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A Typology of Epenthetic Vowels in Loanwords

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1. Epenthetic Vowels

Vowel epenthesis (rather than deletion) is a common process in loanword adaptation in order to satisfy constraints on phonotactics and syllable structure in the borrowing language:

(1)	Yoruba	k**í**l**á**à**s**i	'class'
	Japanese	s**u**t**o**raik**u**	'strike'
	SeTswana	k**i**ris**i**mas**i**	'Christmas'
	Shona	g**i**rin**i**	'green'
	Samoan	s**i**kaut**i**	'scout'
	Sranan	buk**u**	'book'

While the motivation behind epenthesis as such is clear (syllable structure constraints), one question remains: Which vowel is inserted?

Previous accounts make different claims:
- The maximally unmarked, underspecified or phonetically shortest vowel is inserted via default (e.g. Pulleyblank 1988, 1998 on Yoruba; Shinohara 1997 on Japanese)
- The stem vowel is copied into the epenthesized vowel slot (e.g. Paradis 1996 on Fula)
- There is consonant-vowel assimilation, most notably labial attraction (e.g. Akinlabi 1993 on Yoruba, Batibo 1995 on SeTswana, Smith 1977 on Sranan)
- Sometimes an interplay of these factors is suggested but it is not quite clear how: Are there rival processes within one domain, or are different processes found in different domains?

Goals of this talk:
- to establish what exactly the patterns of epenthesis are by means of a statistical analysis of large loanword corpora,
- especially, to present an analysis of epenthetic vowels in Shona loanwords and in Sranan,
- to model the statistical findings in OT, using a framework of autosegmental OT,
- to show how a general typology of epenthetic vowels results from reranking constraints.

2. Case Study I: Shona

Southern Bantu language (Zimbabwe) with strict CV-syllable structure and five vowels (/i,e,a,o,u/). Analysis of a Shona-English loanword corpus (1709 items), collected from the *Shona Standard Dictionary* (Hannan 1984), Chimhundu (1983) and other sources. All 5 vowels can occur as epenthetic vowels, (2a-e) giving word-final epenthetic vowels, (f) epenthetic vowels in onset clusters:

(2a)	hendi**b**heg**i**	'handbag'	fur**u**s**i**top**i**	'full stop'
(2b)	jer**e**	'jail'	gavhumend**e**	'government'
(2c)	per**a**	'pearl'	mupak**a**	'pack of playing cards'
(2d)	t**u**rok**o**	'truck'	kand**uro**	'candle'
(2e)	parachut**u**	'parachute'	dhurop**u**	'gonorrhea discharge' < *drop*
(2f)	s**iti**recha	'stretcher'	p**u**ras**i**ta	'plaster'

Case study: Epenthetic vowels preventing Cs in coda position (for epenthetic vowels in onset clusters, see Uffmann 2001, in preparation).

1711 items in loanword corpus, coded in SPSS w.r.t. (a) the quality of the epenthetic vowel (dependent variable), (b) the quality of the preceding vowel, (c) the quality (place and manner) of the preceding consonant.

(3) A first frequency analysis

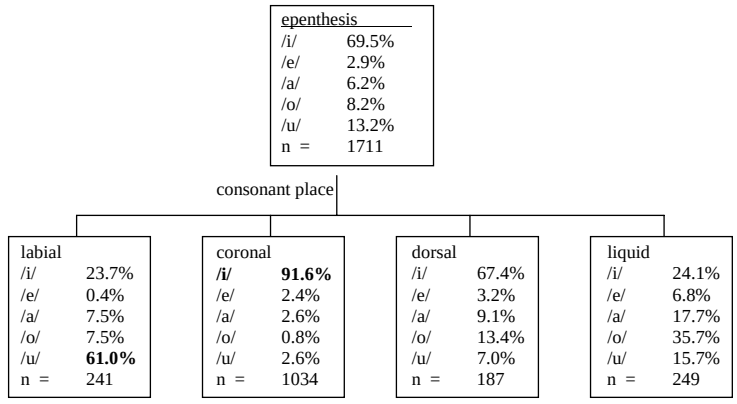
vowel	/i/	/e/	/a/	/o/	/u/	Σ
frequency	1190 69.5%	49 2.9%	106 6.2%	140 8.2%	226 13.2%	1711 100%

Is /i/, being the most frequently selected epenthetic vowel, a default vowel in Shona?

