AN OPTIMALITY-THEORETIC ACCOUNT OF SYLLABLE RESTRUCTURING IN EARLY BISLAMA

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Abstract: The paper looks at syllable restructuring in Early Bislama. The analysis is couched in the framework of Optimality Theory. The empirical evidence considered is from a corpus of pre-World War II records of Early Bislama, covering a period ranging from 1867 to 1935. It is shown that Early Bislama tends to disallow complex syllable margins and employs mostly vowel epenthesis and, to a lesser extent, consonant deletion as repair strategies for the resolution of etymological onset and coda clusters. Also discussed are the quality of the epenthetic vowels (minimally marked vs. contextually coloured), and the relevance of Early Bislama to the transformations undergone by otherwise stable features of English syllable structure.

Keywords: syllable restructuring, Optimality Theory, Early Bislama, onset clusters, coda clusters

1. Introduction

As noted by Crowley (2008: 161), "matters of phonology have typically […] been covered briefly (or not at all) in published material relating to Bislama". The present paper is then a contribution to the study of the under researched phonology of Bislama. It is concerned with syllable restructuring in the early, pre-World War II stages of the language.

Bislama is an English-lexifier language spoken in the Republic of Vanuatu, formerly known as the New Hebrides Condominium. Today it is the national language of the country (Crowley 1990). For most of its users, Bislama is a second language, i.e. it functions as an expanded pidgin[1]. However, according to Crowley (2008: 145), "it has gradually been acquiring small numbers of first-language speakers", up to "possibly ten percent of the population", i.e. it has been creolized.

Historically, Bislama is a descendant of Melanesian Pidgin English, whose two other modern offshoots are Tok Pisin, spoken in Papua New Guinea, and Pijin, spoken in the Solomon Islands. Bislama emerged in the southern islands of Vanuatu and the Loyalty Islands of New Caledonia by the 1860s (Crowley 1990: 60-65). It developed in a multilingual contact situation and became stabilized in the first decades of the 20th century (Tryon & Charpentier 2004: 1908).

Even today, Vanuatu is a highly multilingual nation, with some 80 actively spoken languages by its population of approximately 200,000, having "the most complex linguistic demography of any country in the world in terms of languages per head of population" (Crowley 2008: 144). The local vernaculars, i.e. the substrate languages of Bislama, belong to the Southern Oceanic linkage of the Oceanic branch of the Austronesian languages.

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[1] See the four stages in pidgin development distinguished by Mühlhäusler (1997): jargon (also known as minimal pidgin/pre-spidgin), stable pidgin, expanded pidgin and creole.

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Generally, as mentioned by Crowley et al. (2011: 34), Oceanic languages "are frequently phonologically less complex than those of many other linguistic groupings in the world" and their "syllable structures tend to approximate a simple CV type". According to Lynch (1998: 84), "probably the majority of Austronesian languages, however, allow both open and closed syllables (syllables ending in a consonant)", but "there are few consonant clusters, and they mainly occur across morpheme boundaries".

More specifically, with respect to the languages spoken in Vanuatu, Tryon (1987: 9) states that "there is a restriction which is common in Polynesian languages, namely that sequences of two or more consonants within the same syllable cannot occur together". Tryon (1987: 9) further writes that "in many Vanuatu languages these sequences of consonants must be separated by a vowel". Under the circumstances, it is only to be expected that the substrate languages should exert considerable influence on the syllable structure of Bislama, *a fortiori* in its earlier stages. Indeed, as will be shown, Early Bislama tends to disallow complex syllable margins.

The paper is organized as follows. Section 2 presents the corpus and the methodology. Section 3 outlines the theoretical framework. Section 4 analyzes the Early Bislama reflexes of etymological onsets and codas. Section 5 summarizes the findings.

2. Corpus and methodology

A corpus of Early Bislama texts has been searched with a view to identifying forms relevant to the treatment of etymological onset and codas.

The corpus of Early Bislama consists of pre-World War II records, covering a period ranging from 1867 to 1935. The textual evidence includes travelogues (Giles 1968 [1877], Wawn 1893, Grimshaw 1907, Speiser 1913, Johnson 1922, Titaÿna & Lugeon 1931), memoirs (Paton 1894, Watt 1896, Alexander 1927, Marshall 1937), letters (Fletcher 1923, 1924), descriptions of the New Hebrides (Imhaus 1890, Baker 1929, Harrisson 1937), a play (Jacomb 1929), grammatical and lexical sketches of Early Bislama (Pionnier 1913, Jacomb 1914: 90-104), and the samples of Early Bislama in Tryon & Charpentier (2004).

As noted by Crowley (1998: 63-64), "actual [Early] Bislama attestations appear in a variety of guises". These include "straightforward statements about how to say a particular thing in Bislama", e.g. in Pionnier (1913) and Jacomb (1914: 90-104), "quoting the words of ni-Vanuatu speaking Bislama, or of Europeans addressing ni-Vanuatu", and "lexical items, or perhaps phrases, embedded within a sentence in English". Moreover, many of the earlier records of Bislama are often rendered in an anglicized version, as in most early records of English-lexifier pidgins and creoles[2]. The forms collected and transcribed by Père Pionnier, a French missionary, are an important exception in this respect. According to Crowley (1993: 210), "there is no indication that he had any speaking knowledge of English at all". However, Père Pionnier or "the person who actually prepared the article for publication, knew some written English" (Crowley 1993: 218), but "the level of English was clearly not high, as there are mistakes" (Crowley 1993: 224,

[2] For a discussion of the issues involved see e.g. Hancock (1977) and Avram (2000).

n. 7). On the whole, therefore, "normalizing", i.e. "etymologizing" transcriptions are less likely in this case.

