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Colloquial Singapore English phonology through the lens of Optimality Theory

1 Introduction and background

English in Singapore, once seen as a neutral, foreign language with no connection to Singaporean identity, has been gradually transformed over the last two hundred years to become a nativized variety with its own unique lexicon and unique grammar. The origin of certain phonological processes unique to Singapore English is in particular difficult to trace and break down because of the influence of the multitude of other languages spoken in the area, as well as the interaction between these substrates, particularly as it was shaped through the school system. Further, Singapore English can be roughly broken down into Standard Singapore English (SSE)—an acrolectal form of Singapore English that is fairly similar to Received Pronunciation, with the exception of some phonological processes—and Colloquial Singapore English (CSE)—a mesolectal/basilectal form of Singapore English that can be unintelligible to those who speak other varieties of English.

Prior analyses of the phonology of Colloquial Singapore English (which will be the focus of this paper as well) have focused on providing documentation of the variety, in particular through rule-based formalisms. However, rule-based phonology has increasingly been disfavored in our current formal system of generative phonology. Instead, how can we represent phonological processes of CSE in an optimality theory (OT) framework, as opposed to a rule-based, purely descriptive framework? In particular, I will draw from a number of previously-attested OT constraints to describe three phonological phenomena in CSE: (1) vowel monophthongization, (2) de-syllabifying syllabic consonants, and (3) deletion of word-final obstruents. In this paper, I will be proposing a number of constraints that will be ranked accordingly in order to produce the desired outputs from our given inputs.

2 Phonological phenomenon

2.1 Vowel monophthongization

We may describe the vowel monophthongization process by the following descriptive generalization:

Two vowels may not occur consecutively (i.e. V_1V_2).

This requirement is enforced by deletion: V_2 will be deleted,

except when the V_1V_2 sequence is part of a sequence of three consecutive vowels (i.e. $V_1V_2V_3$),

in which case disallowing V_1V_2 sequences is enforced by V_2 changing from a nucleus into an onset, becoming a glide.

This generalization is supported by the following data, which compares CSE forms with SSE forms:

mek	‘makeup’	cf. SSE meɪk
don(t)	‘don’t’	cf. SSE doʊnt
kɔmpɛd	‘compared’	cf. SSE kəmpɛəd
wal	‘while’	cf. SSE waɪl
awə	‘hour’	cf. SSE aʊə
tajəd	‘tired’	cf. SSE tɑɪəd

In order to account for the vowel monophthongization phenomenon, we may posit three constraints that, when ranked correctly, will produced our desired output.

(1) MAX – Assign one violation (*) for every segment in the input that does not have a corresponding segment in the output.

(2) MAX_{V1} – Assign one violation for every V_1 in a $V_1V_2(V_3$, etc.) string that does not have a corresponding segment in the output.

(3) ONSET – Assign one violation for every syllable peak that is at the left-most edge of a syllable (i.e. syllables must have onsets).

We will then motivate the ranking $\{\text{MAX}_{V1}, \text{ONSET}\} \gg \text{MAX}$.

/$w_1a_2ɪ_3l_4$/	MAX_{V1}	ONSET	MAX
a. → $w_1a_2l_4$			*
b. $w_1a_2ɪ_3l_4$		*!W	L
c. $w_1ɪ_2l_3$	*!W		L

Tableau 1.1

The proposed ranking also accounts for the behavior of $V_1V_2V_3$ sequences, where V_2 becomes a glide. Under this ranking, V_2 becomes a glide in order to reduce the number of ONSET violations. Although [aʊə] and [a] have the same number of ONSET violations, [a] has an extra MAX violation, which knocks it out of the running for being the optimal candidate.

/$a_1ʊ_2ə_3$/	MAX_{V1}	ONSET	MAX
a. → $a_1w_2ə_3$		*	
b. $a_1ʊ_2ə_3$		**!*W	
c. $a_1ə_3$		**!W	*W
d. $u_2ə_3$	*(!)W	**(!)W	
e. a_1		*	*!*W

Tableau 1.2

Although tableau 1.2 does not provide us with any useful information for ranking constraints, it is useful in explaining the vowel/glide alternation that occurs in these vowel strings.