Classification trees on the basis of CHAID (chi-square automatic interaction detection) (see also Plag & Uffmann 2000).

Strongest predictor: place of articulation of preceding C

(4)

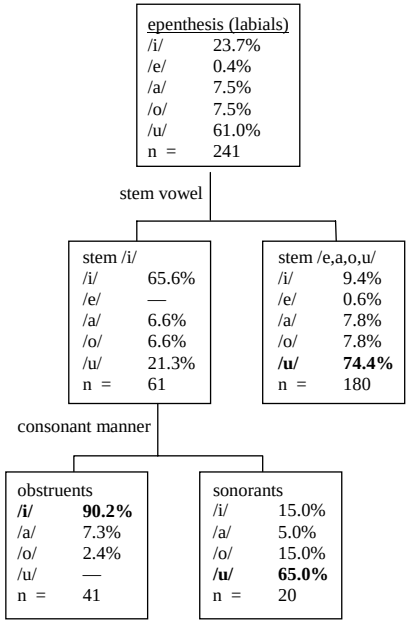


Preliminary finding: /u/ is the preferred epenthetic V after labial Cs; /i/ is preferred after coronal Cs. Not much can be said about dorsals yet.

NB: The high frequency of /i/ in the overall count is a result of the preponderance of coronal consonants in English (n=1034) after which /i/ is inserted.

Each branch of the subtree can be analyzed further: Do other variables also significantly correlate with the epenthetic vowel?

(5) Epenthetic vowels after labial consonants

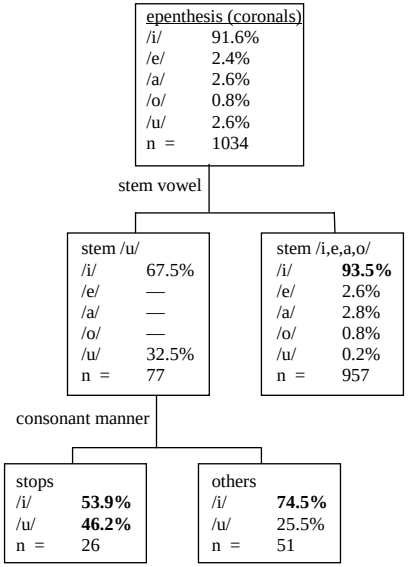


Generalization: Standard epenthetic vowel is /u/ but /i/ if /i/ and an obstruent precede

(6) Examples of epenthetic vowels after labials

(a)	timu	'team'	kirimu	'cream'
	aitemu	'item'	giramu	'gram'
	kondomu	'condom'	pefiyumu	'perfume'
(b)	hangachepfu	'handkerchief'	kirabhu	'club'
	chitofu	'stove'	chubhu	'tube'
	puruvhu	'proof'		
(c)	chipi	'sale' < *cheap*	dhibhi	'dip tank'
	kiripi	'clip'	pichipaipi	'pitch-pipe'
	bhirifi	'brief'	chifi	'chief'

(7) Epenthetic vowels after coronal consonants

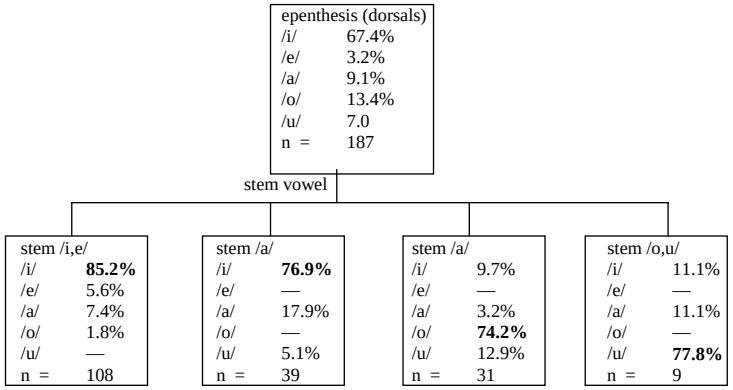


Generalization: Epenthetic vowel is /i/ but variably /i/ or /u/ if /u/ and a stop precede.