All examples are reproduced in the orthography used in the sources. The entries include the date of the attestation, the English gloss, and the reference; in a few cases less transparent etyma are also indicated. The dates of the attestations are those mentioned in the primary sources or in Crowley (1998) and Tryon & Charpentier (2004). When an exact year could not be established a hyphen preceding it is used, which reads "in or before".

3. Theoretical framework

The theoretical framework is provided by Optimality Theory (Prince & Smolensky 1993, McCarthy & Prince 1993a, Kager 1999, McCarthy 2008).

Optimality Theory is a constraint-based model of phonology, based on the parallel evaluation of possible output forms with respect to a ranked set of violable constraints. Phonologies are constructed from the universal set CON (from "constraints"). The constraints in CON are ranked differently in the various languages. The phonology of a given language is defined by the particular ranking of the set of constraints. A distinction is made between active and inactive constraints. The latter never have an impact on the language analyzed, i.e. they never eliminate output forms no matter what input form is being evaluated.

For any input form a component GEN (from "Generator") generates a set of reasonable plausible candidates. Candidates are then evaluated by EVAL (from "Evaluation") with respect to that language's constraint hierarchy, i.e. they are checked whether they satisfy the requirements imposed by the respective constraints. Those candidates that fail to do so are eliminated. The process of selection continues until there remains one single output form. This is the optimal form, which may violate one or more of the lower ranked constraints. However, any such violation becomes irrelevant: the respective candidate form will still be the optimal form.

Evaluation is encapsulated in constraint tableaux. A tableau contains the input form, the constraints, and a number of potential output forms. The input form is given in the top left corner. Constraints are arranged horizontally in columns, in a left-to-right ordering reflecting their ranking. Output forms are placed vertically in rows. The cells contain violation marks * incurred by each candidate form. An asterisk * in a cell indicates that the output form has violated the constraint heading the column. An asterisk followed by an exclamation mark *! shows that a candidate form which has violated a constraint is eliminated. The optimal form is marked by the index ☞. Cells whose violation content is no longer relevant are shaded.

Finally, if constraints do not interact, their ranking is indifferent. The absence of strict ranking is indicated by a comma placed between the constraints at issue and by dotted vertical lines in the constraint tableaux.

In what follows, I first define and discuss the most important prosodic markedness constraints generally relevant to syllable structure. Next, I focus on correspondence constraints which model the identity between input and output.

3.1 Markedness constraints

The constraint *CODA requires that syllables must not end in a consonant. Languages in which the constraint *CODA is undominated have open syllables only.

(1) *CODA: Syllables are open.

The constraint *COMPLEX prohibits the occurrence of more than one consonant in the onset and in the coda.

(2) *COMPLEX: no complex syllable margins.

*COMPLEX is actually a cover constraint and can be decomposed into two well-formedness constrains, one for onsets and another for codas. The first one, *COMPLEXONS, bans the occurrence of more than one consonant in onset position.

(3) *COMPLEXONS: onsets are simple.

Languages in which *COMPLEXONS is active and undominated have simple onsets only. However, *COMPLEXONS may be construed as a family of sub-constraints such that a given language can prohibit some types of onset clusters while allowing others. The constraint *COMPLEXCODA prohibits the occurrence of more than one consonant in the coda.

(4) *COMPLEXCODA: codas are simple.

If *COMPLEXCODA is active and undominated, a language has simple codas only. *COMPLEXCODA represents a family of sub-constraints such that in a given language some types of onset clusters are banned while others are permitted. Several sub-constraints[3] of *COMPLEXONS and, respectively, *COMPLEXCODA assumed in my analysis will be introduced in the relevant sections.

Finally, consider the optimality-theoretic equivalent of the Sonority Sequencing Generalization or Sonority Sequencing Principle (Selkirk 1982, Clements 1990), which imposes that the sonority profile of a syllable must slope outwards from the nucleus.

(5) SON-SEQ: complex onsets rise in sonority and complex codas fall in sonority.

[3] For their motivation and cross-linguistic empirical evidence, not limited to pidgin and creole languages, in support of the constraints suggested, see Avram (2005).

In languages in which SON-SEQ is active and undominated all complex margins comply with sonority requirements. However, as is well known, in various languages there occur exceptions to sonority requirements. Depending on the language at issue, SON-SEQ is either inactive or it is a family of sub-constraints.

3.2 Correspondence constraints

In correspondence theory (Sherrard 1997: 68-77, Kager 1999: 248-252) violations are assessed by directly examining the relation holding between input and output. The elements of two phonological representations are seen as being related by a mapping from one to the other. Correspondence is defined as follows:

(6) Correspondence: In two strings S_1 and S_2, related to one another as input-output, correspondence is a relation $\mathcal{R}$ from the elements of S_1 to those of S_2. Elements $\alpha \in S_1$ and $\beta \in S_2$ are referred to as correspondents of one another when $\alpha \mathcal{R} \beta$.

The component GEN (from "Generator") supplies pairs of strings S_1 and S_2 as well as the correspondence relationships between the elements of these strings. Correspondence is a relationship evaluated by constraints. Constraints evaluating correspondence relations are violable. Optimal forms display various imperfect correspondence relationships, such as deletion, epenthesis, featural change, etc.

The relevant families of constraints are MAXIMALITY, DEPENDENCE. The members considered are MAX-IO and DEP-IO, respectively.

The first constraint family, MAXIMALITY, has as one of its members the constraint MAX-IO, which prohibits deletion[4].

(7) MAXIMALITY
Every element of S_1 has a correspondent in S_2.
Members: S_1 S_2
MAX-IO Input Output
Effect: no deletion of segments

The relevant member of the second family of constraints is DEP-IO, which militates against epenthesis[5].