One problematic candidate that was not included in Tableau 1.1 was the candidate [wajl̩]. If we add [wajl̩] to the tableau of possible outputs, we see that it does not incur any violations and should emerge as the winner:

/w$_1$a$_2$ɪ$_3$l$_4$/	MAX$_{V1}$	ONSET	MAX
a. w$_1$a$_2$l$_4$			*
b. w$_1$a$_2$ɪ$_3$l$_4$		*!W	L
c. w$_1$ɪ$_3$l$_4$	*!W		L
d. →! w$_1$a$_2$j$_3$l̩$_4$			L

Tableau 1.3

In order to ensure that [wajl̩] does not emerge as the optimal candidate, we must posit another constraint that is preventing [wajl̩] from winning due to its ranking over MAX. The constraint in question, *C$_{syll}$, interacts with a number of other constraints in preventing syllabic consonants from surfacing in CSE, a phonological phenomenon that we will now address. We will return to the problematic candidate [wajl̩] after the relevant constraints have been defined.

2.2 Syllabic consonants

We may describe the treatment of syllabic consonants in Colloquial Singapore English with the following descriptive generalization[1]:

Syllabic consonants may not appear in the output.

> This requirement is enforced by epenthesis: a schwa [ə] will be inserted before the would-be syllabic consonant, making it a coda instead.

[1] Although there is tense-lax unfaithfulness for some vowels in the output, it is irrelevant for the phenomena we are discussing in this section and sebsequent sections.

Below are a number of tokens that form representative data of this phenomenon:

lɔd͡ʒikəl	'logical'	cf. SSE lɒd͡ʒɪkl̩
hinduizəm	'Hinduism'	cf. SSE hɪndʊɪzm̩
ɡivən	'given'	cf. SSE ɡɪvn̩

Based on the sonority scale as seen in Zec 2007 and reprinted in Figure 1, we may conclude based on this treatment of syllabic consonants that only vowels may occur as syllable peaks. In Singapore Standard English, as well as in other varieties of English such as those in the Inner Circle (e.g. Received Pronunciation, General American English, Australian English, etc.), the sonority requirement on syllable peaks is more lax and extends to include nasals and laterals.

Obstruents	Nasals	Laterals	Vowels
← least sonorant		most sonorant →	

Figure 1: Sonority Scale (Zec 2007)

In addition to the three constraints that we had introduced in the previous section—MAX$_{V1}$, MAX, and ONSET, we posit three additional constraints that govern the behavior of syllabic consonants in CSE.

(1) R-ANCHOR – Assign one violation (*) for if the segment on the right edge of in the input does not have a corresponding segment on the right edge of the output.

(2) DEP – Assign one violation for every segment in the output that does not have a corresponding segment in the input.

(3) *C$_{syll}$ – Assign one violation for every syllabic consonant that appears in the output.

We will motivate {*C$_{syll}$, MAX, R-ANCHOR} $\gg$ DEP.

/g$_1$ɪ$_2$v$_3$n̩$_4$/	*C$_{syll}$	MAX	R-ANCHOR	DEP
a. → g$_1$i$_2$v$_3$ə$_5$n$_4$				*
b. g$_1$ɪ$_2$v$_3$n̩$_4$	*!W			L
c. g$_1$ɪ$_2$v$_3$		*(!)W	*(!)W	L
d. g$_1$ɪ$_2$v$_3$n$_4$ə$_5$			*!W	*

Tableau 2.1

If we return to the previously problematic candidate [wajl̩], we see that we may now rank *C$_{syll}$, when ranked above MAX, is capable of knocking out the problematic candidate [wajl̩]:

/w$_1$a$_2$ɪ$_3$l$_4$/	MAX$_{V1}$	ONSET	*C$_{syll}$	MAX
a. → w$_1$a$_2$l$_4$				*
b. w$_1$a$_2$ɪ$_3$l$_4$		*!W		L
c. w$_1$ɪ$_3$l$_4$	*!W			L
d. w$_1$a$_2$j$_3$l̩$_4$			*!W	L

Tableau 2.2

Our new ranking, given tableau 2.2, is either {*C$_{syll}$, R-ANCHOR} ≫ MAX ≫ DEP or *C$_{syll}$ ≫ {MAX, R-ANCHOR} ≫ DEP. Given that R-ANCHOR is never violated in an optimal candidate, it is impossible to determine the exact ranking of R-ANCHOR without further evidence.