(8) Examples of epenthetic vowels after coronals

(a)	eyiti	'eight'	edzi	'AIDS'
	saradhi	'salad'	zoni	'zone'
(b)	chuni	'girlfriend' < *tune*	bhushi	'bush'
(c)	gudhu	'good'	svutu	'suit'
	bheruti	'belt'	dhauti	'doubt'

(9) Epenthetic vowels after dorsal consonants



Generalization: Epenthetic vowel is harmonic to the preceding vowel, i.e. /i/ after /i,e/, /o/ after /o/, /u/ after /u/. After /a/, there is /i/.

(10) Examples of epenthetic vowels after dorsals

(a)	hwiki	'wick'	wigi	'wig'
	cheki	'check'	kirengi	'crank'
(b)	magi	'mug'	hafubhaki	'halfback'
(d)	koko	'cork'	forogo	'fork'
(e)	bhuku	'book'	kuruku	'crook'

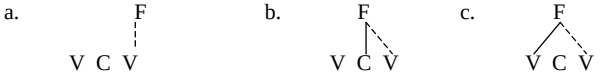
Generalization:
- after labial Cs, /u/ is inserted,
- after coronal Cs, /i/ is inserted,
- after dorsal Cs, the previous V is copied if it is /i,o,u/; after /e,a/, however, /i/ is epenthesized.
- Caveat: After stops, CV-assimilation is dispreferred; instead, we find V-copy if the previous V is /i/ or /u/.

3. Vowel Epenthesis in Autosegmental Phonology and Feature Geometry

Recap: Three possible epenthesis strategies,
- default vowel insertion
- vowel harmony
- consonantal assimilation

can be captured autosegmentally as spreading/insertion processes:

(11) Epenthesis strategies in Autosegmental Phonology



a. insertion of a default vowel (feature insertion)
b. spreading of feature from neighboring consonant
c. vowel harmony (spreading of vocalic feature)

All three processes are found in Shona, although in different domains.

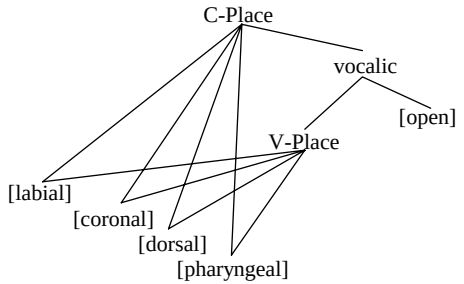
1. Preliminaries: Features and Feature Geometry

(12) Feature specification of the Shona vowel system:

	/i/	/e/	/a/	/o/	/u/
[labial]					•
[coronal]	•	•			
[dorsal]				•	
[pharyngeal]			•		
[open]		•			

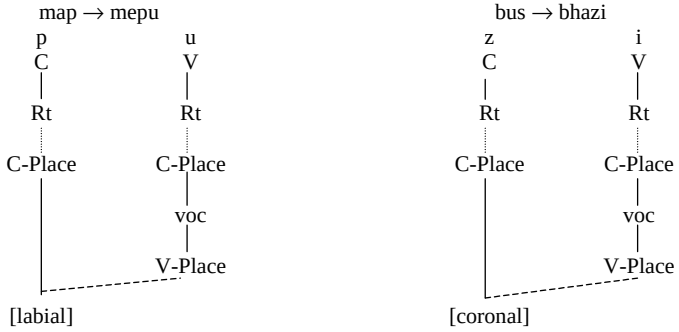
Clements/Hume model of Feature Geometry (Clements/Hume 1995, Hume 1996) as framework of choice where vowels and consonants share the same set of features (Unified Feature Theory), e.g. the geometry of place nodes:

(13) The geometry of place features (Clements/Hume 1995, Odden 1994)