(8) DEPENDENCE-IO
Every element in S_2 has a correspondent in S_1.
Members: S_1 S_2
DEP-IO Input Output
Effect: no epenthesis of segments

[4] The overall effect of MAX-IO is similar to that of PARSE in McCarthy and Prince (1993a).
[5] The overall effect of DEP-IO is similar to that of FILL in McCarthy and Prince (1993a).

In addition to these families of constraints, two other constraints have to be mentioned: CONTIGUITY and ANCHORING. The relevant members are CONTIG-IO and ANCHOR-IO respectively.

CONTIGUITY bans both medial epenthesis and medial deletion:

(9) CONTIGUITY
The portion of S_1 standing in correspondence forms a contiguous string, as does the correspondent portion of S_2.
Members: S_1 S_2
CONTIG-IO Input Output
Effect: no medial epenthesis or medial deletion of segments

The constraint ANCHORING imposes edge-in mapping:

(10) ANCHORING
Any element at the designated periphery of S_1 has a correspondent at the designated periphery of S_2.

ANCHORING prohibits epenthesis or deletion at the edges[6]. ANCHORING is decomposed into RIGHT-ANCHOR and LEFT-ANCHOR (Sherrard 1997: 69, Kager 1999: 251):

(11) RIGHT-ANCHOR
Members: S_1 S_2
ANCHOR-IO Input Output
Effect: no epenthesis or deletion at the right edge

(12) LEFT-ANCHOR
Members: S_1 S_2
ANCHOR-IO Input Output
Effect: no epenthesis or deletion at the left edge

4. Syllable restructuring in Early Bislama

This section looks at syllable restructuring as evidenced in the available records of Early Bislama.

In 4.1 the focus is on the treatment of various types of etymological onset clusters while 4.2 is concerned with the Early Bislama reflexes of etymological word-medial coda clusters and codas in word-final position.

[6] In line with e.g. Kager (1999: 137), ANCHORING subsumes the Generalized alignment constraints in McCarthy & Prince (1993b).

4.1 Onsets

As shown in what follows, only some types of onset cluster undergo reduction in Early Bislama. In the corpus, I have identified a number of faithful renderings of reflexes of obstruent + liquid onset clusters in the etyma:

(13) /pr-/
-1919 *copperah* 'copra' (Fletcher 1923: 326)
(14) /fr-/
-1899 *Forailleray* 'Friday' (Pionnier 1913: 193)
(15) /dr-/
a. -1919 *derrown* 'to drown' (Fletcher 1923: 330)
b. -1919 *derronk* 'drunk' (Fletcher 1923: 329)
c. -1919 *derrink* 'to drink' (Fletcher 1924: 121
(16) /gl-/
-1919 *Ingerlish* 'English' (Fletcher 1923: 329)
(17) /gr-/
a. -1899 *guirisse* 'fat' (Pionnier 1913: 116)
b. -1899 *angérè* 'hungry' (Pionnier 1913: 119)

In all these cases, Early Bislama resorts to vowel epenthesis. In optimality-theoretic terms, I assume the constraint *ONS/OL, defined as follows:

(18) *ONS/OL: clusters of obstruent and liquids are disallowed in onset position.

As for the nature of the epenthetic vowel, the preferred solution seems to have been a default vowel. In Early Bislama, presumably as an illustration of the variation typical of pidgins not yet stabilized, the epenthetic vowel at issue is [e] or, as shown below, [i][7]. Its choice is enforced by the following constraint:

(19) DEF-V: insert a default vowel into an etymological cluster[8].

Both *Ons/OL and DEF-V crucially dominate DEP-IO and are ranked high in the hierarchy in Early Bislama:

(20) *ONS/OL, MAX-IO, LEFT-ANCHOR, DEF-V >> DEP-IO, CONTIGUITY

Consider the evaluation of candidates for e.g. the input *drown*:

[7] Further evidence that [e] and [i] are the default epenthetic vowels in Bislama is provided in 4.2.3. See also section 5.
[8] See also Stanton & Zufoff (2018: 640) for a different formulation of the default vowel constraint.

Tableau 1

/draɑn/	*ONS/OL	MAX-IO	L-ANCHOR	DEF-V	DEP-IO	CONTIG
draun	*!					
daun		*!				
raun		*!	*!			
ed.raun			*!		*	
da.raun				*!		*
☞ de.raun					*	*

Two forms, *guirisse* and *angérè* are ambiguous cases, i.e. they could be either illustrations of epenthesis of default [i]/[e] or of a vowel copy. Such cases are considered here as instances of vowel copying: the choice of a vowel copy, i.e. the special case, takes precedence over the selection of the default epenthetic vowel, i.e. the general case. Epenthesis with vowel copying is enforced by the constraint COPY:

(21) COPY: epenthesize a copy of the etymological vowel.

Etymological vowel is understood here as the vowel following the etymological onset cluster. The corresponding hierarchy of constraints including the constraint COPY is:

(22) *ONS/OL, MAX-IO, LEFT-ANCHOR, COPY >> DEF-V, DEP-IO, CONTIGUITY

Tableau (2) shows the interplay of these constraints:

Tableau 2

/gri:s/	*ONS/OL	MAX-IO	L-ANCHOR	COPY	DEF-V	DEP-IO	CONTIG
gris	*!						
gis		*!					
ris		*!	*!				
ig.ris			*!			*	
ge.ris				*!		*	*
☞ gi.ris					*	*	*

Yet another strategy for the resolution of these illicit clusters is illustrated by *forailleray*, presumably [forairai]. This form exemplifies transcategorial progressive assimilation[9] of the V-to-C type: the epenthetic vowel assimilates to the preceding consonant: the [LABIAL][10] fricative /f/ imposes the selection of a [LABIAL] epenthetic vowel[11], i.e. [o]. This can be accounted for in terms of the constraint C_{LAB}-V_{LAB}:

(23) C_{LAB}-V_{LAB}: insert a [LABIAL] vowel between a [LABIAL] obstruent and the liquid.