Furthermore, if we posit that R-ANCHOR exists, we may posit that a similar constraint, L-ANCHOR, also exists, which we may define as such:

(1) L-ANCHOR – Assign one violation (*) for if the segment on the left edge of in the input does not have a corresponding segment on the left edge of the output.

If we return to the token /aʊə/ from the previous example, the constraint L-ANCHOR provides an explanation as to why the optimal candidate still has a violation for ONSET, rather than epenthesizing an onset when we have seen that DEP is ranked very low—that is, L-ANCHOR prevents the epenthesis of an onset on the left edge of the prosodic word.

/$a_1ʊ_2ə_3$/	MAX_{V1}	L-ANCHOR	ONSET	MAX	DEP
a. → $a_1w_2ə_3$			*		
b. $a_1ʊ_2ə_3$			**!*W		
c. $a_1ə_3$			**!W	*W	
d. $u_2ə_3$			*(!)W	**(!)W	
e. a_1			*	*!*W	
f. $w_4a_1w_2ə_3$		*!W	L		*

Tableau 2.3

A Hasse diagram for the seven constraints that have been defined and ranked so far is as follows:

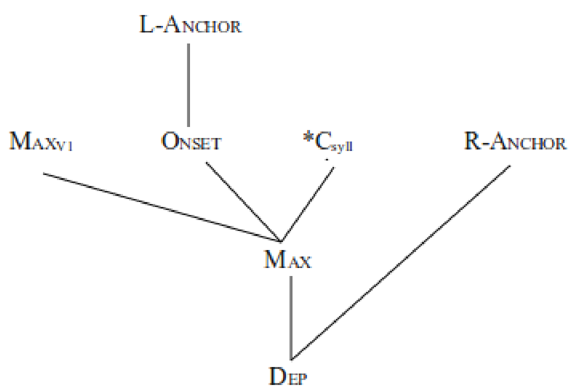

Figure 2

2.3 Word-final obstruents

We may describe the final phenomenon that we will be examining in this paper with the following descriptive generalization[2]:

Words cannot end in obstruents (segments that are [+cons, –son]).

[2]In the following descriptions and constraints, we follow Gussenhoven & Jakobs' (2005: 60) feature theory definitions that state that the glottal stop [ʔ] and that [h] are both [–cons] due to the fact that their constrictions do not occur in the vocal tract. Both segments have the feature combination [–cons, –son].

This requirement is enforced by change of the consonantal feature: [+cons] segments change their feature value to become [–cons].

Additionally, the [–cons, –son, +cont] segment [h] may not appear word-finally.

This requirement is enforced by deletion.

This phenomenon is attested by the following representative data:

fai	‘five’	cf. SSE faɪv
wi	‘with’	cf. SSE wiθ
ʃɔʔ	‘shop’	cf. SSE ʃɔp
waʔ	‘what’	cf. SSE wʌt
puʔ	‘put’	cf. SSE pʌt
bɛʔ	‘back’	cf. SSE bæk
lɔʔ	‘lot’	cf. SSE lɔt

In order to account for the behavior, four additional constraints are required:

(1) $*obs_{]PWD}$ – Assign one violation for the existence of [+cons, –son] segments to the right edge of a prosodic word.

(2) $*h_{]PWD}$ – Assign one violation for the existence of a [–cons, –son, +cont] ([h]) at the right edge of a prosodic word.

(3) IDENT(cons) – Assign one violation for every pair of corresponding input and output segments that do not match in feature [±cons].

(4) IDENT(cont) – Assign one violation for every pair of corresponding input and output segments that do not match in the feature [±cont].

In order to account for the behavior of word-final obstruents, we will motivate the ranking {IDENT(cont), $*h_{]PWD}$, $*obs_{]PWD}$} ≫ R-ANCHOR ≫ MAX ≫ {DEP, IDENT(cons)}. We saw in previous sections that R-ANCHOR ≫ MAX and that MAX ≫ DEP.

We see that this ranking holds in accounting for the deletion of word-final fricatives, rather than either (a) changing them into the [–cons, –son] fricative [h], or (b) changing them into the [–cons, –son] stop [ʔ].

