CONSONANT GEMINATION IN ENGLISH LOANWORDS OF JAPANESE

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ABSTRACT

The study is primarily concerned with the consonant gemination (CG) in English loanwords of Japanese. It examines the phonetic conditions under which CG takes place. The experiment reveals that the younger generation is more sensitive to the morpheme condition that prohibits geminating a voiced stop, and that both the younger generation and the older generation today tend to avoid gemination.

Historically, Japanese has been very receptive to loanwords. It would be difficult to find any other language in the world which has been as hospitable to loanwords as has Japanese (Miller, 1967: 236). We find as many as 25,000 loanwords in Arakawa's dictionary (1961) and 34,000 in Iida and Yamamoto's dictionary (1983)[1]. In 1964 the Japanese National Language Research Institute announced that close to one half of the contemporary Japanese words were of Chinese origin, and the words borrowed from other languages, mostly European, amounted to 10%, the greater portion of which came from English. The native Japanese words constituted only 37%. This situation often makes language purists frown.

Most loanwords were first introduced in the Japanese language and reproduced by the borrowing speakers who probably did not have a native control of the source language (SL). The same English words are thus borrowed very frequently with different pronunciations. According to Higa (1979), such words as 'cotton' and '(sewing) machine' have been borrowed by the Japanese dressmakers' circle as katan and mashin[2]. The following are some examples that have more than one variant pronunciation: chekko/cheko 'Czech', firippin/firipin 'Philippines', chiraa/teraa 'tiller', hatsu/haato 'heart'. Moreover, some loanwords such as runessansu 'Renaissance' and sutaffu 'staff' seem to be via spelling, i.e., due to spelling.

The word borrowing is not totally random or unsystematic. The environments in which consonant gemination (CG), for example, occurs are not altogether unpredictable, because the borrowed words (BW) are reshaped to conform to the phonological constraints of the borrowing language (BL)[3]. More precisely, when a source word (SW) contains a segment in the environment which is alien to BL sound pattern, it is modified in conformity with the sound pattern. The reshaping, or the change, which arises due to the two different phonological systems, frequently results from the addition or substitution of sounds, e.g., setto 'set', roosu 'roast'. In Japanese setto, which is from English 'set', we observe addition of the obstruent t (i.e., consonant gemination) and the vowel o (i.e., epenthetic vowel insertion). In some cases, BW's become reshaped to such an extent that they are unrecognizable to the source language (SL) speakers. The following are only a few such examples: katto 'cut', naasu 'nurse', tsuaa 'tour'.

In the present study, we are concerned only with consonant gemination (CG) in English loanwords in Japanese. The study attempts to provide some of the phonological factors that are attributable to the gemination in the loanwords.

There have been various efforts to explain CG of English loanwords in Japanese. Among the most serious studies are Kunihiro (1963); Ohso (1971); and Lovins (1973). They have, however, sufficiently demonstrated the need for more rigorous research in this area. We are thus endeavoring here to supplement some new additional information and reinterpret some of their findings. The following are some of the factors that are responsible for CG:

(1) The Vowel Length Preceding the Word Final Consonant. The final stop or affricate of SW's is systematically geminated if the preceding segment is a short vowel. As the result of this, the syllable so added to increases in its prominance. Consider the data below[4]:

poketto 'pocket'[5], kasetto 'cassette', sunappu 'snap', ṡiroppu 'syrup', panfuretto 'pamphlet', soppu 'shop', baggu 'bag', guddo 'good', katorikku 'Catholic', eggu 'egg', biggu 'big', maccꞑi 'match', suiccꞑi 'switch', kareʒʒi 'college', ankareʒʒi 'Anchorage'

One reason for CG may be due to the durational difference in vowels between the two languages. As also noted by Miller (1967: 255), the borrowed English vowels are heard by the Japanese as markedly short as compared to their corresponding vowels in Japanese [6]. CG is thus used to compensate the difference, so that the prominence of the source vowel may be highlighted and the balance between the two syllables may be sustained. Notice that the sequence -VCCu# in BW's, in which the low pitched u is devoiced following a voiceless consonant, becomes much closer in pronunciation to its corresponding sequence in SW's.

