Phonological Interference of Japanese Uvular /ɴ/ in the pronunciation of English Alveolar /n/ at Ending Distribution

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ABSTRACT

English has been widely used all around the world, either as the first, second, or foreign languages. As foreign language of Japan, English is not daily used, however, since immigration to English speaking countries for educational or business purposes has been common in Japan, more and more people used English within those contexts. A case on the use of English by Japanese is a vlogger Rion Ishida whose speech frequently used uvular /ɴ/ for English alveolar /n/. This study examined the interference of Japanese uvular /ɴ/ which is not common in English in the speech production of English alveolar /n/. The finding shows that at ending distribution, English alveolar /n/ has been pronounced as uvular /ɴ/ in more-than-one-syllable words. In this case, actual phoneme substitution occurs as a result of phonological interference. This is partly caused by the position of the words containing /n/ in the speech and another is caused by the interference of Japanese phonological system which regulates alveolar /n/ to be realized as uvular /ɴ/ at final or ending distribution. Thus, three factors causing phonological interferences consisting (1) the competing phonemic categories, (2) their allophonic membership, and (3) their distributions are all evident in this study.

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INTRODUCTION

The need of mastering second or foreign language today has been so profound that interaction between or among languages has been inevitable. The interactions have result in cross-linguistic influences, whether it is positive or negative. There is no pair of languages that has exactly the same linguistic system. According to linguist Bernard Comrie, languages differ in numerous ways, including phonetics, syntax, and semantics. For instance, while two languages might share a common structure, such as subject-verb-object (SVO) word order, the specific rules and constraints governing sentence formation, as well as the semantic roles of words, can vary significantly (Comrie, 1989). Thus, the similarities between language systems may result in positive transfer, where knowledge from the L1 aids in learning the L2 (Swan & Smith, 2001). However, differences between language systems may pose negative transfer, where aspects of the L1 interfere with L2 learning that is often manifested in errors related to pronunciation, grammar, or usage (Ellis, 2008).

English is the most widely-used second or foreign language in most countries in the world. British Council has also reported that there has been shift currently in the use of English in Education in countries around the world where it is used as the medium of instruction (EMI) for academic subjects rather than just taught as foreign language (Dearden, 2014). One of the countries that used English as its foreign language is Japan. In Japan, English has been taught at school but not used in everyday communication nor as official language as in India, Singapore, Philippines, etc. where English has been the second language. Thus positioned English as foreign language. Richards and Schmidt (2010) defined that second language as a language learned in a country where it is spoken as a primary language, while foreign language refers to a language learned in a setting where it is not widely spoken and is typically used in more formal or academic contexts. Thus, since Japanese exclusively use Japanese as the first and national language, for most Japanese, English is their foreign language. However, to make the discussion easier to follow, this paper will use the term L1 for the first or native language and L2 for any language that is learned in addition to L1 (Ellis, 2008).

Increasing used of English has been evidenced in Japan, Japan has been initiating policy on internationalizing Higher Education (HE) by introducing EMI programs as over the past 20 years which is not only exclusively for international students but also for domestic students (Rose & McKinley, 2018). Thus, given the increasing use of English in education, Japanese gets more and more contact with English, especially in education setting. However given the fact that English has not been used in every day communication, the influence of L1 may be greater in the acquisition process. A Japanese may experience cross-language influences which inevitably occur as a result of differences in linguistic system.

As for the case of Japanese, cross-language influence of L1 in English acquisition may profoundly appear in the pronunciation since the differences on phonological system are apparent. The term phonological interference has been used to specifically refer to phonological influences (Patricia Pulliam Philips & Cathy A. Stawarski, 2008). Evidence on difficulty resulted on the perception or production of certain phonemes has been demonstrated in several previous studies. Aoyama (2003)(Phany & Dara, 2024) have identified the difficulty of Japanese speakers with English syllable /n/-/ŋ/ and /m/-/ŋ/ in final position. Further, studies on the perception of Japanese moraic nasal /N/ among Japanese and Korean learners of Japanese have also been investigated that resulted in the tendency of Japanese to perceive /N/ higher than the Korean learners (Han & Namba, 2023). However, there is variability of the realization of final nasal consonants among Japanese and the reason is still not clear, although the preceding vowels may contribute to the realization (Yuhki & Ryoko, 2016). The variability is also evidence in rtMRI analyses by Maekawa (2023) who found that preceding vowel may influence the realization of /N/ ranging from alveolar to uvular, and the realization is considered highly variable. Results of electropalatography (EPG) by Colantoni et al. (2023) also demonstrate that different realization of English alveolar /n/ by Japanese. However, it is not categorized as /N/ instead the research found the realization varies into /n/ and /ŋ/.