$/f_1a_2ɪ_3v_4/$	IDENT(cont)	$*h_{]PWD}$	$*obs_{]PWD}$	R-ANCHOR	MAX	DEP	IDENT(cons)
a. → $f_1a_2i_3$				*	*		
b. $f_1a_2i_3v_4$			*!W	L	L		
c. $f_1a_2i_3h_4$		*!W		L	L		*W
d. $f_1a_2i_3ʔ_4$	*!W			L	L		*W

Tableau 3.1

We also see that this ranking holds for the replacement of word-final obstruents with glottal stops:

$/n_1ɔ_2t_3/$	IDENT(cont)	$*h_{]PWD}$	$*obs_{]PWD}$	R-ANCHOR	MAX	DEP	IDENT(cons)
a. → $n_1ɔ_2ʔ_3$							*
b. $n_1ɔ_2t_3$			*!W				L
c. $n_1ɔ_2$				*!W	*W		L
d. $n_1ɔ_2t_3ə_4$				*!W		*W	L

Tableau 3.2

2.4 Final summary of constraints

Using the constraints that we have motivated previously, our final Hasse diagram of constraints is as follows:

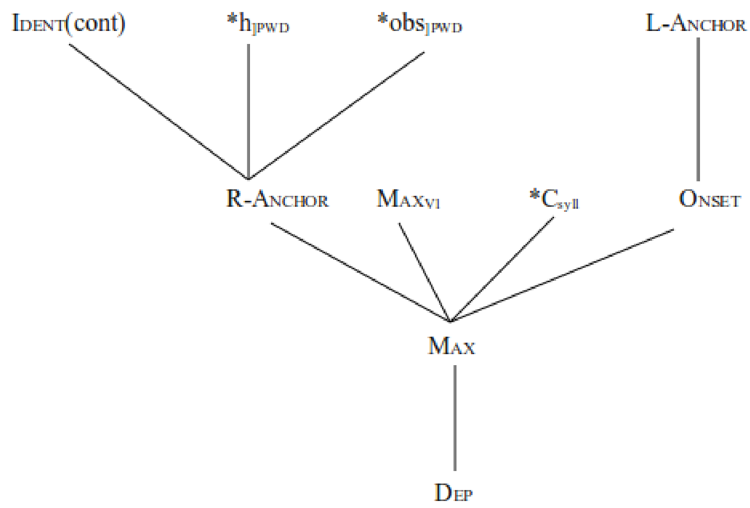

Figure 3

3 Problems and future research

This research has been limited by the amount of data that could be accessed—most phonological accounts of CSE include only scant tokens and do not provide large data sets that would possibly allow for more constraint rankings. There are some online databases that include recordings of spoken CSE; however, due to the time constraint of this project, it was not possible to go through the recordings to acquire more tokens, as the recordings did not have transcripts and would therefore need a substantial amount of time to go through looking for very specific tokens.

There are also numerous complications that arise from variation that occurs within CSE. For instance, word-final obstruents may also be deleted, rather than changed into glottal stops, and this behavior appears to occur in free variation rather than in any complementary distribution; further, speakers may use both varieties, rather than just sticking to one. We may be able to account for this phenomenon through ideas posed in Kawahara (2008), which suggests that variation may be accounted for by having certain constraints be open to ranking changes. That is, some constraints may remain unranked until an actual output is called for, allowing for reordering of the constraints and therefore variation. This process may be occurring with CSE speakers.

Additionally, one candidate was left out of Tableau 1.1 in the discussion of how to treat diphthongs in the token /waɪl/. The candidate [wajəl] presents a problem. DEP, the only constraint that this candidate violates is ranked very low, yet it is not the optimal candidate. However, given the lack of data, it is unclear as to whether or not this form occurs in free variation, as [wajəl] and [wal] do occur in free variation in other varieties of English. If [wajəl] does not occur, then another, high-ranking constraint must be posited.

4 Conclusion

Using optimality theory, we were able to account for three phonological phenomena in Colloquial Singapore English. We proposed the rankings IDENT(cont), $*h_{]PWD}$, $*obs_{]PWD}$, R-ANCHOR, L-ANCHOR, MAX, MAX_{V1}, DEP, ONSET, and $*C_{syll}$, the final ranking of which proves to be very complex and is diagrammed in Figure 3. Further work will need to be done in order to account for the high amounts of variation that occur within CSE, as well as to address problematic candidates.

5 References

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