The obstruent that follows a long vowel or diphthong is thus not subject to CG: kooto 'coat', meekaa[7] 'maker', keeki 'cake', paato 'part', seebu 'save', sukoopu 'scope', puropoosu 'propose'. This is due to the unpermitted sequence VVCC in Japanese. Only the consonant clusters allowed in the phonological system of Japanese are the clusters of two identical voiceless obstruents pp, tt, kk, ss, and the mora nasal cluster (e.g., kondo [kǫndo] 'this time', konban [kǫmban] 'this evening', kongetsu [kǫngetsu] 'this month', konsei [kǫnsei] 'mixture')[8]. In this case the first segment of the geminate acquires one mora's duration.

(2) Morpheme Boundary. In the previous studies, the morpheme boundary in a multi-morpheme word has not been rigorously discussed. Rather the phonetic syllable boundary [9] was used as being partly responsible for CG (Ohso, 1971; Lovins, 1973). In our study, it will be shown that the morpheme boundary bears more relevance to CG. We claim that the source word (SW) 'butter', for example, which is pronounced as bataa with the medial consonant ungeminated, is attributable to the absence of the morpheme boundary, whereas SW 'batter', which is pronounced as battaa with the medial consonant geminated, is due to the presence of the boundary. Consider the following data:

basukettobooru (basket-ball), nekkuresu (neck-lace), hettoraito/heddoraito (head-light), fureʒʒaa (fresh-er), suiccꞑingu (switch-ing), fiʒʒingu (fish-ing), ataccꞑimento (attach-ment), kurokkuwaizu (clock-wise), bukkiṡu (book-ish), ṡoppingu (shop-ing), adomittansu (admit-ance), bukkusu (book-s), ċippusu (chip-s), koohii dorippaa (coffee drip-er)

We note above that the morpheme final obstruent is systematically geminated as is the word final obstruent, whether the following morpheme is a substantive or a derivational affix. How about BW nekutai 'necktie' then? It is not exceptional to the rule. Consider the loanwords in which the same morpheme 'neck' consistently undergoes CG at the boundary: nekkupiisu 'neck-piece', nekkurain 'neck-line', nekkubando 'neck-band'. We interpret the degemination as due to the fact that the word was perceived as one morpheme word like such words as kakutasu 'cactus', nekutarin 'nectarine', and napukin 'napkin'.

(3) Stops before s in Word Final Position. We observe that k of the cluster ks#, which is represented by x in some SW's, and p of the cluster ps# are regularly subject to CG as is seen in the examples:

rirakkusu 'relax', bokkusu 'box', sekkusu 'sex', mikkusu 'mix', apendikkusu 'appendix', takkusu 'tax', sakkusu 'sax', pahappusu 'perhaps'

The gemination seems to occur only in word final position. Thus 'boxing' and 'saxophone' are vocalized as bokuṡingu and sakisohon. More examples are: mikuṡingu/mikiṡingu 'mixing', makiṡimamu 'maximum', takuṡii 'taxi'.

Notice that the t of the sequence ts# never undergoes CG in that the cluster of the homoganic ts, which is permitted in the Japanese phonology, automatically becomes tsu word finally.

(4) Stress in Stem Final Syllable. The stress on the stem final syllable in an SW is also pertinent to CG. Thus 'editing' and 'classical', in which the stress does not fall on the vowel immediately preceding the consonant (i.e., éditing and clássical), are not subject to CG; they are vocalized as editingu and kurasikaru. In such SW's as kotteeji/koteeji 'cottage', offaa/ofaa 'offer', and batteri 'battery', the gemination of the obstruent may be attributable to a false impression of the sequences like -age, -er, and -ery as the derivational morphemes, or to spelling influence. Notice the SW's that end in -tion are exceptional to the above rule: adiṡon 'addition'; kondiṡon 'condition'; ediṡon 'edition'.

