Phonology of voiced geminates in Amakusa Japanese

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INTRODUCTION: The phonology of gemination in Standard Japanese has been described in detail. One of the lexical classes in which this kind of phenomenon can be found is Sino-Japanese (Chinese origin, henceforth SJ). The SJ morpheme /nit-/ 日 'sun, Japan' is, for example, realized with gemination if the following morpheme starts with a voiceless obstruent, as in *nip-pon* 日本 'Japan', *nit-tjuu* 日中 'Japan-China', *nik-kan* 日韓 'Japan-Korea'. In contrast, the morpheme never makes geminates when the following consonant is voiced, as in *niti-bei*, *nib-bei 日米 'Japan-US', *niti-doku*, *nid-doku 日独 'Japan-German', *niti-goo*, *nig-goo 日豪 'Japan-Australia'. Even though, as above, voiced geminates are avoided in SJ words in Standard Japanese, some Japanese dialects do allow voiced geminates. One such dialect is Amakusa Japanese, an endangered dialect spoken in the south western island of Kyushu. Records of the dialect contain some SJ words with voiced geminates (Kyushu Hogen Gakkai 1969), such as *ted-doo* 鉄道 'train', *kog-go* 国語 'national language'. The existence of these words raises questions: (1) Are voiced geminates lexical or productive? (2) How should we analyze differences in gemination between dialects?

EXPERIMENT: We interviewed a conservative native speaker of the Fukami dialect of Amakusa Japanese who was born in 1932 (male, 84 years old at the time of the recording). We collected 100 numeral and quantifier (NQ) expressions and 67 SJ words. A NQ consists of numerals which show geminate variation: *1/it-/, 6/rok-/, 8/hat-/, 100/hjak-/* and 25 quantifiers (e.g., *-bjoo* 秒, *-dai* 台, *-zjoo* 畳, *-goo* 号). The Sino-Japanese words consisted of a first element with /-t/ or /-k/ coda in the lexicon (e.g., *zit-* 実, *kat-* 活, *sak-* 作, *kok-* 国) and a second element with obstruents at the onset.

Many voiced geminates were found both in NQs and SJ words. Moreover, the gemination was phonologically conditioned. In both NQs and SJ words, /t/-coda and /k/-coda can be geminated only when followed by a consonant with the same place of articulation (POA). As a result, no geminates are found where the second element starts with /b/. These results can be summarized as in Fig. 1.

	/b-/	/d-/	/z-/	/g-/
/-t/		✓	✓	
/-k/				✓

Fig. 1. Distribution of voiced geminates

DISCUSSION: Our findings can be summarized as below. First, voiced geminates of NQs and SJ words in Amakusa Japanese are not lexical but productive. This is supported by the presence of NQs with low familiarity, such as *rog-guN* 六群 and *haz-zeN* 八膳. Secondly, geminate voicing in Amakusa Japanese is constrained by POA. Voiced gemination is permitted when the coda of the first element and the onset of the second element share the same POA.

Kurisu (2000) proposed a constraint-based generalization of the gemination of SJ words in Standard Japanese. In his analysis, constraints which ban voiced geminates in non-foreign words (No-DD$_{NF}$) and isolated codas (CodaCond) were ranked higher than constraints which ban alternation of POA (Ident[Dor] and Ident[Cor]). In Amakusa Japanese (Fukami dialect), voiced geminates are accepted in NQs and SJ words, so NO-DD$_{NF}$ is ranked lower. Moreover, voiced geminates in the dialect are different from voiceless geminates in that the coda must share a POA with the following onset in input. In other words, the No-DD effect emerges when the POA of the input is changed. This can be expressed as conjoined constraints: No-DD$_{NF}$ & Ident[Place]. As a result, the difference between Standard Japanese and Amakusa Japanese can summarized as in Fig. 2.

Standard Japanese	Amakusa Japanese
CodaCond, No-DD$_{NF}$	CodaCond
|	|
Ident[Dor]	Ident[Dor], No-DD$_{NF}$&Ident[Place]
|	|
Align-root-R	Align-root-R
|	|
Ident[Cor], Align-root-L	Ident[Cor], Align-root-L, No-DD$_{NF}$

Fig. 2. Summary of constraints for voiced geminates