The constraint C_{LAB}-V_{LAB} must obviously outrank COPY, DEF-V and DEP-IO in the hierarchy of constraints:

[9] As defined by Clements (1993: 109).
[10] Major or primary place features are assumed to be unary.
[11] This type of assimilation is frequently referred to as "labial attraction" in the literature.

(24) *ONS/OL, MAX-IO, LEFT-ANCHOR, C_{LAB}-V_{LAB} >> COPY, DEF-V, DEP-IO, CONTIGUITY

Tableau 3 evaluates the competing candidates in light of the ranking suggested:

Tableau 3

/fraɪdei/	*ONS/OL	MAX-IO	L-ANCHOR	C_{LAB}-V_{LAB}	COPY	DEF-V	DEP-IO	CONTIG
frai.rai	*!							
fai.rai		*!						*
rai.rai			*!					
ef.rai.rai			*!		*		*	
e.rai.rai				*!	*		*	*
fa.ra.rai				*!		*		
☞ fo.rai.rai					*	*	*	*

In conclusion, the available data seem to indicate that Early Bislama favours default epenthetic vowels in the resolution of illicit obstruent + liquid onset clusters. Occasionally, vowel copying and transcategorial assimilation of the epenthetic vowel also occur. Such variability is not surprising, given the unstable nature of early pidgins.

As for obstruent + glide clusters, these appear to be permitted in Early Bislama:

(25) /tw-/
-1899 *touaneté* 'twenty (Pionnier 1913: 187)

(26) /kw-/
a. -1914 *quick* 'quick' (Jacomb 1914: 94)
b. -1919 *quinine* 'quinine' (Fletcher 1924: 154)
c. -1935 *quick time* 'quickly' (Harrisson 1937: 146)

Consider next the treatment of /s/-initial clusters. The forms reproduced in (27) through (29) illustrate the adjustment of /s/ + obstruent clusters:

(27) /sp-/
-1899 *soupoune* 'spoon' (Pionnier 1913: 115)

(28) /st-/
a. -1899 *sitil* 'to steal' (Pionnier 1913: 185)
b. -1899 *sitima* 'steamer' (Pionnier 1913: 115)
c. 1931 *sitone* 'stone, rock' (Titaÿna & Lugeon 1931: 31)

(29) /sk-/
a. -1899 *sikine* 'skin; body' (Pionnier 1913: 193)
b. -1899 *sikinime* 'to peel' (Pionnier 1913: 191)

The fact that the Early Bislama reflexes of these /s/-initial etymological clusters exhibit an epenthetic vowel can be captured by means of the constraint *ONS/sO:

(30) *ONS/sO: onsets may not consist of /s/ followed by an obstruent.

The undominated constraint *ONS/sO imposes the reduction of such clusters via vowel epenthesis. The epenthetic vowel is either [i] – one of the two default epenthetic vowels in Bislama – or a copy of the vowel following the illicit onset cluster. In the former case, the hierarchy of constraints is:

(31) *ONS/sO, MAX-IO, LEFT-ANCHOR, DEF-V >> COPY, C_{LAB}-V_{LAB}, DEP-IO, CONTIGUITY

This ranking secures the emergence of *sitone* as the optimal output form:

Tableau 4

/stəʊn/	*ONS/sO	MAX-IO	L-ANCHOR	DEF-V	COPY	C_{LAB}-V_{LAB}	DEP-IO	CONTIG
ston	*!							
ton		*!	*					
son		*!						*
☞ si.ton					*		*	*
so.ton				*!			*	*
is.ton			*!				*	*

As for the form *soupoune*, it obtains from the following ranking in which includes the constraint COPY is undominated:

(32) *ONS/sO, MAX-IO, LEFT-ANCHOR, COPY >> C_{LAB}-V_{LAB}, DEF-V, DEP-IO, CONTIGUITY

The corresponding evaluation is given in the tableau below:

Tableau 5

/spu:n/	*ONS/sO	MAX-IO	L-ANCHOR	COPY	C_{LAB}-V_{LAB}	DEF-V	DEP-IO	CONTIG
spun	*!							
pun		*!	*					
sun		*!						*
☞ su.pun						*	*	*
si.pun				*!				
is.pun			*!	*			*	*

Onset clusters made up of /s/ and a nasal stop appear to have been disallowed[12]:

(33) /sm-/
-1899 *sémèle* (Pionnier 1913: 191)

This is the effect of the undominated constraint *ONS/sN, defined as follows:

(34) *ONS/sN: an onset may not consist of /s/ and a [+nasal] stop

[12] The resolution of this type of onset cluster is not illustrated by any other form in the corpus.

