An OT Account of Pidgin Phonolgy: Coda Consonants in Vernacular Liberian English
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1. Introduction. Two truisms of pidgin/creole (PC) genesis are that the bulk of the PC lexicon comes from the language of the socially and politically dominant group, i.e. from the **lexifier language**, and that the PC's phonology is heavily influenced by the phonology of the languages of the politically dominated peoples, i.e. from the **substrate languages**. The present study focusses on the phonology of a specific pidgin, Vernacular Liberian English (VLE). It begins by presenting an analysis of the treatment of coda consonants in VLE and then addresses the relation of the phonology of VLE to that of one of VLE's substrate languages, Loma. In doing this, I make use of Optimality Theory (OT), arguing that OT provides direct insights into the ways in which substrate languages shape PC phonology.

1.1 The Creole Continuum. In the analysis of pidgin phonology that follows, I make use of the creole-continuum model developed by David DeCamp (1971). Prior to examining pidgin phonology, it is appropriate to set out the basic principles of the continuum model and to apply them to the situation at hand. According to DeCamp, in some situations where the PC co-exists with its lexifier language, the range of speech includes not only the PC and its lexifier language but also a set of intermediate varieties. Originally, the model predicted a vast number of such varieties, but subsequent research into PC continua (Rickford 1987, Patrick 1992) shows there to be only a relatively small number of these intermediate lects.

The terminology of the creole continuum entails the **basilect** (the variety furthest from the lexifier language), the **acrolect** (the variety closest to the lexifier language), and the **mesolect** (the varieties intermediate between the basilect and the acrolect).

The continuum model has been applied most frequently to English-lexifier creoles in the Caribbean; however, Singler (1984, 1995) has shown that in Liberia the model can be applied to VLE, a pidgin.[2] While VLE developed along the Liberian coast well before the present century, it did not enter the interior of Liberia in any significant way until the early 1900's. The focus of the present study is the VLE of the interior, specifically that spoken by elderly first-language Loma speakers with no western education. Though I focus on the treatment of verbs, the constraints that are posited hold for all VLE parts of speech.

1.2 The Nature of Substratal Phonological Influence. As noted above, the substrate has long been held to play an important role in shaping PC phonology. Singler (1991) makes the point that the substrate's contribution to PC phonology lies primarily in surface structure conditions, not in phonological processes. VLE and the Mande language Loma, taken together, illustrate this

point.[3] VLE permits far fewer coda consonants on the surface than do, say, American or British English. Inasmuch as Loma permits no surface coda consonants whatsoever, Loma is an obvious source of the restrictions on coda consonants in VLE. To eliminate the coda consonants, VLE variably employs paragoge (word-final vowel epenthesis), deletion, and resyllabification. Loma makes no use of paragoge, none of resyllabification, and very little of deletion. The surface structure conditions cause VLE to look very much like Loma, but the phonological processes in VLE that achieve that end have no direct foundation in Loma phonological processes.

2. Optimality Theory. Thus, the primary locus of substratal input into PC phonology can be seen to lie in surface structure conditions, i.e. in constraints on the output. Constraints on the output are, in turn, the building blocks of Optimality Theory (OT). The present paper seeks to present an OT analysis of the treatment of coda consonants in the most basilectal variety of VLE, a variety I call the Alpha Basilect.[4] Then I will show how a second, less basilectal, more English-like variety, the Beta Basilect, differs from the Alpha Basilect. I will then compare the Alpha Basilect's phonology to that of Loma. Finally, I will see how the OT analysis of the Alpha and Beta Basilects stands up in the analysis of a corpus of recorded VLE speech.

In the OT analysis that I propose, I use the Correspondence approach to Faithfulness Constraints (McCarthy and Prince 1994, 1995). I assume DEP and MAX, but with an adjustment. Following--among others--Weinberg's (1996) work on Luiseño, I distinguish between DEP for Consonants and DEP for Vowels. (Subsequently, I propose a second adjustment.) These constraints are given in (1).

