The perceptual assimilation of Korean obstruents by native Japanese listeners
한국어 폐쇄음에 대한 일본인 청자의 인지적 동화 연구

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Background

▪ One main goal of research in second language (L2) phonological acquisition is to understand the influence of a learner's native language (L1) on his or her acquisition of the L2.

▪ In the case of perception, there is an intuitive link between naïve perception and novice perception:

- If naïve listeners cannot perceive an L2 contrast, then novice learners should have difficulty learning it.
- If naïve listeners can perceive an L2 contrast, then novice learners should be able to learn it easily.

▪ "Perceptual assimilation" refers to the perception of L2 speech sound in terms of L1 phonological categories.

Research question: How do naïve Japanese listeners perceive Korean obstruents in terms of Japanese phonological categories?

▪ Schmidt [1] tested the perceptual assimilation of Korean consonants by L1 English listeners, and Holliday [2] used the stimuli from Schmidt [1] to test L1 Mandarin listeners.

Methods

Participants

▪ 13 native Japanese speakers (11 female, 2 male) were tested in Columbus, OH, USA. All were bilingual in English, and were from different regions of Japan.

▪ The listeners' mean and median length of residence in the US were 25 and 12 months months, respectively.

Stimuli

▪ The stimuli were the same sound files used in Schmidt [1], consisting of 228 CV tokens (19 Korean consonants * 3 vowel contexts * 4 female talkers).

▪ The current paper only reports the results for the 14 Korean lingual obstruents (/p, t, k, p^h, t^h, k^h, p*, t*, k*, tɕ, $tɕ^h$, tɕ*, s^h, s*/), which comprised 168 of the 228 stimuli. The process for recording and selecting the stimuli is described in Schmidt [1].

Procedure

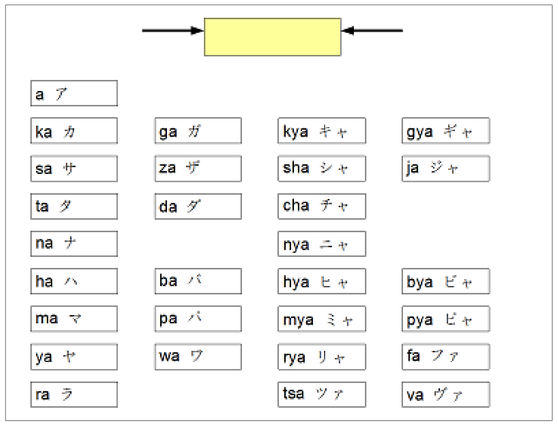
▪ Listeners were seated in front of a laptop computer with headphones. All instructions were presented on the screen in Japanese.

▪ Listeners were told that they would be hearing Korean sounds spoken by Koreans and that after hearing each token they should choose the Japanese sound that it sounded most similar to.

▪ Resposnes were entered in romanized Japanese using a keyboard.

▪ Listeners then rated the similarity of the Korean sound to the Japanese sound they chose on a scale from 1 to 5, with 1 representing "totally different" (全く違う) and 5 representing "exactly the same" (全く同じ).

▪ Stimuli were blocked by vowel context.

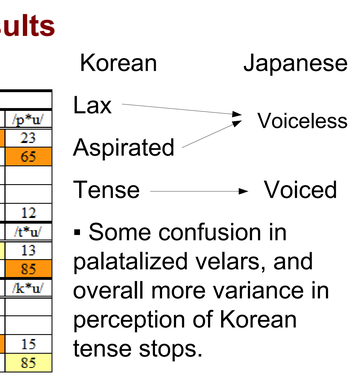


Results

Mean goodness rating: > 4.0 | 3.9 – 3.0 | 2.9 – 2.0

Stops

	Korean								
Japanese	/pa/	/p^ha/	/p*a/	/pi/	/p^hi/	/p*i/	/pɯ/	/p^hɯ/	/p*ɯ/
/p/	98	87	12	67	92	12	92	88	23
/b/			88	24		71	4		65
/t/	2	13		8	6	4	4	8	
/d/				2		8			
/h/									12
	/ta/	/t^ha/	/t*a/	/ti/	/t^hi/	/t*i/	/tɯ/	/t^hɯ/	/t*ɯ/
/t/	98	100	10	94	98	15	81	96	13
/d/			84	2		83	17		85
	/ka/	/k^ha/	/k*a/	/ki/	/k^hi/	/k*i/	/kɯ/	/k^hɯ/	/k*ɯ/
/t/		4	2	19	12	10			
/d/			2			32			
/k/	100	96	2	77	84	16	88	100	15
/g/			94			40	12		85



▪ Some confusion in palatalized velars, and overall more variance in perception of Korean tense stops.

Affricates

	Korean								
Japanese	/tɕa/	/$tɕ^h$a/	/tɕ*a/	/tɕi/	/$tɕ^h$i/	/tɕ*i/	/tɕɯ/	/$tɕ^h$ɯ/	/tɕ*ɯ/
/t/	4	8		10	16	2		2	
/d/	2		13						
/tɕ/	77	71	10	81	82	21	79	94	8
/dz/			71	4		75	21		92
/ts/	17	21		4	2	2		2	
/dz/			6						

▪ Assimilation pattern along VOT dimension follows that of the stops.

▪ Mostly perceived as alveolopalatal, even in the /u/ context, when the alveolar affricate would be phonologically conditioned.

Fricatives

	Korean					
Japanese	/s^ha/	/s*a/	/s^hi/	/s*i/	/s^hɯ/	/s*ɯ/
/s/	90	94			98	100
/ɕ/			92	92	2	
/ts/	6	2		6		
/h/			8			

▪ Both Korean fricatives generally assimilated to a single Japanese category, dependent on vowel context.

▪ Korean /s*i/ was perceived as less similar to Japanese /ɕi/, probably due to a lesser degree of palatalization.

Discussion

▪ The Korean three-way laryngeal contrast in stops and affricates maps consistently onto the Japanese voicing contrast with lax and aspirated stops being being assimilated to voiceless categories and tense stops being assimilated to voiced categories.

▪ The Korean fricatives consistently map onto the same Japanese category: /s/ before /a/ and /u/, and /ɕ/ before /i/.

▪ Perceived place of articulation generally matches the true place of articulation in Korean, although the affricates were perceived as alveolopalatal.

Comparison with L1 English and L1 Mandarin results

▪ The perception of Korean stops and affricates by L1 English and L1 Mandarin patterns along similar lines – long-lag VOT categories are perceived as aspirated or voiceless, and short-lag VOT categories are perceived as unaspirated or voiced.

▪ None of the three L1 listener groups (Japanese, English, or Mandarin) perceive Korean affricates as necessarily alveolar. The most sensible interpretation seems to be that the affricate stimuli used here – at least – were alveolopalatal.

▪ L1 Japanese listeners are predicted to have more difficulty than L1 Mandarin listeners in learning to perceive the Korean fricative contrast – although perception data from Holliday [3] suggests that the two L1 groups are equally poor at identification.

References

[1] Schdmit, A. M. (2007). Cross-language consonant identification. In Bohn, O.-S. and Munro, M. J., editors, *Language Experience in Second Language Speech Learning*, pp. 185–200. John Benjamins, Philadelphia.
[2] Holliday, J. J. (Under review). The perceptual assimilation of Korean obstruents by native Mandarin listeners. Unpublished ms.
[3] Holliday, J. J. (2012). The emergence of L2 phonological contrast in perception: The case of Korean sibilant fricatives. PhD thesis. The Ohio State University.

Acknowledgments

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