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「通言語的観点からみた音声類型論」2022年度第3回研究会(通算第6回目)

日時:2023 年 2 月 20 日(土) 9:30-12:00 場所:オンライン会議室 使用言語:英語 主催:AA 研基幹研究「アジア・アフリカの言語動態の記述と記録:アジア・アフリカに生 きる人々の言語・文化への深い理解を目指して」(DDDLing)

報告タイトル

1 内原洋人(AA 研共同研究員,東京外国語大学)

"Cherokee S-preaspiration at the phonetics-phonology interface"

2. Jeremy Perkins (AA 研共同研究員, 会津大学), 李勝勲 (AA 研共同研究員, 国際基督教大学), 倉部慶太 (AA 研所員)

"Phonetic typology of fricatives: data from JIPA illustrations"

3. 全体討論

以下は各人によるハンドアウトです。











2. PECULIARITY OF CH 2.1. PHONETIC CHARAC	EROI TER	KEE /S/ Istics	
 Preaspirated when preceded by a short V (Feeling 1975: x) Ø→h/V_s 	(2.18)	nisdi:we?a [nihsdi:we?á] nistiiwe?a ni-stii-we?-a	
 Unlike other obstruents which are realized as voiced (when not followed by an /h/), /s/ not realized as voiced [z] 	(2.6) a. # V	PART-2DU-Say:PRS-IND 'You two are saying it.'	
 Saisa [saisa] guose Free variation with [h] in all positions (Scancarelli 2005: 363) séi.hnv ~ héi.hnv 'but' 	b. #_V	toos(a) ⁷ 'mosquito' gok [gox ^b] kook(i) 'summer'	(JRS, Ar
 Place of articulation: not contrastive with the postalveolar dà:lâ:su:hlv\$ga 'he is putting on shoes; he is 	c. V_V d. V_V	ada [adā] ata 'wood' iga [igā] jāka	(JRS, A
sung (hm)'	e. C_	'day' sgöchi [sgöchí] skoóhi 'ten'	(JRS, /

C.C. DISIRIDUIN	UN					
The only consonant which	TABLE 1.	3. Cherokee Syll	abary			
has a 'syllabary' as a		a	e	i	0	
segment	V	D a	Rc	Ti	<u>ð</u> o	O,
	g/k	∳ga Øka	₽ ge	У gi	A go	Jg
	h	o∛ ha	P he	J∂ hi	F ho	Γh
	1	W la	δle	P li	G lo	Ml
	m	o∿ ma	Ol me	H mi	5 mo	Уn
	n	θ na, t hna, G na	h 1 ne	h ni	Z no	Q n
	gw	I gwa	60 gwe	° gwi	∛° gwo	ω
	s	⊎sa (o∂s)	4 se	b si	∯ so	° s
	d/t	L da W ta	S de To te	J di J ti	Λ do	S d
	dl	& dla L tla	L dle	C dli	of dlo	P
	j	G ja	V je	hr ji	K jo	đj
	w	G wa	&9 we	Ø wi	Ø wo	9 w
	v	(S) va	\$ ve	, b vi	fi vo	G























Ø-alihkhootht-ih-a 3sg.a-shatter-prs-ind 'he is shattering it'

'I am shattering it'



- /hs/ vs /s/ cannot be contrastive
- Even though phonetically [s] is preaspirated (preceded by an [h]) when the preceding vowel is short.

t. Formulation with pre-s /h/

VsX

 H-grade
 Glottal grade

 VhV
 V?V

 VhC (C includes /s/)
 VVC

ÙÙsX

3. BEHAVIOR	0F	CHEROKEE	/\$/
3.3. SUMMARY	ľ		

Cherokee /s/-preaspiration: phonetics or phonology?

Diagnositcs (cf. Bennett et al. 2022)

 Most indicate that it is a phonological process, although this is an automatic, nonneutralizing process (typical of a phonetic process)

	Phonological	Phonetic	/s/-preaspiration	
Show physical gradience	No	Yes	Maybe	
Dependent on speech rate	No	Yes	Maybe	
Sensitive to morphological structure	yes	Possibly, but only gradiently	Yes (Laryngeal Alternation)	
Sensitive to phonotactic restrictions	yes	no	Yes (not after a long vowel, etc.)	
Feed/bleed phonological processes	Yes	No	Yes (Vowel Deletion)	
Sensitive to abstract prosodic structure (e.g. metrical feet)	yes	Yes, but only gradiently	N/A	
				$\left(\right)$

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[VhsX]

[ÙÙsX]

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Introduction & Background – Korean (2)

- Main Goals in an Acoustic Analysis:
 - (1) To assess which cues could be involved in the contrast between tense and aspirated fricatives.
 - (2) To use psychoacoustic roughness to identify coarticulatory creaky phonation associated with tense fricatives.
- In addition to acoustic analysis, we use machine learning methods (random-forest (RF) model).
 - RF can yield model accuracy as well as relative importance values for multiple measures, allowing insights into which measures matter in a given contrast.





Participants: 24 Seoul Korean speakers

- Aged 20 27.
- 14 females, 10 males.
- Stimuli: CVCV bisyllables
 - Tense and aspirated fricatives in C1.
 - [a] vowels.
 - C2: lenis or aspirated stops (p, p^h, t, t^h, k, k^h)
 - 6 words with each fricative (= 12 total words)
- Carrier sentence: 단어 X 는 무슨 뜻인가요? ("What does the word X mean?") • 2 repetitions

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Methods – Acoustic Analysis (2)



- A successful model is taken to be one that achieves overall accuracy of 95%.
 - A measure or group of measures is <u>sufficient</u> to learn the contrast if all models that contained those measures were successful.
 - A measure of group of measures is <u>necessary</u> to learn the contrast if the only models that were successful contained those measures.
- Importance measures ranging from 0 to 1 quantify the relative contribution of each measure to the overall model.
 - Importance allows insights into whether a measure is a likely cue.









Measure	Importance
Frication Duration	.745
H1*-A1*	.166
fO	.028
Total Duration	.061



Discussion

- Korean tense and aspirated fricatives are distinguished primarily via frication duration, with laryngeal constriction playing a secondary role.
- RF model results showed that frication duration was necessary but not sufficient on its own to learn the contrast (i.e. to achieve 95% model accuracy).
 - One of spectral tilt or total duration was required in addition to reach 95% accuracy.
 - Total duration and frication duration achieve near perfect accuracy (99.3%) because only for tense fricatives, these durations are exactly the same (no aspiration).





Burmese **Current status** Data collection • The aspirated-unaspirated • 5 speakers (4 female 1 male) fricative contrast is reported to have been disappearing in • 27 target items younger generation. Vowel [a] • 3 tone (creaky, high, low) Preliminary observation of a few • 3 fricatives (aspirated, recordings show no clear tense, voice) phonetic distinction between • 3 word-initial onset ([p, t, k]) the two fricatives. 19



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Conclusion

- Cross-linguistic results have shown the languages may not have identical aspiration duration in aspirated fricatives.
 - Korean with longer aspiration in [s^h]
 - Jinghpaw with shorter aspiration in [s^h]
- Frication duration with a high frequency fricative noise is a salient acoustic cue when distinguishing aspirated fricatives from unaspirated ones.
 - Whether the realization of aspiration, or the realization of laryngealization play a role or not requires further investigation.

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