1. Faithfulness Constraints

MAX	Every segment of the input has a correspondent in the output (i.e. no phonological deletion).
DEP-C	Every consonant of the output has a correspondent in the input (i.e. no epenthetic consonants).
DEP-V	Every vowel of the output has a correspondent in the input (i.e. no epenthetic vowels).

Further, I will make use of constraints regulating syllabic well-formedness, specifically the ONSET (ONS) and NOCODA constraints listed in (2).

2. Syllabic Harmony Constraints

ONS	Syllables must have onsets.
NOCODA	Syllables are open.

Finally, VLE has a minimal word requirement. This is achieved by the proper ranking of a set of constraints involving alignment, edges, and the construction of feet. For present purposes, it suffices to employ a cover term for this set, namely MINIMAL WORD (MINWD), as set out in (3).

3. MINIMAL WORD (MINWD) [This is a cover term for the set of constraints by which the minimal size of the Prosodic Word (PrWd) is established. In the present case, a PrWd is taken to be minimally disyllabic.]

The consequence for VLE and for Loma of the cluster of constraints subsumed under MINWD is that a Prosodic Word must be minimally--though not maximally--disyllabic.[5]

2.1 The Alpha Basilect. In looking at the Alpha Basilect, the first point to be noted is that, even though MINWD requires that words be minimally disyllabic, when the input has the shape CV, other constraints (specifically DEP-C and ONS) outrank MINWD and the optimal candidate is monosyllabic, as in (4). (In (4) and subsequently, brackets are used to set off the boundaries of PrWd's. Further, a paragogic vowel in VLE is ordinarily [i] or [e], depending on the height of the vowel preceding it.)

4. /du/ 'do'

	DEP-C	ONS	MINWD-VERB	DEP-V	MAX
☞ du			*		
[du.i]		*!		*	
[du.ti]	*!			*	

On the other hand, when the input has the shape CVC, then MINWD is not violated. A candidate containing a paragogic vowel is selected as optimal. This is the case in (5), where *te.ke* emerges as the optimal candidate for /tek/.

5. /tek/ 'take'

	NOCODA	MINWD-VERB	DEP-V	MAX
☞ [te.ke]			*	
te		*!		
tek	*!	*!		

When the input is already disyllabic, as in (6), then the word-final consonant is not needed for the construction of a minimal PrWd and does not appear in the optimal output. Thus, *rɛ.spɛ* is the optimal candidate, not **rɛ.spɛ.ke*.

6. /rɛspɛk/ 'respect'

	NOCODA	MINWD-VERB	DEP-V	MAX
☞ [rɛ.spɛ]				*
[rɛ.spɛ.kɛ]			*!	
[rɛ.spɛk]	*!			
[rɛs.pɛ]	*!			*

A further point with regard to VLE verbs is that the "two-word" verbs of English, e.g. call up, put down, behave as single units in VLE. This is true syntactically, semantically, and phonologically. It is illustrated in (7), where the pronominal object obligatorily comes after the particle rather than before it as it would in English.

7. a mə tek a dɛ̃?
I must take out them
'Should I take them out?'

Consequently, it is appropriate to include both the verb and the particle within a single PrWd. Thus, *te.ka* in (7) satisfies MINWD.

Phonologically at least, object pronouns also behave as if they are part of the verb in VLE. While this would not be true in English, it is in Loma, according to Dwyer (1981). In Loma, first-and-third-person singular object pronouns consist of tones placed at the beginning of the verb; other object pronouns with segmental content are also verb prefixes.

In VLE the treatment of the object pronoun as part of the verb means that an object pronoun is part of the same PrWd as its verb. Consequently, in those cases where the final consonant of the verb can be transferred to the onset of a following pronoun or particle (either because the onset is unfilled or because a permissible onset cluster is created by the resyllabification of the coda consonant), the optimal output will reflect that resyllabification.

The question then arises as to which onset clusters are permissible and which not. In (8) I posit POSSIBLE ONSET (POSSONS), which is again not a single constraint but rather a cover term meant to encompass the constraints and rankings necessary to yield the appropriate onsets. In positing it, I assume that the principal constraint is scalar and is based on the Sonority Hierarchy. The set of possible onsets in VLE is a subset of the set of possible onsets that obtain in English.