Those studies explained have enumerated the negative effects of phonological influences of L1 in the perception and production of L2 or L3. The variability of realization of /n/ and /N/ among Japanese in the previous studies and the absence of strong argument on the cause of the phonological interference as well as the variability of realization have motivated the researcher to investigate the influences of Japanese uvular /ɴ/ in the pronunciation of English alveolar /n/ at the ending distribution.

11

THEORY AND METHOD

Cross-linguistic influence (CLI) includes three linguistic domains that are phonology, lexicon, and morphosyntax (Elgort et al., 2023). Other resources use the term interference to refer to CLI (Brière, 1968). The term transfer has also been used to refer to CLI. This is because CLI related to transfer of learning which involves the use of previous knowledge in new situations (Seel, 2012). In this current study, the term interference will be used among other terms to refer to the influence of linguistic properties of one language to the production or perception of another language- the two modalities of language performance (Wrembel et al., 2024). Moreover, the term phonological interference has been used to specifically refer to phonological influences.

This current study will use Brière (1968) theory on the three factors causing phonological interference which include (1) the competing phonemic categories, (2) their allophonic membership, and (3) their distributions. However, before examining the cause of interferences, Weinreich and Martinet (1968) theory on the types of phonological interferences will be used to analyze the realization of English phoneme /n/. Weinreich and Martinet (1968) classification on phonological interference includes:

(1) under-differentiation of phonemes: two phonemes in the second language are not differentiated in the first language which cause the same pronunciation for both phonemes.
(2) over-differentiation of phonemes: differentiation of two phonemes in the second language as a result of the first language distinction while in the second language the two phonemes are not differentiated.
(3) reinterpretation of distinctions: differentiation of phonemes in the second language influenced by the first language system which is not relevant to the second language system.
(4) actual phoneme substitution: the substitution of phoneme with another phoneme that is identically defined in both languages while the actual pronunciation differs.

The design of the present study is mix-method. The researcher combines both quantitative and qualitative data in a single study (Creswell, 2017). Considering the sequence of the methods applied, a sequential explanatory strategy is used in this research. This type of mix-method is implemented with regards on the characteristic of the study where the collection and analysis of the quantitative data comes first and followed by the collection and analysis of the qualitative data (Creswell, 2017). A case study with causal-process tracing approach (CPT) is integrated in the mix-method to achieve a thorough overview on the temporal explanation of the causal-process (Blatter & Haverland, 2012). This CPT approach is used in the quantitative data analysis.

Data

The data in this study is taken from a YouTube video of Rion Ishida, a Japanese youtuber. This youtuber was born and raised in Japan. He grew up in Japan until high-school, went to U.S. for learning English, and went to China for learning Chinese. He then came back to U.S. for University. After he graduated from U.S. university, he came back to Japan and worked for a Japanese company before resigning and starting a YouTube channel. Throughout his video about travelling around Japan, the researcher noticed that he repeatedly pronouncing word ending -ion as [-ʃɔɴ] which is not the correct pronunciation. As the researcher investigate further, there is tendency in changing ending /n/ to /ɴ/. Thus, the researcher collects literatures on Japanese and English phonemes, compares it, and analyze the differences.

The video "Should You Avoid New Bill in Japan? New Bill Availability in Ginza and Tokyo Station Ep.499" taken from https://www.youtube.com/watch?v=ybkHODcLMsU&t=1477s is chosen as at the time of the study. This was the newest video and the content of the video contains representative of Rion's pronunciation of phoneme /n/.

