Registrogenesis in Bunong: The Interaction of Phonetics and Phonology

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Register: A phonological system in which a historical voicing contrast on consonants is synchronically manifested on vowels.
Registrogenesis: A process by which a register system emerges.

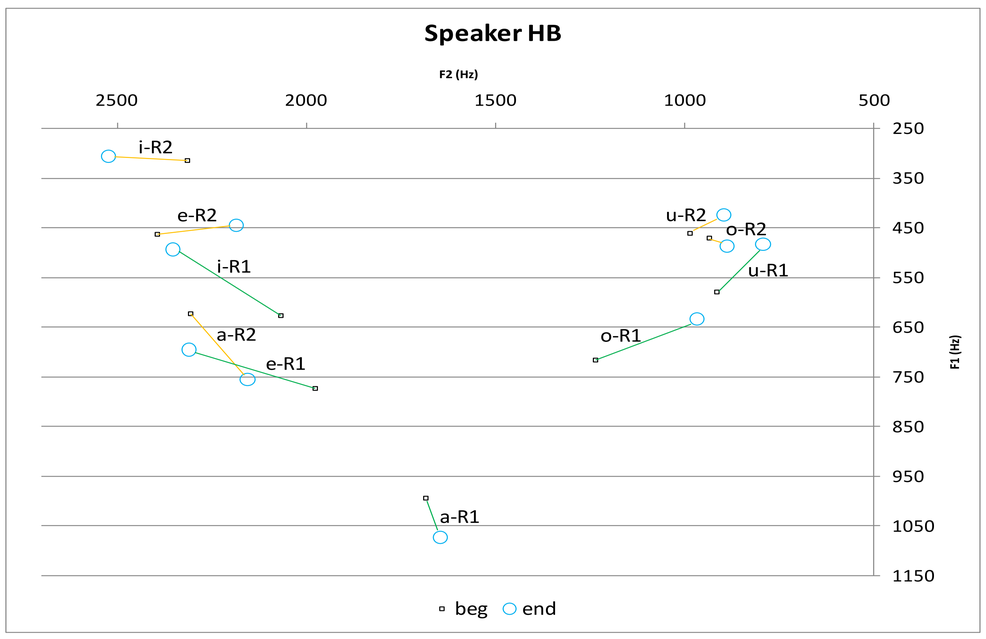
	Khmer (Henderson 1952)	Mon (Huffman 1976)	Alak (Huffman 1976)	Tibetan (Ikier, in progress)
R1: /*pa/ →	[pạ]	[pa]	[pa]	[pá]
R2: /*ba/ →	[pạ̤]	[pa̤]	[pha]	[pà]
	height	phonation	aspiration	tone

Register in **Bunong** (Mon-Khmer)
-many synchronic phonetic correlates
-sometimes unexpected patterns
e.g. /*pa/ → [pà] and /*ba/ → [pá]

Experiment 1:
What is the phonetic manifestation of register in Bunong?

	Non-low Vowels		Low Vowels	
	R1: *C[-voi]	R2: *C[voi]	R1: *C[-voi]	R2: *C[voi]
V Height	low	high	low	high
V Quality	diphthong	monophthong	monophthong	diphthong
VOT	short	long	short	long
Pitch	low	high	?	?
Phonation	modal	breathy	modal	breathy

Stimuli: 6 consonants /*p *b *t *d *k *g/, 10 vowels /i e ɛ ɨ ə a u o ɔ/



Mixed model (ANOVA, Predictors= Cues, Speaker and Gender)

	Significant predictor of Register at p=0.05?					
	Hi		Mid		Low	
	Main Effect	Reg x Gender	Main Effect	Reg x Gender	Main Effect	Reg x Gender
VOT	✓		✓		✓	
Pitch	✓	✓		✓	✓	✓
Voice Quality						
H1-H2	✓	✓		✓	✓	
F1 Bandwidth	✓	✓	✓		✓	✓
Harmonics to Noise Ratio (HNR)	✓		✓	✓		✓

Highly Significant	Barely Significant	Not Significant
✓	✓	

Experiment 2:
Which cues are most perceptible to listeners?

Stimuli:
3 cross-spliced minimal pairs: [$C_{R2}V_{R1}$] and [$C_{R1}V_{R2}$]
(i) Natural (ii) VOT altered (iii) Pitch altered (iv) VOT & Pitch altered

Forced Choice Task:
-R1 or R2 (represented orthographically)
-Goodness rating (1-7)

Results:
-Vowel height and diphthongization are most salient cues

-Goodness ratings lower when pitch, VOT don't match vowel quality

-Judgments more consistent on low vowel than non-low vowels
→ pitch and VOT probably more important for categorical discrimination in the non-low vowels

Phonologization of Registrogenesis (Hyman 1976)

Intrinsic Cues:
-Pitch is higher on higher vowels
-Vowels are higher following voiced stops

Registrogenesis:
Step 1.
Voicing raises vowels (R2)

Step 2.
-Low vowel diphthongizes following voiced stops due to F1 lowering
-Vowel quality determines register on low vowels
-Non-low vowel categories conflate

Step 3.
-Result: non-low vowels diphthongize following voiceless stops
-Result: pitch contrast is enhanced on non-low vowels
-Result: phonation contrast emerges on non-low vowels
-Vowel quality, pitch and phonation determine register on non-low vowels

Conclusions

-[register] in Bunong and has various phonetic correlates
-Cues differ by vowel height
-Vowel quality is most salient, but phonation, pitch, VOT also important
-The perceived phonetic inconsistency of [register] can be understood through its diachronic evolution

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References

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