This type of cluster is broken up via epenthesis of a vowel copy. This can be accounted for by positing the following ranking:

(35) *ONS/sN, MAX-IO, LEFT-ANCHOR, COPY >> C_{LAB}-V_{LAB}, DEF-V, DEP-IO, CONTIGUITY

Given this ranking, *sémèle* is the best candidate:

Tableau 6

/smɛl/	*ONS/sN	MAX-IO	L-ANCHOR	COPY	C_{LAB}-V_{LAB}	DEF-V	DEP-IO	CONTIG
smel.	*!							
mel		*!	*					
sel		*!						*
☞ se.mel							*	*
si.mel				*!			*	*
es.mel			*!				*	

The onset clusters /sl-/ and /sw-/ survive as such, as shown by the examples below:

(36) /sl-/
- a. -1899 *slipe* 'to sleep' (Pionnier 1913: 191)
- b. -1914 *sleep* 'to sleep' (Jacomb 1914: 94)
- c. -1919 *sleep* (Fletcher 1924: 121)
- d. -1914 *slack im* 'to strike matches' (Jacomb 1929: 30)
- e. -1934 *sleep* 'to sleep' (Marshall 1937: 91)
- f. -1935 *sleep* 'to sleep' (Harrisson 1937: 146)

(37) /sw-/
- a. -1914 *swim* 'to bathe' (Jacomb 1914: 96)
- b. -1914 *sweet* 'sweet' (Jacomb 1914: 98)
- b. -1919 *sweat* 'to sweat' (Fletcher 1924: 154)
- c. -1934 *swim* 'to swim' (Marshall 1937: 71)

In conclusion, not all types of complex onset undergo reduction in Early Bislama. It follows that the constraint *COMPLEXONS cannot account for the different treatment of the various types of onset cluster. The resolution of these complex onsets is handled by several of its sub-constraints.

Note finally that vowel epenthesis reduces both clusters that violate SON-SEQ, i.e. /s/ + oral stop clusters, and those that do not, i.e. obstruent + liquid and /s/ + nasal stop clusters.

4.2 Codas

The following analysis of the treatment in Early Bislama of etymological codas takes into account both the position within the word and the type of cluster which undergoes restructuring.

The adjustment of etymological word-final simplex codas is discussed in 4.2.1. In 4.2.2 I look into the resolution of the following types of illicit word-final coda clusters: velar stop + /s/ or /z/; nasal stop + /θ/ or /s/; nasal stop + affricate; consonant + /t/ or /d/; /l/ + stop. Finally, 4.2.3 addresses the issue of reflexes of in word-medial codas.

4.2.1 Word-final simplex codas

A number of Early Bislama forms etymologically derived from words with singleton codas appear to exhibit paragogic vowels. However, there is evidence which suggests that these forms should not be taken at face value.

Two such forms are reflexes of etyma ending in the voiceless stop /p/:

(38) /-p/
  a. -1899 *supa* ‘soup’ (Pionnier 1913: 116)
  b. -1914 *seepy* ‘sheep’ (Jacomb 1914: 101)

However, the above forms are less relevant than they appear to be at first sight. The form *supa* is not attested either in Melanesian Pidgin English or in any other source for Early Bislama. Also, one of the Modern Bislama forms for ‘soup’ is *supsup*[13], without an intrusive vowel. An identical form is also attested in Pijin[14]. This suggests that *supsup* would have existed in Early Bislama as well. If so, the non-reduplicated forms[15] attested in Modern Bislama are later developments. Moreover, the non-etymological word-final vowel in *supa* is [a], i.e. neither a vowel copy, nor a [labial], vowel, nor default [i]/[e]. It may therefore be presumed that the word-final <a> in the form *supa* ‘soup’ in Pionnier (1913) is an error of transcription and does not represent a paragogic vowel. A similar case can be made against *seepy*. The fact that the Modern Bislama, Tok Pisin and Pijin forms are *sipsip*[16] shows, as noted by Crowley (1998: 96), “that the reduplicated form had early currency” and that the form *sipi*, with an intrusive vowel copy, recorded by Jacomb (1914) “represented a temporary development”.

The next set of forms under (39)-(41), are all derived from etyma ending in /-ŋ/:

(39) /-ŋ/
  a. 1878 *alonga* ‘in’ (Wawn 1893: 144)
  b. 1880s *alonga* ‘in’ (Thomas 1886: 359)
  c. 1890 *along-a* ‘in’ (Tryon & Charpentier 2004: 234)

(40) /-ŋ/
  a. 1877 *longa* ‘in’ (Giles 1968 [1877]: 37)
  b. -1919 *longa* ‘to’ (Fletcher 1923: 327), ‘with’ (Fletcher 1923: 325) ‘because’ (Fletcher 1923: 329)

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[13] See Guy (1974: 203), Crowley (2003: 266)
[14] See Jourdan & Maebiru (2002: 233).
[15] These are *sup* < English *soup* (Crowley 2003: 266) and *lasup* < French *la soupe* (Guy 1974: 203).
[16] See Guy (1974: 153), Crowley (2003: 383) for Modern Bislama, Volker et al. (2008: 90) for Tok Pisin, and Jourdan & Maebiru (2002: 211) for Pijin.

(41) /-ŋ/
a. 1869 *belong-a* 'of' (Watt 1896: 369)
b. 1870 *belong-a* 'of' (Kay 1872: 79)
c. 1878 *belonga* 'of' (Wawn 1893: 143)
d. 1880s *belong a* 'of' (Thomas 1886: 246)
e. 1890 *belong-a* 'of' (Tryon & Charpentier 2004: 234)

All these forms are widely attested in late 19th-century varieties of Melanesian Pidgin English[17]. Moreover, the intrusive word-final vowel is once again [a], and not a vowel copy or default [i]/[e]. To conclude, these forms appear to be illustrative of the pre-stabilization stage of Bislama.

One last example, derived from an etymon ending in /-l/, is reproduced below:

(42) /-l/
-1919 *killa* 'to hit' (Fletcher 1923: 326)

This form should also be dismissed as doubtful. Firstly, this is the only occurrence of such a reflex of English *kill*. Secondly, this form does not contain the expected transitive suffix *-im*. Thirdly, the expected intrusive vowel would have been either a vowel copy or default [e].

To conclude, etymological word-final simple codas surface as such in Early Bislama. It follows that *CODA does not play a role in syllable restructuring in Early Bislama.