(5) Palatal Segment. Another factor that has not been well studied in the literature is the relevance of the palatal segment to CG. As will be seen below, the word or morpheme final ṡ regularly undergoes CG, while the non-palatal s does not.

raʒʒu 'rush', fiʒʒu 'fish', raʒʒingu 'rushing', daniʒʒu/danisu "Danish', inguriʒʒu/ingurisu 'English', buraʒʒu/buraṡi 'brush', kisu/kissu [10] 'kiss', kurosu 'cross', hosutesu 'hostess'

The variant danisu, for instance, has not undergone CG due to the non-palatal s. It is noted here that the palatal ṡ of buraṡi is underlyingly /s/, which is automatically palatalized before the palatal i by assimilation in Japanese. In fact, there are very few Japanese words ending in -ssu. The only word that we know of which ends in -ssu is hissu 'indispensible'. There is, however, a small set of words ending in -ʒʒu (e.g., iʒʒu 'a kind of', zaʒʒu 'a mixed breed', daʒʒu 'capture').

One possible explanation for ṡ-gemination may be that the palatal ṡ is, acoustically, of somewhat lower frequency (approx. 25000 Hz) [11] and longer duration as compared with the non-palatal s (approx. 3000 Hz), and is more resonant.

We note, however, that if an s-ending SW is followed by a derivational morpheme, then the stem final s is subject to CG:

doresu 'dress', doreṡi 'dressy', doreṡṡingu 'dressing'; gurasu 'glass', guraṡṡi 'glassy'; kompuresu 'compress', kompuressaa 'compressor'; pasu 'pass', paṡṡingu 'passing'

(6) Obstruent before (ə)n#. The obstruent preceding (ə)n# (i.e., syllabic nasal) is also responsible for CG: kotton 'cotton', fa$$on 'fashion', mi$$on 'mission', le$$un 'lesson'.

(7) Obstruent before Syllabic Lateral. The obstruent that precedes the lateral in word final position or at the morpheme boundary is geminated: bakkuru 'buckle', kyassuru 'castle', kappuringu 'coupling', bakkuringu 'buckling', takkuru 'tackle', appuru 'apple', kappuru 'couple', nikkeru 'nickle', pikkurusu 'picles', hassuru 'hustle'. It is interesting to note that if the first member of the l-cluster is an alveolar top, then CG is blocked. The gemination here seems to occur only when the consonant preceding the lateral is non-coronal. Consider the following data:

ritoru 'little', botoru 'bottle', padoru 'paddle', ratoru 'rattle', $atoru 'shuttle', sadoru 'saddle', ketoru/kettoru 'kettle'

The occurrence of CG with -C1# is further constrained to such an extent that when the vowel before -C1# is preceded by a consonant cluster or unstressed (thus forming a multi-syllable word), CG is also blocked. This is probably due to the stress shift that was caused by the added syllable(s) as seen in the examples below. For instance, in BW toripuru 'triple', the stress has shifted to the preceding syllable (i.e., from ri to to). Notice here that the initial C-cluster, which is not permitted in Japanese morphology, is broken by the paragogic vowel o.

kuripuru 'cripple', puri$ipuru 'principle', marutipuru 'multiple', aatikuru 'article'

We note, however, that in a word like 'pineapple', the p before the lateral is subject to CG in that the word is of two morphemes, thus not affected by the above rule.

Final Obstruent Tend to Be Unvoiced and Degeminated. CG is less regular and less frequent in its occurrence if the consonant is voiced; it fluctuates between the voiced doublet and the voiceless doublet, apparently to conform to the morpheme structure condition in Japanese that does not allow a voiced consonant geminate, as evidenced in the following examples that were enunciated by young Japanese college students:[12]

betto[13]/beddo 'bed', bikku/biggu 'big', hetto/heddo 'head', retto/reddo 'red', ekku/eggu 'egg', bakku/baggu 'bag', detto/deddo 'dead', patto/paddo 'pad', mittonaito/middonaito 'midnight', e$$i/e$$i 'edge', kitto/kiddo 'kid'

The gemination of the voiced labial b occurs only rarely; its occurrence is much more infrequent than that of the other voiced stops d and g. One of the reasons may be that the closure duration of the labial stop is longer than that of the alveolar stop or the velar stop [14], and that the vowel duration is shorter before labials than before alveolars or velars (Peterson and Lehiste: 1960; Lehiste: 1970). The inverse relationship between vowel duration and closure duration of the following stop appears to be maintained[15]. Hence the need for gemination of b is felt less in this context. See some data below:

bobu "Bob', pabu 'pub', hobu 'hub', jobu 'job', nobu/nobbu 'knob', mobbu 'mob', sunobbu 'snob', sukyabbu 'scab'

Ohso (1971) is correct in saying that there is a tendency for the younger generation to avoid geminating a voiced stop, especially the labial stop. This claim was well supported by our experiment [16]. The following are the results:

I. Voiced vs. Voiceless

	Younger Gen.		Older Gen.	
	Vd-CG	V1-CG	Vd-CG	V1-CG
'handbag'	51%	49%	77%	23%
'bed'	60%	40%	83%	17%
'hotdog'	59%	41%	94%	6%

The above list indicates that the younger generation is more sensitive to the morpheme condition rule in Japanese that prohibits the gemination of a voiced stop.