8. POSSIBLE ONSET (POSSONS) [a cover term to encompass the constraints and rankings necessary to yield the appropriate onsets]

The way in which POSSONS affects the Alpha Basilect is seen in the tableaux in (9) and (10). In (9) the combination of verb plus object pronoun meets the

MINWD requirement; further, *tw* is a possible onset, thus yielding *gri.twi.*

9. /grit wi/ 'greet us'

	NOCODA	POSSONS	MINWD-VERB	DEP-V	MAX
☞[gri.twi]					
[gri.wi]					*!
[gri.ti.wi]				*!	
[grit.wi]	*!				

In constrast, ***tm*** is not a possible onset cluster in VLE. Accordingly, in (10) ***gri.tmi*** is ruled out. ***grit.mi*** is blocked by NOCODA, and ***gri.mi*** is the optimal candidate.

10. /grit mi/ 'greet me'

	NOCODA	POSSONS	MINWD-VERB	DEP-V	MAX
☞[gri.mi]					*
[gri.tmi]		*!			
[gri.ti.mi]				*!	
[grit.mi]	*!				

In terms of determining the optimal candidate, when the input is monosyllabic and contains a coda consonant, a paragogic vowel is going to be present in the output no matter what the coda consonant is. Similarly, in the cases when a particle or pronoun follows the verb and POSSONS is not violated, it again does not matter what the coda consonant is. However, in cases that are like (10), when the coda consonant is /p/ or /b/, the constraints and rankings cited thus far select the wrong candidate. This is illustrated in (11), where the ungrammatical ***ki.mi*** is predicted rather than the actually occurring *ki.pi.mi.*

11. /kip mi/ 'keep me'

	NOCODA	POSSONS	MINWD-VERB	DEP-V	MAX
☞ *[ki.mi]					*
[ki.pmi]		*!			
[ki.pi.mi]				*!	
[kip.mi]	*!				

In fact, the deletion of /p/ or /b/ is never permitted in the Alpha Basilect. To express this in terms of constraints, it becomes necessary to posit a specific constraint for MAX-LABSTOP in addition to the more general constraint MAX. MAX-LABSTOP is given in (12).

12. MAX-LABSTOP — Every labial stop in the input has a correspondent in the output (i.e. no deletion of a labial stop).

The permissibility of a constraint pair like MAX-LABSTOP and MAX is argued for by Kiparsky (1993, 1994), who specifies that it is allowable provided that the more specific constraint represents the marked member of an opposition.

The constraint MAX-LABSTOP is inviolable. With its inclusion in the tableau, the optimal candidate *ki.pi.mi* is now selected, as shown in (13).

13. /kip me/ 'keep me'

	MAX-LABSTOP	NOCODA	POSSONS	MINWD-VERB	DEP-V
☞[ki.pi.mi]					*
[kip.mi]		*!			
[ki.pmi]			*!		
[ki.mi]	*!				

The constraints and constraint rankings presented thus far account for verbs in the Alpha Basilect. A summary of the rankings is given in (14).

14. Constraint ranking in the Alpha Basilect
DEP-C >> ONS >> MINWD >> DEP-V >> MAX
MAX-LABSTOP, NOCODA, POSSONS >> DEP-V >> MAX

in (14) the leftmost constraints are all unviolated. Forms like /no e/, *no.e*, 'know it,' establish that DEP-C is more highly ranked than ONS.[6]

2.2 The Beta Basilect. The Beta Basilect is somewhat less basilectal than the Alpha Basilect. I will present it by showing the ways in which it differs from the Alpha Basilect.

To begin with, while paragoge obtains in the Alpha Basilect, it is highly stigmatized in VLE. In the Beta Basilect, it doesn't show up at all. Alpha Basilect *te.ke* is Beta Basilect *te*. In terms of constraints, this is achieved by specifying that DEP is undominated in the Beta Basilect (DEP-C and DEP-V having been merged).

