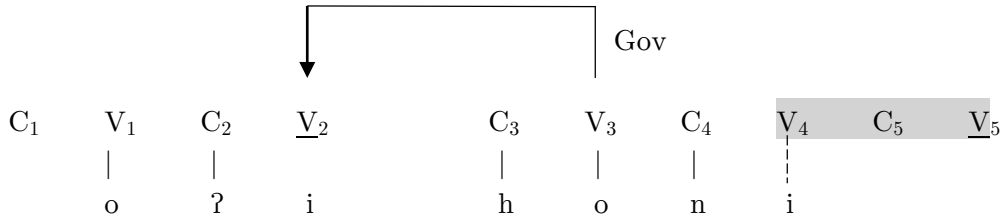


a. UR /oʔi/ + /honi/ + /CV/ > oʔhoni ‘classificatory mother (Complete)’

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	+	C <sub>3</sub>	V <sub>3</sub>	C <sub>4</sub>	V <sub>4</sub>	+	C <sub>5</sub>	V <sub>5</sub>
	o	ʔ	i		h	o	n	i			

b. V<sub>1</sub> is silenced by Gov so /i/ is stray erased

V<sub>4</sub> of R<sub>2</sub> links to its /i/



c. V<sub>4</sub> is linked to /i/

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	<u>V<sub>2</sub></u>		C <sub>3</sub>	V <sub>3</sub>	C <sub>4</sub>	V <sub>4</sub>	C <sub>5</sub>	<u>V<sub>5</sub></u>
	o	ʔ	<b>i</b>		h	o	n	i		

### 3.5 Shape of disyllabic affixes

H&K observe that the affixes that pattern with the Complete and Incomplete are largely predictable from their phonological shape. They incorporate this into their explanation of the pattern and McCarthy (2000) builds on that also. In the Strict CV analysis, the Complete and Incomplete affixes are also phonologically predictable but their structural description is different to that proposed in H&K.<sup>13</sup>

<sup>13</sup> Rotuman affixes also involves stress shift, but describing the prosodic system would constitute a tangent.



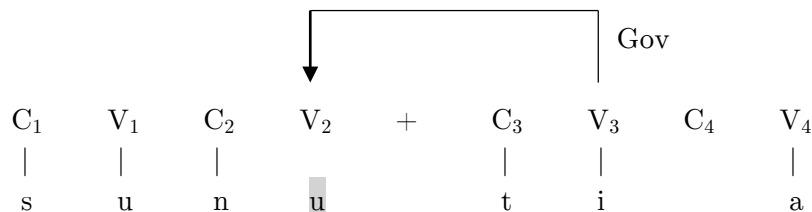
## (23) Affix shape

- a. ‘empty affix’ (certain D heads, producing the Complete form)
- |    |      |                      |       |             |
|----|------|----------------------|-------|-------------|
| i. | vaka | $-\varnothing_{\mu}$ | va.ka | ‘the ships’ |
|----|------|----------------------|-------|-------------|
- b. ‘monomoraic’ go with the Complete root
- |     |           |             |          |                   |
|-----|-----------|-------------|----------|-------------------|
| i.  | puʔa      | -ŋa         | pu.ʔa.ŋa | ‘greed’           |
|     | be greedy | NOMINALISER |          |                   |
| ii. | rofi      | -a          | rofi.a   | ‘lose one’s head’ |
|     | lose head | COMPLETIVE  |          |                   |
- c. ‘bimoraic’ go with the Incomplete root
- |     |           |              |          |                 |
|-----|-----------|--------------|----------|-----------------|
| i.  | sunu      | -ʔi.a        | sun.ʔi.a | ‘to become hot’ |
|     | to be hot | INGR(ESSIVE) |          |                 |
| ii. | ala       | -ti.a        | al.ti.a  | ‘to have died’  |
|     | to die    | COMPLETE     |          |                 |

The empty affixes, such as the definite plural, pattern with the monosyllabic affixes. This derivation has already been shown in (18). The affixes that come with the Complete forms all tend to be monosyllabic, while the disyllabic affixes all take the Incomplete form, just like the root-compounds. I take this to mean that all affixes (barring the completely empty ones) are made up of two CV units. Therefore, the only difference between the two affix classes is that the surface-disyllabic suffixes are melodically full: both their CVs are linked to melodic material.<sup>14</sup> This means that disyllabic affixes, like all roots, begin with a filled CV. As I show in (24b), the affix’ CV<sub>3</sub> can govern the CV<sub>2</sub> of a preceding root, in a manner identical to what happens with root-compounds.