4.2.2 Word-final complex codas

As shown below, complex codas are disallowed in Early Bislama. However, the composition of complex codas determines the way in which they are treated. Therefore, simply assuming the undominated constraint *COMPLEXCODA would not explain the differences between the early Bislama reflexes of various etymological coda clusters. These differences essentially obtain from the interaction of other constraints and *COMPLEXCODA will therefore not be included in the rankings suggested in what follows.

A first such type of coda cluster consists of the oral stops /k/ or /g/ followed by the fricatives /s/ or /z/. Reflexes of etymological /-ks/, as in the examples under (43), are particularly well represented, in several sources, covering a period of more than sixty years:

(43) /-ks/
a. 1867 *bokis* 'box' (Paton 1894: 77)
b. -1899 *bokis* 'box' (Pionnier 1913: 115)
c. -1899 *sikis* 'six' (Pionnier 1913: 187)
d. -1912 *ackis* 'axe' (Alexander 1927: 214)

[17] See Tryon & Charpentier (2004) and Avram (2005: 200).

e. -1912 *bokkis* ‘box’ (Alexander 1927: 213)
f. -1912 *sikis* ‘six’ (Alexander 1927: 214)
g. -1914 *bokis* ‘box’ (Jacomb 1914: 99)
h. -1914 *sikis* ‘six’ (Jacomb 1914: 95)
i. -1917 *ackus* ‘axe’ (Johnson 1921: 48)
j. -1917 *bokkus* ‘box’ (Johnson 1921: 170)
k. -1927 *bokus* ‘box’ (Baker 1929: 17)

(44) /-gz/
-1899 *en’guis*[18] ‘egg’ (Pionnier 1913: 116) < E *eggs*

The illicit coda clusters at issue are resolved via the epenthesis of the default vowel [i] or [e]. The spelling <-us>, as in (43i), (43j) and (43k), presumably represents [-es].

Consider next the Early Bislama reflexes of English coda clusters made up of a nasal stop and the fricatives /θ/ or /s/:

(45) /-nθ/
-1899 *maniche* ‘month’ (Pionnier 1913: 112)

(46) /-ns/
a. -1899 *baniche* ‘fence’ (Pionnier 1913: 117)
b. -1914 *fenys*[19] ‘fence’ (Jacomb 1914: 99)
c. -1912 *banis* ‘fence’ (Alexander 1927: 214)
d. -1934 *danis* ‘dance’ (Marshall 1937: 88)

Note that Pionnier (1913) has [-ʃ] as the Early Bislama reflex of both /-θ/ and /-s/. The latter, however, surfaces as [-s] in other sources. This may reflect inter-speaker variation[20].

The following four forms illustrate the fate of etymological nasal stop + affricate coda clusters:

(47) /-nʧ/
a. -1914 *lanish* ‘speedboat’ (Jacomb 1914: 96) < E *launch*
b. -1919 *Frennich* ‘French’ (Fletcher 1923: 328)
c. -1919 *lannitch* ‘speedboat’ (Fletcher 1923: 325)
d. 1931 *lanich* ‘speedboat’ (Titaÿna & Lugeon 1931: 31)

(48) /-nʤ/
-1899 *oranige* ‘orange’ (Pionnier 1913: 116)

As can be seen, the Early Bislama reflexes of English /-ʧ/ is [ʃ], in (47a) and (47d), or [ʧ], in (47b) and (47c). Note, however, that the latter forms are produced by a “white

[18] Where <n’g> presumably stands for the pre-nasalized stop [ᵑg], as a reflex of etymological /g/. See Tryon (1987: 6) for the occurrence of intervocalic pre-nasalizes stops in Modern Bislama.
[19] Jacomb (1014: 103) specifies “Fence pronounced fenys”.
[20] The same holds for Modern Bislama. Tryon (1987: 6) states that “/s/ is normally realised as [s] in the Bislama of most speakers, only occasionally as sh”.

man" and are therefore not necessarily representative. As for English /-ʤ/, the French orthography used by Pionnier (1913) suggests that its Early Bislama reflex is apparently [ʒ], as in (48). This is rather unlikely, on the following grounds. In Modern Bislama, as shown by Crowley (2004: 11) "the contrast between voiced and voiceless segments is lost word-finally […] with only voiceless segments being found"; in all likelihood, the same must have held for the earlier stages of the language[21]. Moreover, Pionnier (1913: 117) himself has *cabiche* 'cabbage', where etymological /ʤ/ corresponds to Early Bislama [ʃ], as the spelling with <che> indicates. At any rate, these coda clusters are also broken up via epenthesis of default [i].

In light of the examples under (43) through (48), it may be concluded that Early Bislama does not allow consonant + fricative clusters in coda position. This can be handled by the well-formedness constraint *CODA/CF, defined below:

(49) *CODA/CF: a cluster made up of a consonant and a fricative is not a permissible coda.

The constraint dominates DEP-IO and CONTIGUITY. The hierarchy of constraints is:

(50) *CODA/CF, MAX-IO, RIGHT-ANCHOR, DEF-V >> COPY, DEP-IO, CONTIGUITY

The validity of this ranking is demonstrated in the following tableau:

Tableau 7

/bɔks/	*CODA/CF	MAX-IO	R-ANCHOR	DEF-V	COPY	DEP-IO	CONTIG
boks	*!						
bok		*!	*				
bos		*!					*
bok.si			*!			*	
bo.kos				*!		*	*
☞ bo.kis					*	*	*

The next set of forms are reflexes of etymological word-final codas consisting of a consonant followed by the oral stops /t/ or /d/:

(51) /-st/
  a. 1907 *firs'* 'first' (Grimshaw 1907: 240)
  b. -1914 *fas'* 'stuck' (Jacomb 1914: 97)

(52) /-nt/
  a. -1899 *wane* 'to want' (Pionnier 1913: 192)
  b. -1914 *kaun'* 'debt' (Jacomb 1914: 100) < E *account*
  c. -1914 *pine* 'point' (Jacomb 1914: 103)

[21] As shown by Rickford (1986: 162), "studies of current usage can be used to shed light on the interpretation of documentary texts".