Secondly, in the Beta Basilect the requirement that there be a Minimal Prosodic Word is no longer highly ranked. Consequently, MINWD is no longer critical. Still, coda consonants move into the onset of the following syllable only when the next word is in the same Clitic Group (Selkirk 1980, Hayes 1989). Thus, /tek + yu/ 'take you' yields *te.kyu*, but /tek + yu + pekẽ/ 'take your child' yields *te.yu.pe.kẽ*, with the coda consonant absent from the surface of the verb.

Finally, the Beta Basilect is like the Alpha Basilect in requiring that labial

stops in the input be present in the output. However, since DEP is inviolable, i.e. there can be no epenthesis, another strategy is required. Specifically, it means that coda consonants have to be permitted on the surface. As a result, whereas the Alpha Basilect has *ki.pi* 'keep,' the Beta Basilect has *kip*. Where the Alpha Basilect has *ki.pi.mi* 'keep me,' the Beta Basilect has *kip.mi*. In terms of constraint rankings, this means that NOCODA is now dominated--by DEP, by MAX-LABSTOP, and by POSSONS. The entire set of relevant constraint rankings for the Beta Basilect is presented in (15):

15. Constraint ranking in the Beta Basilect

DEP >> ONS

DEP, MAX-LABSTOP, POSSONS >> NOCODA >> MAX

DEP, MAX-LABSTOP >> MINWD

To recapitulate the differences that obtain in a comparison of the Beta Basilect (15) with the Alpha Basilect (14): in the Beta Basilect, MINWD has dropped; DEP-V has been united with DEP-C, and DEP is undominated; and NOCODA is now ranked below DEP, MAX-LABSTOP, and POSSONS.

3. VLE and Loma. At the outset, it was asserted that that substratal phonology plays a major role in shaping PC phonology. Moreover, it was claimed that this influence manifests itself in constraints on the output. In a comparison of Loma and the Alpha Basilect, as the chart in (16) shows, highly ranked constraints in Loma are highly ranked constraints in the Alpha Basilect as well. In that way, substratal influence manifests itself in the pidgin.

16. A comparison of VLE with Loma.

The VLE Constraint	Its status in Loma (Sadler 1951; Dwyer 1981)
NOCODA	Inviolable in Loma
DEP	Inviolable in Loma
MINWD	MINWD is highly ranked in Loma. The only forms that violate it are the few cases where the input is /CV/.
ONS	Violated in Loma but not frequently. All PrWd's begin with a consonant.
MAX-LABSTOP; MAX	According to Sadler (1951:314-6), a glide deletes in some environments when the vowel that follows it agrees with it for backness; a voiced velar fricative is sometimes deleted when it precedes *a*. These are the only reported violations of MAX.
POSSONS	[*COMPLEX] is highly ranked. The only permissible consonant clusters are *kw* and *gw*, and the possibility exists that they are labialized velar stops rather than true sequences of consonants.

As far as coda consonants are concerned, the ranking of two constraints in particular account for the differences between Loma and **non**-pidginized English. These are the inviolability of NOCODA and the high ranking of MINWD. In its ranking of these constraints, the Alpha Basilect is like Loma, not like non-pidginized English.

The two primary exceptions to a complete substratal explanation for the Alpha Basilect's constraint rankings involve POSSONS and MAX-LABSTOP. While POSSONS comes quite clearly from English, there is no apparent source for MAX-LABSTOP: not in English, not in Loma or in any other Liberian language, and not really in phonetics either. I have no answer for the special status of labial stops vis-à-vis MAX in VLE.

A further point involving VLE relative to Loma is that, if the two basilects are compared to each other in terms of the relationship of each to Loma, it can be seen that each change from Alpha to Beta moves the system further from Loma and closer to English.

4. The creole continuum, OT, and actual speech data. Thus far, I have set out the constraints and constraint rankings for two basilectal varieties and then linked them to a relevant substrate language. My final concern involves the continuum model, OT, and actual speech data. The question that arises is how well OT succeeds in accounting for a corpus drawn from a continuum situation.

