LINKING-*r* IN EASTERN MASSACHUSETTS AND OPTIMALITY THEORY

Ellen Bernard, Curtis Andrus, and Arto Anttila
Stanford University

In Optimality Theory, variation is usually derived from multiple constraint rankings (Multiple Grammars, Kiparsky 1993; Floating Constraints, Nagy and Reynolds 1997; Partially Ordered Grammars, Anttila 1997; Stochastic OT, Boersma and Hayes 2001). All these models involve multiple rankings where the number of rankings predicting an output is proportional to the frequency of occurrence of that output. These models can describe variable data with great accuracy, but they face an explanatory question: what do they exclude? Do they make general predictions about possible and impossible quantitative patterns?

　　We illustrate the challenge from linking-*r* deletion where an etymological *r* is deleted in the syllable coda, e.g. *He put the tuner* [tuwnə] *down*. The generalization is that linking-*r* tends to be preserved before a vowel where it can be parsed as an onset and deleted before a consonant where it must be parsed as a coda, depending on stress and vowel quality (McCarthy 1993, Bernard 2007). We examined two data sets from Eastern Massachusetts English: President John F. Kennedy's nomination acceptance speech, July 15, 1960 (JFK, 652 tokens) and interview data collected in Boston in July 2005 by several interviewers as part of a sociolinguistics course (BOS, 2,438 tokens). The absolute numbers vary, but the same implicational hierarchy emerges in both data sets.

(1)　　　The *r*-retention hierarchy

		JFK	BOS	
(a)	V_V, word-medially	100%	98%	*Américan*
(b)	_ C, primary stress, after central vowel	100%	79%	*búrdensome, prefér that*
(c)	V_V, word-finally	99%	76%	*pówer is*
(d)	_ C, primary stress, after non-central vowel	31%	63%	*párty, yóur help*
(e)	_ C, no primary stress, after noncentral vowel	28%	33%	*óurselves, your cities*
(f)	_ C, no primary stress, after central vowel	9%	30%	*póverty, were bóld*

We posited 6 violable constraints: MAX 'No deletion', ONSET 'Have an onset', *CODA 'No coda', *CODA/NONPRIMARY 'No coda in non-primary-stressed syllables'. *CODA/UNSTRESSED 'No coda in unstressed syllables', and ALIGN-LEFT-WORD 'No resyllabification across word boundaries'. We computed the predicted dialect typology by considering all the 720 possible rankings using OTSOFT (Hayes, Tesar, and Zuraw 2003). Two observations emerged. First, the typology reveals several implicational universals that are independent of ranking. These universals are of the form "If *r* is retained in environment E_1 it is retained in environment E_2". The following implications among *r*-retention environments are predicted: (f) → (e) → (d) → (a), (b), and (c) → (a), (b). Second, since the implicational universals are preserved by every ranking, and variation results from combining rankings, it follows that implicational universals should emerge quantitatively in variation. This is confirmed by both data sets in (1). We verified these predictions using a (freely available) Windows program that finds the implicational universals hidden in an optimality-theoretic grammar and visualizes them as a directed graph (Anttila and Andrus 2006). We conclude that Optimality Theory imposes strict limits on possible quantitative variation patterns, given a set of grammatical constraints, and that these limits emerge in the quantitative patterning of linking-*r* in Eastern Massachusetts English.