(53) /-nd/
a. -1899 *biaïne* ‘behind’ (Pionnier 1913: 192)
b. -1899 *goraoune* ‘to go round’ (Pionnier 1913: 192)
c. -1899 *graoun* ‘ground’ (Pionnier 1913: 193)
d. -1899 *sane* ‘sand’ Pionnier 1913: 110)
e. -1899 *ouine* ‘wind’ (Pionnier 1913: 110)
f. 1907 *behin’* ‘behind’ (Grimshaw 1907: 240)

(54) /-lt/
-1899 *saul* ‘salt’ (Pionnier 1913: 116) < E *salt*

(55) /-ld/
a. -1899 *col* ‘cold’ (Pionnier 1913: 112)
b. -1912 *hole* ‘hold (in ship)’ (Alexander 1927: 214)

As can be seen, such clusters are reduced via deletion of /t/ or /d/, an effect of the well-formedness constraint *CODA/C+t/d/.

(56) *CODA/C+t/d: clusters made up of a consonant followed by a [−nasal, CORONAL] stop are not permitted in coda position.

The constraint hierarchy is:

(57) *CODA/C+t/d, DEP-IO, CONTIGUITY >> COPY, DEF-V, MAX-IO, RIGHT-ANCHOR

This ranking secures the selection of e.g. [win] as the optimal output form:

Tableau 8

/wɪnd/	*CODA/C+t/d	DEP-IO	CONTIG	COPY	DEF-V	MAX-IO	R-ANCHOR
wind	*!						
☞ win						*	*
wid			*!	*		*	
win.di		*!			*		*
wi.nid		*!	*		*		

One last type of etymological word-final coda cluster is /l/ + stop, whose adjustment is illustrated by a single form in the corpus:

(58) /-lk/
-1914 *milik*[22] ‘milk’ (Jacomb 1914: 103)

The constraint *CODA/LS accounts for the non-occurrence in Early Bislama of this type of cluster:

(59) *CODA/LS: a cluster made up of the liquid and a stop is not a permissible coda.

[22] Jacomb (1914: 103) writes explicitly: “Milk pronounced milik”.

In the relevant constraint hierarchy *CODA/LS and COPY dominate both DEP-IO and CONTIGUITY:

(60) *CODA/LS, MAX-IO, RIGHT-ANCHOR, COPY >> DEF-V, DEP-IO, CONTIGUITY

The interaction of these constraints is illustrated below:

Tableau 9

/milk/	*CODA/LS	MAX-IO	R-ANCHOR	COPY	DEF-V	DEP-IO	CONTIG
milk	*!						
mil		*!	*				
mik		*!					*
mil.ki			*!			*	
mi.lek				*!		*	*
☞ mi.lik					*	*	*

Summing up, complex word-final codas are illicit in Early Bislama. This also holds for clusters in which sonority decreases away from the nucleus, i.e. which respect the sonority requirements for codas. Therefore, as in the case of onset clusters, an analysis in terms of the constraint SON-SEQ cannot adequately account for the resolution of these illicit complex codas.

4.2.3 Word-medial codas

Only four forms relevant to the treatment of word-medial codas occur in the available records of Early Bislama. Three of these are reproduced below:

(61) /-t/
a. -1914 *taketer* 'doctor' (Jacomb 1914: 103)
b. -1919 *dokkitor* 'doctor' (Fletcher 1923: 333)

(62) /-l/
-1912 *allersame* 'as, like' (Alexander 1927: 214)

Given that Bislama seems to have always permitted simple codas[23], the forms in (61)-(62) are isolated cases. First, there is some evidence that these are possibly inherited as such from Melanesian Pidgin English. Crowley (1998: 72) writes that *dokita* "is attested as an occasional archaic variant in modem Bislama". Crowley (1998: 72) further notes that this "is also the shape of the word that was borrowed in the Loyalties"[24]. Also, a form similar to Early Bislama *allersame* is attested in Early Pijin: *alle same*[25]. Second, the fact that *dokita* 'doctor' and *allersame* 'as, like', with an epenthetic vowel, are isolated cases is also demonstrated by their extremely rare occurrence in a corpus of the modern variety of

[23] As seen in section 4.2.2.
[24] As mentioned by Tryon & Charpentier (2004: 205), Bislama was still spoken in the Loyalties at the beginning of the 20th century.
[25] See Avram (2007: 228).

the language (Bislama n.d.). Consider the Modern Bislama forms for ‘doctor’: *dokita* 0 matches vs. *dokta* 181 matches, in 101 documents. As for the Modern Bislama forms for ‘as, like’, the picture that emerges is even clearer: *olisem* 0 matches vs. 12516 matches, in 2908 documents.

Consider next the fourth form relevant to the fate of word-medial codas:

(63) -1899 *saulouara* ‘sea’ (Pionnier 1913: 193) < E *salt water*

As can be seen, the illicit word-medial cluster /-lt.w-/ undergoes reduction via deletion of /t/. This is the effect of the constraint *CODA/C+t/d:

*Coda/C+t/d outranks MAX-IO and RIGHT-ANCHOR. The hierarchy of constraints is:

(64) *CODA/C+t/d, DEP-IO, CONTIGUITY >> COPY, DEF-V, MAX-IO, RIGHT-ANCHOR

The ranking is demonstrated by the evaluation in the following tableau:

Tableau 10

/sɔ:lt wɔtə/	*CODA/C+t/d	DEP-IO	CONTIG	COPY	DEF-V	MAX-IO	R-ANCHOR
solt.wo.ta	*!						
☞ sol.wo.ta						*	*
sot.wo.ta			*!			*	
sol.ti.wo.ta		*!	*!				*
so.lit.wo.ta		*!	*	*			
so.lot.wo.ta		*!	*!		*		

5. Conclusions

In this paper I have analyzed syllable restructuring in Early Bislama, as evidenced in pre-World War II records. The findings can be summarized as follows.