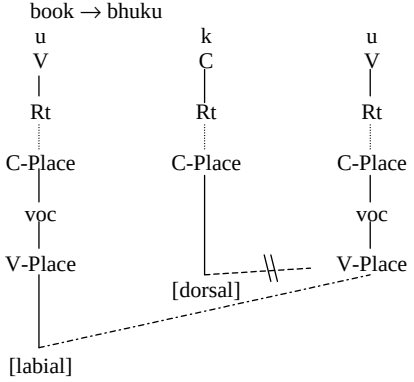
General strategy: C-spreading (if C={[labial], [coronal]}

(14)



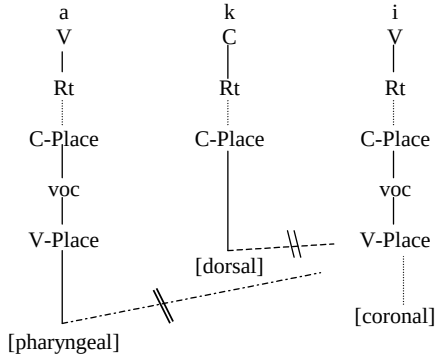
Alternative strategy I: V-spreading (if C=[dorsal] or if V=/i,u/ and C=[-son])

(15)



Alternative strategy II: If either fails, then default V insertion.
Condition: C=[dorsal] and V=[pharyngeal]

(16) clerk → kiraki



(NB. The fact that /i/ is the default vowel can be seen in the native phonology where /i/ is prosthesized to words which otherwise don't satisfy minimal word requirements)

4. Towards an OT Analysis

Epenthesis is the result of phonotactic constraints ranked differently in Shona and English. In Shona: CV syllable structure means inviolable NoCoda and *ComplexOnset constraints. Preference of epenthesis over deletion: Max » Dep.

(17) Motivating vowel epenthesis as high ranked syllable structure constraints

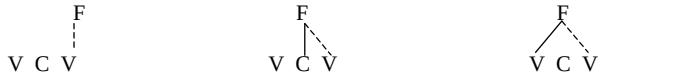
	green	NoCoda	*Complex	Max	Dep
	grin	*!	*		
	grini		*!		*
☞	girini				**
	gini			*!	*
	gi			*!*	

Which vowel is preferred? Constraints on representations

(18) Dep(F) no insertion of features
(19) *Multiple features are associated with one mother node only (no spreading)
(20) *Skip no skipping of intervening material (enforces adjacency in spreading)
(21) *Link(C,V) no association between C-Place and V-Place nodes (cf. Hume 1996)

Ranking of these constraints w.r.t. each other determines the quality of the epenthetic vowel.

(22)



Default vowel		C-spreading		V-spreading	
Dep(F)	*	Dep(F)	✓	Dep(F)	✓
*Multiple	✓	*Multiple	*	*Multiple	*
*Skip	✓	*Skip	✓	*Skip	*
*Link (C,V)	✓	*Link (C,V)	*	*Link (C,V)	✓

Note: Spreading is not enforced by Align or Agree constraints. It follows from minimal constraint violation (a 'passive' theory of assimilation and spreading), i.e. satisfaction of Dep(F).

Shona: epenthetic V receives place specifications from adjacent C

(23) mepu 'map'
saradhi 'salad'

(24) Dep(F) » *Multiple spreading is preferred to feature insertion
(25) *Skip » *Link(C,V) locality is preferred to linkage between similar segments

(26) Example tableau: team → timu

	team	Dep(F)	*Skip	*Link(CV)	*Multiple
a.	[cor] timi	*!			
b.	[cor] timi		*!		*
c. ☞	[lab] timu			*	*

Special case: dorsals don't spread
can be modeled as prohibition on dorsal Cs to spread: special case

(27) *Link(C,V) & *Dorsal local conjunction of markedness constraints

outranks *Skip, thus allowing non-local linkage.

