

A Constraint -Based Approach to the Phonology of English Accents

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ABSTRACT

Optimality Theory may or may not prove to be an ideal way of describing differences between and among languages, but it provides a natural framework for describing such differences with respect to accents of English, which often show the same phonological constraints but to different degrees. This paper describes and criticises the OT approach to variation and presents an OT-type description of glottal stopping of /t/ in three accents: Standard Southern British, Midlands, and Durham.

1. INTRODUCTION

Optimality theory claims that there are certain universal constraints which are the raw material for phonologies of all languages. They incorporate notions of statistical frequency: in general, the more common a phonological process is, the more powerful. Power is expressed in terms of ranking ... while all constraints are violable, higher-ranked constraints are less violable than lower-ranked ones. "No Voicing in Final Obstruents," for example, is ranked highly in most languages. Languages (or accents) have different phonologies because rankings are different from language to language.

OT suggests that there is a language-independent device which generates all possible pronunciation candidates for a lexical item. The language-specific phonological grid (in which the ranking of the constraints is listed) filters out all candidates but one, the output.

2. Variation

The major problem in using OT for casual speech phonology is that while variation **across** accents can be described, variation **within** an accent is (at first glance) impossible to describe because there is a single mapping between the lexical input and the phonetic output. The ranked constraints determine which of the input forms is the winner, and there is only one winner.

Kager [1] suggests two possible solutions: 1) variants are the result of different phonologies, such that Variant A is generated by Grid A while Variant B is generated by Grid B. In his words, "...an input can be fed into two parallel co-phonologies, giving two outputs." (p.405) This, he admits, is a ponderous solution to a simple problem. Nathan [2] suggests that these co-phonologies may be styles, such that different speech styles have different phonologies. 2) variants are caused by variable ranking of constraints, such that two constraints can be ranked AB on one occasion and BA on another. In his words, "Evaluation of the candidate set is split into two subhierarchies, each of which selects an optimal candidate." This is known as *free ranking* (Prince and Smolensky, [3]).

Kager joins Guy [4] in preferring the second option, Guy because Occams Razor argues against such a general duplication of constructs, Kager because it links the amount of "free variation" in the (single) grammar with the number of free-ranked constraints. In the multiphonology option, there is no necessary connection between the two (or more) grammars needed to generate two or more outputs from the same input.

In agreement with Anttila [5], Kager also points out that the notion of *preferred vs unpreferred ranking* allows us the possibility of predicting which of the two outputs will be more frequent. This is a major improvement over the optional rule of generative phonology, which we assume to have applied randomly. However, it is otherwise identical to the optional rule. Nathan [2] points out yet another problem: there may be three, four, or even more casual speech outputs from the same input, which makes adequate constraint ranking a very complex business.

Boersma [6] carries constraint ranking further in proposing an OT grammar in which constraints are ranked probabilistically rather than absolutely. Kager (p.407) sums up this approach: "Fine-tuning of free variation may be achieved by associating a freely-

ranked constraint with a numerical index indicating its relative strength with respect to all other constraints. This may pave the way to a probabilistic view of constraint interaction." Boersma claims (p.330) that the flexibility offered by such a grammar can shed light on the acquisition of phonology by children and the ability to understand unfamiliar accents in adults: listeners learn to match the degree of optionality of their language environment.

3. Glottal Stopping in a Modified OT Framework

In an OT framework, we have a principled way to represent the fact that different accents of English share casual speech features but differ in the extent to which these features appear on the surface. Standard Southern British, for example, normally allows glottal stopping of /t/ only in syllable-final position when followed by a consonant or silence. Some accents allow it intervocally. Surface forms (such as ['bʌʔə] for 'butter') are thus included in Cockney and some English Midland accents. We could say this is because they rank "Lose Oral Closure for /t/" before "Unstressed Onset Faithfulness" (adherence to the lexical form at the beginning of unstressed syllables).

Kerswill (personal communication, 2001) reports that there is an accent in Durham (northern England) in which sequences such as [sevŋ'ʔaɪmz] "seven times" are legal. T-glottalling could thus be said to outrank both Stressed and Unstressed Onset Faithfulness in this accent. There are undoubtedly other accents which constrain the process in yet other ways.

Following is a proposed phonological grid in the style of Optimality Theory. I say 'in the style of OT' because the grid has been modified to allow for variation (so a ⊙ appears when more than one pronunciation is possible). A question mark (?) indicates that a form is possible but not preferred, and an exclamation mark (!) shows that a form is highly disfavoured in this accent. Otherwise, the forms listed are acceptable.

'Faithfulness' means that the output matches the input. I assume here that the constraint which preserves the citation form at the beginning of stressed syllables is different from the one which performs a similar function for unstressed syllables: we assume that stressed onsets have a special status.

Moving down from the top of Figure 1 (SSB) to the bottom (Durham), we see that as faithfulness to the lexical form becomes less constraining, glottal-stopping occurs in more environments, and variability becomes greater because the 'faithful' pronunciation remains a possibility.

a. STANDARD SOUTHERN BRITISH				
Stressed Onset Faithfulness	Unstressed Onset Faithfulness	Lose Oral Closure	Other	
"seven times"				
sevŋ'taɪmz		!	sevŋ'ʔaɪmz	
"butter"				
'bʌtə			ʔ'bʌʔə	
"cat"				
			⊙kæʔ	⊙kæt

b. MIDLANDS				
Stressed Onset Faithfulness	Lose Oral Closure /t/	Unstressed Onset Faithfulness	Other	
"seven times"				
sevŋ'taɪmz	!	sevŋ'ʔaɪmz		
"butter"				
	⊙'bʌʔə	⊙'bʌtə		
"cat"				
	⊙kæʔ			⊙kæt

c. DURHAM				
Lose Oral Closure /t/	Stressed Onset Faithfulness	Unstressed Onset Faithfulness	Other	
"seven times"				
⊙sevŋ'ʔaɪmz	⊙sevŋ'taɪmz			
"butter"				
	⊙'bʌʔə	⊙'bʌtə		
"cat"				
	⊙kæʔ			⊙kæt

Figure 1: a. **SSB**, 'Seven times, butter, cat'
 b. **Cockney, Midlands**, same words
 c. **Durham**, same words

Other casual speech processes such as tapping also lend themselves to description in an OT framework. Hammond [7] describes some aspects of schwa absorption using OT.

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