Data Collection Method

The fact that CPT is a within-case analytical technique, one case is considered enough (Blatter & Haverland, 2012). Thus, this current study investigates only one case, that is the case of pronunciation of English alveolar /n/ placed at ending distribution in one of Rion Ishida youtube video. Within the case, as the prime requirement in selecting a case for CPT approach, the case of Rion Ishida is considered to be able to show a strong positive result or as hypothesized by the researcher will show effects of Japanese uvular /ɴ/ in the pronunciation of English alveolar /n/ at ending distribution.

In collecting the data, the researcher conducted an observation and documentation. Observation for observing the realization of alveolar /n/ in the Rion Ishida video. While in documentation on documented repositories on Japanese and English phonemic system as well as their differences, especially in the acoustic properties of /n/ and /ɴ/ sound are collected to be qualitatively analyzed to explain the possible cause of the realization of alveolar /n/ by Rion Ishida.

Data Analysis Method

Since the researcher design is mix-method. Two steps of data analysis are applied. In the first phase the quantitative data presentation together with the descriptive quantitative are performed. Quantitative descriptive analysis involves identifying patterns in data within purpose of answering questions about who, what, where, when, and to what extent by using what we understand about capacities, needs, methods, practices, policies, populations, and settings in a relevant manner to a specific research or policy question (Loeb et al., 2017). The second phase include the discussion of the quantitative result in regards to the causal-process. Within this phase is the examination on the qualitative data gathered from the documentation. A comprehensive storyline in the second phase is intended to fulfill the CPT approach analysis technique which is aimed at extracting 'causal chains' and 'causal conjunctions'; detailed descriptions of the realization of alveolar /n/ (Blatter & Haverland, 2012). In analyzing the realization, phonological process analysis is incorporated to describe the interference happen by using Weinreich and Martinet (1968) classification on phonological interference which includes under-differentiation of phonemes, over-differentiation of phonemes, reinterpretation of distinctions, actual phoneme substitution. With this approach, even using only one case, 'possibilistic generalization' will be able to be obtained (Blatter & Haverland, 2012). In addition, three causes based on Brière (1968) which include (1) the competing phonemic categories, (2) their allophonic membership, and (3) their distributions are examined during the analysis.

RESULT AND DISCUSSION

The discussion of the results is divided into two sections in accordance to the analysis method used. In the first phase, the quantitative data presentation together with the descriptive quantitative are performed. In the second phase, the discussion of the quantitative result in regards to the causal-process is demonstrated.

1. The Rion Ishida's Realization of Alveolar /n/

During the observation of the production of alveolar /n/ at ending distribution, the researcher noticed that most of the pronunciations were pronounced as uvular /ɴ/ as hypothesized. The findings can be demonstrated by the following table.

Table 1. Realization of phoneme /n/ in one-syllable words

No	Words	AE Transcription	Realization /n/	/ɴ/
1	in	[ɪn]	28	5
2	one	[wʌn]	22	41
3	can	[kæn]	11	3
4	on	[ɑn]	5	0
5	down	[daʊn]	0	3
6	zone	[zoʊn]	0	1
7	town	[taʊn]	0	3
8	then	[ðɛn]	1	0
9	born	[bɔrn]	1	0
10	turn	[tɜrn]	0	1
11	than	[ðæn]	1	0
12	train	[treɪn]	4	1
13	clean	[klin]	1	0
14	coin	[kɔɪn]	3	3
15	corn	[kɔrn]	5	0
16	ten	[tɛn]	9	1
17	fan	[fæn]	0	1
18	fine	[faɪn]	0	1
19	gone	[gɔn]	0	2
20	line	[laɪn]	4	1
21	main	[meɪn]	1	0
22	Man	[mæn]	0	1
23	noon	[nun]	1	0
24	plan	[plæn]	0	1
25	sign	[saɪn]	0	4
26	when	[wɛn]	1	0
27	win	[wɪn]	1	0
Total			**97 (57.06%)**	**73 (42.94%)**

As concerns the former, in the case of our Japanese-speaking learners whose L1 neutralizes all independent place in coda nasals, acquiring /m/ and /ŋ/ was relatively easier than /n/. Related to the acquisition of new contrasts is also our finding of doubly articulated nasals, produced occasionally by all of our L2 (Colantoni et al., 2023).