(28)

	book	Dep(F)	*Link&*Dor	*Skip	*Link(CV)
a.	[cor] bhuki	*!			
b. ☞	[lab] bhuku			*	
c.	[dor] bhuko		*!		*

Not all vowels spread, however. If /a/ were to spread, i.e. preceding a dorsal, we find insertion of default /i/ instead. Special case

(29) *MULTIPLE (pharyngeal) no spreading of a phrayngeal node

outranks DEP(F). As both, C-spreading and V-spreading are blocked by high-ranked special case constraints, a candidate violating DEP(F) now emerges as optimal.

(30)

clerk	*MULT(a)	*LINK/DOR	DEP(F)	*SKIP	*LINK(CV)
a. ☞ [cor] \ kiraki			*		
b. [phar] ^ kiraka	*!			*	
c. [dor] \ kirako		*!			*

Further observations:
Only place features spread, not aperture features
→ high-ranked prohibition against the spreading of vocalic nodes
Across obstruents, vowel harmony can occur
→ parameterization of *SKIP constraints w.r.t. sonority
Complete rankings can be found in Uffmann (2001, in preparation)

5. Case Study II: Sranan

Sranan: creole language of Surinam. Words of English origin have paragogic (word-final epenthetic) vowels lest they end in a consonant.

CHAID analysis on the basis of Wilner (1994), *Wortubuku fu Sranan Tongo* (503 items) reveals that
- /i/ is inserted after /i,e/
- /u/ is inserted after /u,o/
- after /a/, /i/ is inserted if C=[cor], /u/ is inserted if C=[lab]

General pattern of vowel harmony (place harmony), blocked if V=/a/, then consonantal spreading.
In OT terms: Ranking of *LINK(C,V) – no CV-linkage – above *SKIP – only strictly local spreading while DEP(F) » *MULTIPLE – preference of spreading over feature insertion.

(31)

sleep	DEP(F)	*LINK(CV)	*SKIP	*MULTIPLE
a. [cor] \ sribi	*!			
b. ☞ [cor] ^ sribi			*	*
c. [lab] \ sribu		*!		*

Special case of CV-linkage following /a/ follows from special case *MULTIPLE(pharyngeal) (see above).

(32)

hot	DEP(F)	*MULT(phar)	*LINK(CV)	*SKIP
hatV	*!			
☞ hat**i**		*!		*
hat**a**			*	

6. The Development of the Sranan Pattern

Diachronically Sranan developed from default vowel system to a harmony system.

(33) Herlein (1718): /e/ is default epenthetic vowel
van Dyk (1765): system is mixed: V-harmony with coronal vowels, default insertion with labial vowels (/i,e … i/ but /u,o … e/)
Wilner (1994): vowel harmony throughout

(34)

etymon	‚look'	‚sleep'
Herlein	loeke	sliepe
van Dyk	loeke	slibi
Wilner	luku	sribi

This development can easily be explained as constraint reranking:

Herlein: default vowel is epenthesized

(35) *MULTIPLE » DEP(F)

van Dyk: /i,e/ spread, else default vowel

(36) *MULTIPLE (labial) » DEP(F) » *MULTIPLE (coronal)

Wilner: all vowels spread

(37) DEP(F) » *MULTIPLE

→ gradual demotion of *MULTIPLE

7. Towards a Typology of Epenthetic Vowels

- All three possible strategies, default V insertion, V-spreading and C-spreading are found as epenthesis strategies in loanword adaptation.
- These strategies are not only found cross-linguistically but also within one language.
- Each strategy, however, occurs in exactly defined domains.
  → Previous accounts were overly simplistic. Statistical analyses help us to unearth the real patterns.

Strategies can be described within Autosegmental Phonology and straightforwardly translated into OT constraints. Reranking these constraints generates different (attested) epenthesis patterns.

(38) *MULTIPLE » DEP(F) default vowel epenthesis
(Early Sranan, Japanese, English)

(39) DEP(F) » *MULTIPLE spreading occurs:
(a) *LINK » *SKIP vowel harmony (Sranan, Fula)
(b) *SKIP » *LINK local spreading (Shona, Samoan)

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9. Analytic Tools 🛠 (cut and paste)

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