## (24) Disyllabic affix

- a. UR /sunu + ti.a/ hot + INGR<sup>15</sup>
- |                |                |                |                |   |                |                |                |                |
|----------------|----------------|----------------|----------------|---|----------------|----------------|----------------|----------------|
| C <sub>1</sub> | V <sub>1</sub> | C <sub>2</sub> | V <sub>2</sub> | + | C <sub>3</sub> | V <sub>3</sub> | C <sub>4</sub> | V <sub>4</sub> |
|                |                |                |                |   |                |                |                |                |
| s              | u              | n              | u              |   | t              | i              | n              | a              |
- b. [sunti.a] ‘to become hot’



<sup>14</sup> I will continue to refer to monosyllabic and disyllabic affixes for ease of exposition.

<sup>15</sup> Notice, the segmental material of the affixes is lexically linked to the skeletal positions.

The floating final vowel (beneath V<sub>2</sub>) is governed by V<sub>3</sub> (and therefore stray erased). This leads to the root appearing in the Incomplete form.

According to this hypothesis, monosyllabic affixes all begin with an empty initial CV. Although there is no direct evidence for this hypothesis, it has the satisfying consequence that *all* roots and affixes in Rotuman are minimally CVCV (except those that are completely melodically empty).<sup>16</sup> Curiously, Rotuman affixes that lexically only have the material to fill one CV fill the second CV, leaving the leftmost CV lexically empty.<sup>17</sup> This is shown in (25) along with its implications for the floating vowels at the end of roots.

(25) Monosyllabic affixes (such as the Nominaliser /-ŋa/)

a.	C	V	C	V
			ŋ	a

(26) Derivation of root + monosyllabic affix

a. UR /puʔa + ŋa/ ‘greed + NOMLZ’

C	V	C	V	+	C	V	C	V
p	u	ʔ	a				ŋ	a

b. V<sub>3</sub> is Gov by V<sub>4</sub>, V<sub>2</sub> has no source of Gov so must link to the floating /a/

C	V	C	V	+	C	V	C	V
p	u	ʔ	a				ŋ	a

c. [puʔaŋa] ‘greed’

C	V	C	V	+	C	V	C	V
p	u	ʔ	a				ŋ	a

<sup>16</sup> This minimality condition holds for roots in Mandarin, but the second CV can be lexically empty (Goh 1997). This step in the analysis does not work with Richness of the Base, but this concept has no place in Strict CV.

<sup>17</sup> Interestingly, this appears to be the case for Yine also, another language with subtractive-type morphology.

### 3.6 Shape of long vowels and non-alternating roots

These alternations between Complete and Incomplete do not occur with roots ending in long vowels. According to Blevins (1994:498), long vowels are derived from lexically marked stress. In Strict CV, this lexically marked stress is in the form of an underlying empty CV (Larsen 1998; Scheer 2004; Bucci 2013, Ulfsbjorninn 2014). Therefore, I effectively take long vowels to be lexical in Rotuman.<sup>18</sup>

The important point for our purposes is that the structural description of long vowels necessarily has a segment linked to two Vs. Therefore *by definition* underlying long vowels cannot float. As long vowels are lexically fixed (shown in (27)), their attachment to the skeleton is not contingent on their phonological surroundings; therefore, they will not become stray erased in final position or in positions where they do not receive Government. In both the Complete and the Incomplete they will surface as long vowels.

#### (27) Long vowel and lack of alternation

a. /siká/ [sika:] ‘cigar’

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C <sub>3</sub>	V <sub>3</sub>
					/
s	i	k	a		

Similarly, some lexical items could exceptionally not alternate. Churchward (1940) records at least two non-alternating forms that end with a final short vowel: *tʃísle* ‘chisle’ and *kiánre* ‘candle’.<sup>19</sup>

The Strict CV solution is simply that their final vowel is lexically linked to a V-slot (28). This does not require cophonologies or a different/special constraint ranking for loanwords, it is a simple representational solution based on the general phonological condition that linked vowels are not subject to stray erasure.