For one-syllable words, the correct pronunciation of alveolar /n/ is higher than the uvular /ɴ/ which comprises 97 occurrences or 57.06% of the total realization of phoneme /n/. However, the pronunciation of phoneme /n/ into uvular /ɴ/ which comprises 42.94% is considered high. This finding is consistent with the previous studies that found variability in the realization of /n/ and /N/ (Yuhki & Ryoko, 2016)(Maekawa, 2023)(Colantoni et al., 2023).

Those realizations of uvular /ɴ/ in one-syllable words, however, if compared to the more-than-one-syllable words is not significant. In more-than-one-word syllable words, there are 79 out of 97 occurrences or equal to 81.44% which were realized as

uvular /ɴ/. While only 18.56% of the /n/ occurrences at ending distribution that is realized as alveolar /n/. The following table shows the realization of phoneme /n/ in more-than-one-syllable words.

Table 2. Realization of phoneme /n/ in more-than-syllable words

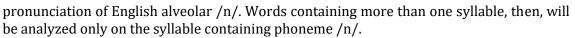| No	Words	AE Transcription	Realization	
			/n/	/ɴ/
1	station	[ˈsteɪʃən]	1	28
2	Japan	[ʤəˈpæn]	1	11
3	intersection	[ˌɪntərˈsɛkʃən]	0	8
4	season	[ˈsizən]	2	2
5	garden	[ˈgɑrdən]	1	0
6	golden	[ˈgoʊldən]	2	0
7	even	[ˈivɪn]	2	1
8	pedestrian	[pəˈdɛstriən]	0	1
9	person	[ˈpɜrsən]	2	0
10	question	[ˈkwɛstʃən]	0	1
11	machine	[məˈʃin]	2	10
12	million	[ˈmɪljən]	1	0
13	mannequin	[ˈmænəkɪn]	0	1
14	direction	[dəˈrɛkʃən]	0	1
15	kindergarten	[ˈkɪndərˌgɑrtən]	1	0
16	seven	[ˈsɛvən]	0	1
17	construction	[kənˈstrʌkʃən]	0	1
18	conclusion	[kənˈkluʒən]	0	1
19	design	[dɪˈzaɪn]	2	0
20	edition	[əˈdɪʃən]	0	1
21	election	[ɪˈlɛkʃən]	0	3
22	everyone	[ˈɛvriˌwʌn]	0	1
23	lemon	[ˈlɛmən]	1	4
24	reason	[ˈrizən]	0	1
25	vacation	[veɪˈkeɪʃən]	0	3
26	version	[ˈvɜrʒən]	0	1
27	button	[ˈbʌtən]	0	1
Total			**18 (18.56%)**	**79 (81.44%)**

This present study is limited to the segmental analysis that is the variation of the realization of alveolar /n/ and is not concentrated on the length or shortness of the words, rapid or slow speech, or other suprasegmental aspects although there has been claim on the different pronunciation of rapid speech (O'Grady & Dobrovolsky, 1997). Thus, generalization that for longer words, alveolar /n/ is more likely to be pronounced /ɴ/ cannot be drawn due to the lack of empirical evidence that is analysis on the suprasegmental aspects. This study can only conclude that substitution of phoneme /n/ to uvular /ɴ/ is higher in the more-than-one-word-syllable words.

Since the data shows inconsistent results on the pronunciation of English /n/ in general, the researcher attempted to investigate the tendencies based on the syllable. This consideration is also based on the previous studies that stated the possibility of preceding vowel influence in the realization of of /n/ and /N/ (Yuhki & Ryoko, 2016)(Maekawa, 2023). Thus, the discussion is about to be divided based on the nucleus of the syllable (the vowel). This approach is aimed at diving deeper into what causes variation of

pronunciation of English alveolar /n/. Words containing more than one syllable, then, will be analyzed only on the syllable containing phoneme /n/.

Further discussion on the realization eventually classified into the similarity of nucleus or vowel in the syllable. However, there is one category added based on morphological structure, that is the derivation suffix -ion (tion/sion) pronounced as [ʃən] [ʒən]. This addition is based on the similarity of data found in the research.