The data on which the present study is based come from sociolinguistic interviews with seven elders carried out in 1985 by Sumoyea Guluma in his and their home town of Borkeza, Lofa County. As in Singler (1991), I took 75 verbs from each interview. Each verb was monosyllabic and had a non-nasal coda consonant in its input. The speakers and their coastal job history are given in (17); their pseudonyms reflect jobs that they have held. (Singler 1991 provides more extensive discussion of the speakers, their histories, and the sociolinguistic interviews from which the data are drawn.)

17. The speakers and their occupations.

Speaker	Rubber Tapper	Other work at Firestone	Soldier	Occupation Elsewhere
Blaster	Yes	No	No	*
Bottlepicker	Yes	No	No	**
French Soldier	Yes	Yes	No	No
PFC	No	No	Yes	No
Overseer	Yes	Yes	Yes	No
Tailor	Yes	No	No	No
Tapper	Yes	No	No	No

*Detonator at an iron ore mine

**Warehouse worker in Monrovia

A job outside the Firestone rubber plantation carries comparatively high status; on the other hand, a person whose only job on the coast was as a rubber tapper has low status. Thus, the first two speakers on the list, Blaster and Bottlepicker, hold

comparatively high status, while the last two, Tailor and Tapper, hold low status. The remaining three fall in between the two extremes. Linguistic correlation of this status assignment shows up, for example, in the treatment of aspect, as shown for these speakers in Singler (1995).

I evaluated the 75 verb tokens for each speaker to see which constraint ranking each token conformed to: Alpha but not Beta, both Alpha and Beta, Beta but not Alpha, or neither Alpha nor Beta. For example, for a word like /tek/ in (5), *te.ke* is the optimal Alpha candidate and *te* the optimal Beta one.

A tabulation of the number of forms that conform to one or the other or both of the basilects is given in (18).

18.

	Number of forms conforming to:			
	(a) Alpha Basilect	(b) both basilects	(c) Beta Basilect	n
Blaster	8	8	44	75
Bottlepicker	6	17	48	75
French Soldier	14	11	25	75
PFC	26	12	28	75
Overseer	32	12	24	75
Tailor	32	5	13	75
Tapper	40	19	7	75

Below I treat those cases that do not conform to either basilect. First, however, I wish to consider those instances where the token conforms to one or both of the basilects. In (19), I look at the extent to which a given speaker's conforming forms fit one basilect as opposed to the other.

19.

	Of those forms that conform to one or both of the rankings, percentage that conforms to the		
	Alpha Basilect	Beta Basilect	n
Blaster	27	87	60
Bottlepicker	32	92	71
French Soldier	50	72	50
PFC	58	61	66
Overseer	65	53	68
Tailor	74	36	50
Tapper	89	39	66

The Alpha figures in (19) constitute (a+b)/(a+b+c) from (18); the Beta figures are (b+c)/(a+b+c). N in (19) is a+b+c from (18).

The distribution of each of the basilects--and of the two of them taken together--directly corresponds to the job scale represented in (17). The two high-status speakers are the ones who use the Beta Basilect the most and Alpha the least. At the other end, the two low-status speakers use the Beta Basilect the least and Alpha the most. The three speakers of intermediate status fall neatly in

between. The fact that every one of the speakers uses both basilects is to be expected: a speaker controls a **range** of the continuum, not a point. What makes Tapper more basilectal in his speech than Bottlepicker is not that Tapper only uses the Alpha Basilect and Bottlepicker only the Beta Basilect. They both use both basilects; the difference between them lies in how much each uses each variety. To represent the community grammar of VLE or even the grammar of a single speaker, the kind of variation that is mapped out in (19) must be sanctioned.

