Phonetically driven faithfulness in Shona?
due Friday, Feb. 24

Data all from Uffmann 2007.

Shona has 5 vowels: /a,e,i,o,u/, and the following consonant inventory (Uffmann, p. 46):

	labials	*alveolars*	*labio-alveolars*	*post-alveolars*	*velars (& 1 glottal)*
stops	p b̤	t d̤			k g̈
implosives	ɓ	ɗ			
affricates	pf bv̤	ts dz̤	tɸ͡s dβ͡z̤	tʃ dʒ̤	
nasals	m m̤	n n̤		ɲ ɲ̈	ŋ ŋ̈
prenasalized stops	mb mb̤	nd nd̤		ndʒ	ŋg
fricatives	f v̤	s z̤	ɸ͡s β͡z̤	ʃ ʒ̈	ɦ̤
prenasalized fricatives	mv	nz	nβ͡z		
liquids		r r̤			
glides	w ʋ			j	

Shona requires every consonant to be following by a vowel (or sometimes [w]), leading to lots of epenthesis. Uffmann analyzes epenthetic vowel quality as predictable from other factors. Here are the rates that he found. Categories are grouped together (/i,e,a,o/), if there was no difference between the sub-categories.

Vowels inserted C__#

preceding V	**preceding C**	**# of i inserted**	**# e**	**# a**	**# o**	**# u**	**total**	**example**
i	labial	40	0	4	4	13	61	tim**u** 'team'
e,a,o,u	labial	17	1	14	14	134	180	tʃitof**u** 'stove'
u	coronal (=alv. or post-alv)	52	0	0	0	25	77	b̤uʃ**i** 'bush'
i,e,a,o	coronal	895	25	27	8	2	957	ejit**i** 'eight'
i,e	dorsal	92	6	8	2	0	108	hwik**i** 'wick'
a	dorsal	30	0	7	0	2	39	mag̈**i** 'mug'
o	dorsal	3	0	1	23	4	31	kok**o** 'cork'
u	dorsal	1	0	1	0	7	9	b̤uuk**u** 'book'
i	liquid	22	0	6	5	2	35	v̤ir**i** 'wheel'
e	liquid	15	12	22	19	0	68	v̤er**i** 'veil'
a	liquid	21	4	8	0	8	41	minarar**i** 'mineral'
o	liquid	1	0	4	44	0	49	hor**o** 'hall'
u	liquid	1	1	4	21	29	56	fur**u** 'fool'

Vowels inserted C__C

preceding C	following C	foll. V	# of i inserted	# e	# a	# o	# u	total	example
anything	obstruent or nasal	anything	129	0	0	0	0	129	s**i**peja 'spare'
labial	liquid	i	20	0	1	0	13	34	f**i**ridʒ̈i 'fridge'
labial	liquid	o	0	0	0	6	12	18	p**o**rofiti ~ p**u**rofiti 'profit'
labial	liquid	e,a,u	1	0	0	0	86	87	p**u**reʃa 'pressure'
coronal	liquid	anything	43	1	1	1	11	57	d̤**i**riŋgi 'drink'
dorsal	liquid	i,e,a	51	0	1	0	0	52	g̈**i**rini 'green'
dorsal	liquid	o	9	0	0	6	0	15	g̈**i**rov̤u ~ g̈**o**rov̤u 'glove'
dorsal	liquid	u	0	0	0	0	3	3	g̈**u**ruu 'glue'

1. Devise DEP-V constraints of varying levels of specificity to capture these patterns. E.g., DEP-i, DEP-i/[labial]__, DEP-i/[+round][labial]__, DEP-i/[+round]__, etc. You'll have quite a lot of constraints.
2. Construct an OTSoft input file with your constraints for each of the 21 cases above; each should have 5 output candidates. But this time you must save your OTSoft input file as tab-separate text (.txt), not Excel (.xls).
3. Instead of OTSoft, you'll be using the Wilson/George/Hayes MaxEnt Grammar Tool. Download it from http://www.linguistics.ucla.edu/people/hayes/MaxentGrammarTool/
4. First try just running the tool (the .jar file) with your OTSoft input file. By default, the learner has basically no smoothing term (i.e., huge σ), so it will devise weights that fit the data closely. If the fit to the data is poor, consider adding more DEP constraints.
5. Report the resulting weights and discuss any places where the fit to the data isn't close. Assuming that the weights assigned to the constraints reflect the Steriadean p-map, discuss what that p-map must look like and whether it seems reasonable.
6. Now you're going to play with penalizing constraints for being complex. To do so, you'll need to make a file modeled after SampleConstraintFile.txt in the MaxentGrammarTool folder that you downloaded. Each line is for one constraint; it has the constraint name, the constraint's value of μ, and the constraint's value of σ. μ is the constraint's "preferred" weight (zero by default); σ (huge by default) determines how willing the constraint is to depart from that preferred weight. A smaller value of σ means the constraint requires more evidence to depart from its preferred weight.
7. Play around with different σ values for the constraints to implement the idea of favoring simplicity.
8. Choose one version of this to discuss, as in step 5. Discuss the differences between your step-5 grammar and your grammar that employs meaningful σs.