The data in 4.1 show that obstruent + liquid, /s/ + obstruent and /s/ + nasal stop onset clusters undergo reduction whereas obstruent + glide and /s/ + liquid ones do not. Therefore, while it is not the case that *COMPLEXONS is always undominated in Early Bislama, it is the interplay of its sub-constraints which accounts for the differential treatment of onset clusters. Moreover, only /s/ + obstruent clusters violate sonority requirements. Hence, the constraint SON-SEQ is inactive in Early Bislama. All illicit onset clusters are subject to vowel epenthesis. Since consonant deletion is never an option, it follows that the crucial sub-hierarchy is MAX-IO >> DEP-IO.

As seen in 4.2, the constraint *COMPLEXCODA is undominated. However, it is rather the interaction of its various sub-constraints that adequately account for the fact that different complex codas are differently resolved. The fact that complex codas obeying sonority requirements also undergo reduction is further confirmation of fact that the constraint SON-SEQ is inactive in Early Bislama. The reduction of coda clusters most frequently involves epenthesis, imposed by the undominated constraints *CODA/CF or

*CODA/LS. However, also attested is deletion of word-final /t/ or /d/, enforced by the high-ranked constraint *CODA/C+t/d.

To sum up, Early Bislama evinces a strong tendency to avoid complex syllable margins. Also, there is a complex onset/complex coda asymmetry, given that coda clusters are always subject to reduction.

Several remarks are in order with respect to the quality of the epenthetic vowels in Early Bislama. As shown in 4.1 and 4.2.3, the epenthetic vowel can be, in increasing order of frequency: the [LABIAL] vowel [o], imposed by high-ranked constraint C_{LAB}-V_{LAB}; a vowel copy, enforced by the undominated constraint COPY; default [i] or [e], elsewhere.

Diachronically, epenthetic vowels lack input counterparts, i.e. they have no lexical feature specification. That is to say, the featural realization of epenthetic vowels is due exclusively to output factors. This accounts for the fact that in most languages epenthetic vowels tend to be minimally marked or underspecified segments. Cross-linguistically it is featurally unmarked vowels such as [i] or [e] that are selected in epenthesis. This is exactly the case of Early Bislama. Note also that Early Bislama is not the only Pacific English-lexifier contact language with two default epenthetic vowels: the same is true of e.g. Early Tok Pisin[26] and Early Pijin[27].

However, since epenthetic vowels lack an input, they may also be contextually coloured, i.e. subject to various sorts of assimilation. Indeed, in some languages epenthetic vowels undergo contextual colouring. Again, this is also the case of Early Bislama, which exhibits epenthesis with vowel copying (the effect of the constraint COPY) or with transcategorial assimilation of the C-to-V type (enforced by the constraint C_{LAB}-V_{LAB}). In optimality-theoretic terms, this can be expressed by the following factorial typology of the nature of the epenthetic vowel (Kager 1999: 125-126):

(i) Context-free markedness >> Context-sensitive markedness
Effect: epenthetic is minimally marked

(ii) Context-sensitive markedness >> Context-free markedness
Effect: epenthetic is contextually coloured

Kager (1999: 126) also writes that the interaction of context-free and context-sensitive markedness constraints "will not usually result in a complete victory of one factor over the other, but a more fragmented picture will be presented, with contributions made by both". Once again, this holds for Early Bislama, which resorts either to minimally marked epenthetic vowels or to contextually coloured ones.

Finally, the findings of the present paper are also relevant to the fate of some features of English syllable structure in language-contact situations, such as those in which pidgins emerge and develop. Blevins (2006: 14) identifies several what she calls "stable features of English word/syllable structure". These include the following (Blevins 2006: 14): onsets may be simple or complex; codas may be simple or complex; CR onsets are possible (R = liquid); sC onsets are possible. Blevins (2006: 16) rightly observes that, for instance, onsets may be simple or complex "in all varieties of Modern English that have enjoyed relatively natural histories with little change induced by external factors". Blevins (2006: 16) further notes that CR onsets and sC onsets are also "stable features of

[26] See Hall Jr. (1943: 16).
[27] As shown in Avram (2007, 2009, 2014).

Modern English" in this sense. However, these stable features of English syllable structure may become, in Blevins's (2006: 16) words, "unstable features under contact". One of the examples given by Blevins (2006: 16) is a consequence of the fact that "new varieties of English have arisen in close contact with languages that do not allow complex onsets". In such cases "changes eliminating complex onsets are in evidence, including C-deletion and V-epenthesis". As shown in 4.1, consonant deletion is not attested as a strategy for the reduction of complex onsets in Early Bislama, which only resorts to vowel epenthesis. Also, some complex onsets are allowed. Nonetheless, the Early Bislama data examined certainly confirm Blevins's (2006: 17) general conclusion that "the stability of [English] complex onsets […] is rendered unstable by intense contact or influence from languages with distinct phonotactics". Rather surprisingly, Blevins (2006) does not discuss the fate under contact of the stable feature of English "codas may be simple or complex". *Mutatis mutandis*, however, her conclusions with respect to the instability of English complex onsets also apply to English complex codas, as demonstrated by Early Bislama data.

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