II. Geminated vs. Degeminated.

	Younger Gen.		Older Gen.	
	Gem.	Degem.	Gem.	Degem.
'Philippines'	7%	93%	36%	64%
'pub'	2%	98%	1%	99%
'plug'	6%	94%	3%	97%

Our experiment also shows that there is a tendency that both the younger generation and the older generation avoid gemination. The tendency is stronger with the labial stop.

CONCLUSION

We have discussed some of the factors that cause CG in the realization of English loanwords in Japanese. The study has shown that CG is closely related to such factors as intrinsic segmental duration, durational disparity between SL and BL, stress, morphological boundary, and syllable structure; these are all interrelated intricately. Moreover, the problem of weeding out spelling influenced pronunciation from phonologically conditioned pronunciation additionally reveals the intricate nature of CG.

We admit that the principles provided are not exhaustive and that some of the supporting phonetic evidences are not quite convincing. There may be some exceptions to the rules suggested as there are to most any rule. However, the generalizations made above should hold for the majority of the CG-related loanwords. The occurrence of CG is constrained in such a complicated manner that it is probably not possible to predict the exact contexts in which CG takes place. Further study is still needed in this area.

FOOTNOTES

[1] This does not include loanwords from Chinese. The number of English loanwords has greatly increased since 1945.

[2] These examples are from Higa (1979).

[3] See Kaye and Nykiel (1979).

[4] A large portion of the data listed here was collected from ten native Japanese speakers, who were randomly selected from various categories of employment (including college students and elementary school teachers), and whose ages ranged from 21 to 45. Some data come from numerous secondary sources such as Japanese dictionaries and magazines. We are grateful to Miss Tomomi Hasegawa of Gifu University for her assistance in collecting some valuable data for the present research.

[5] The word final o is a paragogic vowel added to the loanword ending in an alveolar stop. It is to be noted that Japanese words end, without exception, in a vowel or the nasal n, which is the only consonant allowed in word final position (e.g., pan 'bread', kantan 'simple').

[6] Note that the stressed English vowels are slightly longer than unstressed vowels (Klatt: 1976), whereas the Japanese vowel duration is independent of pitch stress (Homma: 1985).

[7] The sequences er and ar in SW's change to aa before a stop or word finally. Furthermore, the diphthongs are flattened to long vowels (e.g., ei to ee, ow to oo).

[8] Japanese is a mora-counting language. In Japanese, a mora functions as the unit of the phonological distance. For further details, see McCawley (1968: 131-4). Notice here that the basic syllable pattern of Japanese is an open syllable.

[9] It is noted that syllabification in English is not uniform, which Ohso (1970) also notes.

[10] In Japanese, CG is sometimes used as a device to make the word expressive (or emphatic). For example, kisu 'kiss' is also emphatically said kissu. See more examples: sugoku (non-emphatic): suggoku (emphatic) 'extremely'; totemo (non-emphatic): tottemo (emphatic) 'very very'.

[11] See Catford (1977). This information is also based on our spectrographic measurements.

[12] Iida and Yamamoto's dictionary (193) lists all the words in this section with the voiced geminates.

[13] Miller (1967: 243-4) claims that the origin of betto is from German Bett. It does not matter here whether the word is of German origin or not.

[14] Homma (1981), Shimizu (1985), and Stathopoulos and Weismer (1983) report that voiced stops are shorter in their closure duration than their voiceless counterparts.

[15] This relationship was also noted in Shimizu (1985).

[16] In the present project, 200 native Japanese speakers participated. Out of the 200 speakers, 100 were English major students in college, who were 20 years old, and the other 100 were mostly college professors, whose ages were in the range of 40 to 65.

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