Syllable with nucleus vowel /ʌ/

Phoneme /n/ frequently appeared with phoneme /ʌ/ in the word "one". There are 22 occurrences of phoneme /n/ pronounced correctly as alveolar sound. However, the occurrences for uvular /ɴ/ realization are higher, comprising 41 occurrences or 65.08%. When closely observed, alveolar /n/ realization occurs when the word "one" is in the middle of speech where intonation is stable and short. While uvular [ɴ] realization occurs when the word "one" is at the end of speech where intonation is falling and long. Theoretically, this is explained as a part of phonological process called as assimilation, distinction of assimilation in rapid speech and slow speed exist (O'Grady & Dobrovolsky, 1997). However, a close observation is required and thus further study on this aspect may be considered for future research. The number of occurrences for phoneme /n/ in the syllable with nucleus vowel /ʌ/ can be seen in the following table.

Table 3. Realization of phoneme /n/ in syllable with nucleus vowel /ʌ/

No	Words	AE Transcription	Realization		Total
			/n/	/ɴ/	
1	one	[wʌn]	22 (34.92%)	41 (65.08%)	63
2	everyone	[ˈɛvriˌwʌn]	0	1 (100%)	1
Total			**22 (34.37%)**	**42 (65.63%)**	**64**

The following is the examples of sentences where the word "one" pronounced differently.

Example 1: It is **one** of the most popular travel spot in Japan.
[wʌn]

Example 2: So this **one**, it's more easy to recognize for the travelers.
[wʌɴ]

Example 3: This is the old **one**.
[wʌɴ]

In Example 1, the word "one" is in the middle of speech and /n/ was pronounced correctly as alveolar sound. For Example 2 and 3 are both at the end of speech (ended with comma and ended with full stop). The realizations were both as uvular /ɴ/.

Syllable with nucleus vowel /æ/ or /ɜ/

For syllable with nucleus vowel /æ/ or /ɜ/, there are in total 43 occurrences with more than half are realized as alveolar /n/ or 24 occurrences or 55.81%. However, this figure is not significantly different from the realization as uvular /ɴ/ which comprises 44.19%. The following table shows data on words with syllable with nucleus vowel /æ/ or /ɜ/.

16

Table 4. Realization of phoneme /n/ in syllable with nucleus vowel /æ/ or /ɜ/

No	Words	AE Transcription	Realization		Total
			/n/	/ɴ/	
1	can	[kæn]	11 (78.57%)	3 (21.43%)	14
2	then	[ðɛn]	1 (100%)	0	1
3	turn	[tɜrn]	0	1 (100%)	1
4	than	[ðæn]	1 (100%)	0	1
5	ten	[tɛn]	9 (90%)	1 (10%)	10
6	fan	[fæn]	0	1 (100%)	1
7	Man	[mæn]	0	1 (100%)	1
8	plan	[plæn]	0	1 (100%)	1
9	when	[wɛn]	1 (100%)	0	1
10	Japan	[dʒəˈpæn]	1 (8.33%)	11 (91.63%)	12
Total			**24 (55.81%)**	**19 (44.19%)**	**43**

Table 4 shows that there are two words with almost equally high occurrences, the word "can" (one-syllable word) and "Japan" (more-than-one-syllable word). The first is 78.57% realized as alveolar /n/ while the latter is 91.63% realized as uvular /ɴ/.

Syllable with nucleus vowel /aʊ/, /oʊ/, or /ɔ/
The following table demonstrates the occurrences of /n/ in syllable with nucleus vowel /aʊ/, /oʊ/, or /ɔ/.

Table 5. Realization of phoneme /n/ in syllable with nucleus vowel /aʊ/, /oʊ/, or /ɔ/

No	Words	AE Transcription	Realization		Total
			/n/	/ɴ/	
1	down	[daʊn]	0	3 (100%)	3
2	zone	[zoʊn]	0	1 (100%)	1
3	town	[taʊn]	0	3 (100%)	3
4	gone	[gɔn]	0	2 (100%)	2
5	born	[bɔrn]	1 (100%)	0	1
6	corn	[kɔrn]	5 (100%)	0	5
7	on	[ɑn]	5 (100%)	0	5
Total			**11 (55%)**	**9 (45%)**	**20**

17

There are in total 20 occurrences as shown in Table 5. There are two tendencies can be drawn from the figure. The first is that for syllable with diphthong which ends with vowel /ʊ/ in the nucleus (/aʊ/, /oʊ/, /aʊ/), for all occurrences, the alveolar /n/ was realized as uvular /ɴ/. The second is for syllable with nucleus /ɔ/ followed by consonant /r/ before /n/ ending, all were realized correctly as alveolar /n/. Other words cannot indicate any tendency since only single occurrence presents.