#### (28) Non-alternating forms have linked final vowels

a. UR of [tʃísle] ‘chisle’

C	V	C	<u>V</u>	C	V
tʃ	i	s		l	e

<sup>18</sup> This is somewhat of a notational variant of Blevins’ analysis (1994) (more so than it may seem), because the lexical position of that extra Empty CV can still follow Blevins’ (1994) conditions which she calls ‘stress’.

<sup>19</sup> Though these seem to be developing towards a final long vowel, already in Blevins (1994) we have: [kænrée] ‘candle’.

## 4 Segmental alternations

This final section handles the surprising link between the presence of an onset in CVCV# and CV.V# roots and the very different segmental outcomes of the Incomplete.

The root shapes CV.V# and CVCV# have different outcomes in the Incomplete. Crucially, CV.V# roots do not undergo metathesis: /lelei/ \*lelie ‘good’ (cf. /kaleŋa/ [kaljaŋ] ‘to appear to’ (Besnier 1987:214)).

The CVCV# roots (see the table in (6)) undergo umlaut and other segmental changes, while these processes are blocked with CV.V# roots (details in (7)): CVCV# /kɔfɛ/ > [køf] ‘coffee’ vs. CV.V# /mɔ.ɛ/ > \*[mø:] ‘brown’.

The Incomplete forms of CV.V# roots have their own segmental changes, chief among which is a desonorisation of the root’s floating vowel: /mɔ.ɛ/ > [mɔj] ‘brown’.

### 4.1 Floating vowels in CV.V-final roots

What defines the Incomplete paradigm is the inability of the root-final floating vowel to link to the V above it (V<sub>3</sub> in (29)). As is shown in (29), the floating vowel then seeks to associate to the closest possible landing site. It seems that in CV.V# roots, the closest and best docking site is the empty C (C<sub>3</sub>) immediately to the left of the root’s silenced final V slot (V<sub>3</sub>).

(29) CV.V# form Incomplete derivation

a. UR /lelei/

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C <sub>3</sub>	V <sub>3</sub>
l	e	l	e		i

b. [leléj] ‘good’ (Incomplete) (cf. [lelé.i] ‘good’ (Complete))

			*)		
			*		*
C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C <sub>3</sub>	<u>V<sub>3</sub></u>
l	e	l	e	i	i

This leads to the ‘desonorisation’ of the floating vowel (cf. Churchward 1940; Cairns 2007)<sup>20</sup> as it is converted into a VC sequence. Cairns (2007), who worked with native speaker informant, reports: j[á.o] > j[áw] ‘spear’, tu.[é.i] > tu[éj] ‘cutting edge of grater’.

<sup>20</sup> It is perhaps unusual to have an analysis where even low vowels can occupy, these become desonorised though to what extent is not clear from the descriptions, more research is needed to establish the precise phonetics of the outputs, however, in terms of their phonological behaviour they clearly pattern as VC sequences.

The structure in (29) also explains the stress and length changes in the Incomplete form of CV<sub>1</sub>.V<sub>2</sub># roots. Churchward (1940) describes the V<sub>1</sub> in these sequences as becoming somewhat shorter. Also that stress spans over the whole V<sub>1</sub> and V<sub>2</sub> sequence.<sup>21</sup>

In my analysis, the contrast with the Complete forms of CV.V# roots comes from the comparison between open and closed syllables.

In the Complete forms, CV.V# roots surface with a hiatus sequence. In terms of stress and phonetic length, CV.V# roots are effectively identical to CVCV# roots. Stress is distributed fully on V<sub>1</sub>: C $\acute{V}$ <sub>1</sub>.V<sub>2</sub> (cf. C $\acute{V}$ <sub>1</sub>CV<sub>2</sub>). Phonetically, V<sub>1</sub> surfaces as prominent, with all the phonetic length afforded to short stressed vowels in open syllables (Churchward 1940). In Incomplete CV.V# roots, as shown in (29), V<sub>1</sub> sits in a closed syllable (preceding an empty V). This probably is enough to account for its compression/shortening. This is consistent with categorical closed vowel shortening seen in other languages (Yoshida 1993; Kaye 1995; Scheer 2004).