At the same time, fully 94 of the 525 tokens (18%) are left out of the chart in (18) precisely because they fail to conform to either basilect. Almost all of the exceptions involve the weakening of the status of NOCODA (80/94, 85%). Thus, glottal stops sometimes show up in coda position (19 times in the corpus). Most of the time, however, a "full" consonant incurs the violation. Except for the fact that /ch/ is especially likely to surface and /l/ especially unlikely to, no distribution by consonantal property emerges. In theory, the weakening of NOCODA ought to correlate with the higher range of the continuum. That seems true for the use of glottal stops: in the mesolect, the use of a glottal stop in coda position in place of some other consonant is common. In the case of full coda consonants, however, there appears to be no particular connection between speaker's range on the continuum and the use of coda consonants in violation of NOCODA.[7]

5. Conclusion. The analysis of actual speech data presents both the "good news" that the distribution of forms lends credence to the continuum model and the "bad news" that a significant minority of the tokens fit neither of the posited basilects. Moreover, the majority of the exceptions do not conform in any regular way to speakers' range of the continuum; thus, one cannot eliminate the problem by assigning these forms either to a Gamma Basilect or an Alpha Mesolect.

These problems notwithstanding, the VLE data show that it is indeed the case that the Alpha Basilect of VLE takes its input from English and the bulk of its phonotactic principles from Loma. By using OT to analyze VLE's treatment of coda consonants, I have demonstrated OT's ability to give straightforward meaning to the two truisms expressed at the outset. Cast in OT terms, those statements can be recast in the following way: A pidgin gets its input from its lexifier language, and it gets the bulk of its constraint rankings from its substrate.

Notes

1. I am grateful to Katya Zubritskaya and An-Nah Moon for their helpful suggestions. All errors are my own. An NYU Research Challenge Fund Grant made possible the research upon which this paper is based. I am grateful to the elders of Borkeza for their willingness to be interviewed and to David Peewee, Boakai Zoludua, and especially Sumoyea Guluma for their invaluable assistance.

2. As Singler (1995) shows, the Liberian continuum does not encompass Settler English, the language of the descendants of the African Americans who had immigrated to Liberia in the nineteenth century. Instead, VLE (the language along the continuum) is a descendant of the pidgin that has been spoken on the Liberian coast since the eighteenth century if not earlier. The VLE continuum also does not include Kru Pidgin English, which has had a distinct history (Singler 1988).

3. The primary substratal languages for VLE come from the Kru and Mande branches of Niger-Congo, none of which permit coda consonants. While some of these languages permit tautosyllabic nasal consonants (Loma does not), such consonants are located in the nucleus, not the coda.

4. I owe this terminology to Renée Blake.

5. For the data under consideration in the present study, i.e. the basilectal VLE of first-language Loma speakers, MINWD is crucial in those cases where the input has the shape /CVC/. In basilectal VLE this shape, /CVC/, is limited to verbs. The reason for this is historical. VLE evolved on the Liberian coast among speakers of Kru languages. In Liberia's coastal Kru languages, NOCODA is inviolable, and there is no highly ranked MINWD requirement for PrWd. If a word from English contained a coda consonant and that consonant was never part of the optimal output in any form of the word in any environment, the input changed over time, the coda consonant disappearing from it. In the case of verbs, however, the use of the suffix *-ẽ* (< Eng. *-ing*) would have reinforced and thereby preserved the coda consonant of the stem, e.g. the stem-final *k* in *te.kẽ*, 'taking.' Pidgin was introduced on the Liberian coast 150 years or more before it made its way into the interior. Rather than being involved in the original pidginization of English in Liberia, Loma speakers would have learned VLE from the coastal speakers whose ancestors had been VLE's original architects. As such, the only words they would have learned whose input was CVC would have been verbs.

6. It should be possible to rank MAX-LABSTOP vis-à-vis NOCODA, the crucial forms being ones where the input is a disyllabic verb that ends with a labial stop, e.g. /ɛsɛp/, 'accept.' However, there is a gap in the data, and for now the ranking of the two relative to each other remains unresolved.

7. The remaining fourteen forms involve instances when resyllabification was predicted but did not occur. In eleven of the fourteen, the explanation would seem to be that the verb alone served as PrWd and paragoge resulted, e.g. /tek wi/, 'take us,' realized as *te.ki.wi* rather than *te.kwi*. This indicates that the inclusion of a pronoun in the same PrWd as the verb constitutes a tendency rather than absolute behavior.

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