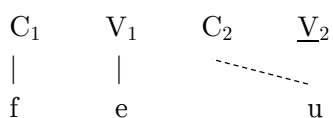
#### 4.2 Floating vowels in CVCV# roots

In Strict CV, there is a surprisingly simple representational solution for the fact that in Rotuman metathesis only occurs if the final syllable of the word contains a filled onset. These differences follow naturally from the shapes of roots. CV<sub>1</sub>.V<sub>2</sub># roots have an empty C position available for docking which does not change the relative order of surface segments: CV<sub>1</sub>.V<sub>2</sub># → CV<sub>1</sub>C<sub>2</sub># (see 30)

(30) CV.V# root /fe.u/ > [few] ‘tail’

V<sub>2</sub> is silenced by DFP

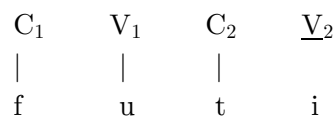
Floating vowel moves to C<sub>2</sub>



With C<sub>1</sub>V<sub>1</sub>C<sub>2</sub>V<sub>2</sub># roots, however, C<sub>2</sub> is not available to be docked to by a vowel. So instead, the floating vowel merges as a segment with the next closest suitable position (V<sub>1</sub>), eventhough this leads to coalescence (31b).<sup>22</sup>

(31) Floating vowel docking in CVCV roots /futi/ [fyt] ‘banana’ Complete

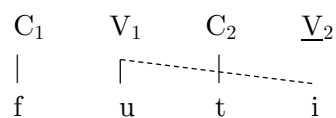
a. CVCV with final silenced V



<sup>21</sup> McCarthy (2000) analyses these as heavy diphthongs. In fact, there are phonological analyses of heavy diphthongs as VC sequences in English (Kristó 2015; Szigetvári 2017).

<sup>22</sup> Although other possibilities could have become grammaticalised.

- b. Unlike roots with an empty C, the floating vowel docks to V<sub>1</sub>



Though much more could be said about the specific segmental changes that happen when the floating vowel is fused as a segment under V<sub>1</sub>, the important point for this paper is that it is the difference between CV.V# and CVCV# roots with nothing more than the shape of the root. There is no appeal to the syllabic weight of codas (*pace* McCarthy 2000), for which there is no independent evidence in Rotuman.

These representations offer a similar but perhaps clearer solution to McCarthy (2000)'s explanation for vowel coalescence/umlaut occurring only in light diphthongs (not the heavy ones).

As we see in (30b) in contrast with (31b), the floating vowel ends up sitting in entirely different CVs in the Incomplete of these two root shapes. The floating vowel occupies a different skeletal slot to the stressed vowel (C<sub>3</sub> as opposed to V<sub>2</sub>). This is why in Incomplete CV.V#'s there is no attempt at umlaut/coalescence.

## 5 Conclusion

This paper presents a Strict CV account of Rotuman. It handles this infamously intricate case of non-concatenative morphology using only additive processes respecting strict modularity. The solution crucially depends on the nature of the representation of roots and affixes. In line with the analysis of non-epenthetic segment-zero alternations in other languages, I hypothesise that in Rotuman most roots end in floating vowels.

As is standard in Strict CV, the surfacing of floating vowels is contingent on their phonological surroundings. Silenced positions (either by the domain-final parameter, or the force of Government) do not allow floating vowels to dock. Certain vocabulary items are hypothesised to be wholly empty (pure skeletal structure). The underlying representation of the vocabulary items interact with each other according to regular phonological computational principles and derive the Complete and Incomplete forms. This account of the segment-zero alternation predicts that final long vowels will not alternate between the Complete and Incomplete. Long vowels are 'fixed' to the skeleton in the UR, this is actually a characteristic that is shared by the few non-alternating roots that end in final short vowels.

Compounding and affixing are compared and I conclude that affixes in Rotuman contain minimally two CV units (just like roots). The difference is that the first CV of the suffixes may be featurally empty. This generates the correct set of syllable structure alternations between Complete and Incomplete paradigms.

The Strict CV representations are able to explain why metathesis only occurs in underlyingly CVCV roots and not CV.V ones. The floating vowel, if it cannot link to the V slot above it, moves to link to the empty C of the CV.V# root. If, however, that empty C position is filled then the floating vowel attempts to link to the preceding vowel position leading to umlaut.

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