Syllable with nucleus vowel /eɪ/, /ɪ/, /i/, /ɔɪ/, /aɪ/, or /eɪ/

Syllables with nucleus vowel or diphthong containing short /ɪ/ or /i/ are mostly realized as correct alveolar /n/ with 57 of 84 occurrences in total or comprising 67.86%. Table 6 contains detail information on the occurrences of /n/ in syllable with nucleus vowel /eɪ/, /ɪ/, /i/, /ɔɪ/, /aɪ/, or /eɪ/.

Table 6. Realization of phoneme /n/ in syllable with nucleus vowel /eɪ/, /ɪ/, /i/, /ɔɪ/, /aɪ/, or /eɪ/

No	Words	AE Transcription	Realization /n/	/ɴ/	Total
1	train	[treɪn]	4 (80%)	1 (20%)	5
2	clean	[klin]	1 (100%)	0	1
3	coin	[kɔɪn]	3 (50%)	3 (50%)	6
4	fine	[faɪn]	0	1 (100%)	1
5	line	[laɪn]	4 (80%)	1 (20%)	5
6	main	[meɪn]	1 (100%)	0	1
7	sign	[saɪn]	9 (69.23%)	4 (30.77%)	13
8	win	[wɪn]	1 (100%)	0	1
9	in	[ɪn]	28 (84.85%)	5 (15.15%)	33
10	even	['ivɪn]	2 (66.67%)	1 (33.33%)	3
11	machine	[mə'ʃin]	2 (16.67%)	10 (83.33%)	12
12	mannequin	['mænəkɪn]	0	1 (100%)	1
13	design	[dɪ'zaɪn]	2 (100%)	0	2
Total			**57 (67.86%)**	**27 (32.14%)**	**84**

Highlights can be given to the word "in" which function as preposition and has similarity with "on" in Table 5. Those two prepositions similarly realized as correct alveolar /n/. Based on the position in the speech, assumption that the possible cause for this realization is that the pronunciation is short and in stable intonation because it is the middle of inseparable speech or often connected speech may arise. However, this finding is not aligned with the finding of Yuhki and Ryoko (2016) who found that for /N/ with high vowel /i/ preceding it, /N/ was consistently realized as uvular.

Syllable with nucleus vowel /u/

The following table contains data gathered from the realization of alveolar /n/ in syllable with nucleus vowel /u/.

Table 7. Realization of phoneme /n/ in syllable with nucleus vowel /u/

No	Words	AE Transcription	Realization		Total
			/n/	[ɴ]	
1	noon	[nun]	1	0	1
Total			**1 (100%)**	**0**	**1**

For this category, no conclusion can be drawn since only 1 occurrence of alveolar /n/ combined in the syllable with vowel /u/. Thus, data under this category is inconclusive.

Syllable with nucleus vowel /ɪə/, /ə/, or /iə/

The following table shows data on the realization of alveolar /n/ in syllable with nucleus containing English schwa vowel /ə/ (both monophthong and diphthong /ɪə/, /ə/, or /iə/).

Table 8. Realization of phoneme /n/ in syllable with nucleus vowel /ɪə/, /ə/, or /iə/

No	Words	AE Transcription	Realization		Total
			/n/	/ɴ/	
1	season	[ˈsizən]	2 (50%)	2 (50%)	4
2	garden	[ˈgɑrdən]	1 (100%)	0	1
3	golden	[ˈgoʊldən]	2 (100%)	0	2
4	pedestrian	[pəˈdɛstriən]	0	1 (100%)	1
5	person	[ˈpɜrsən]	2 (100%)	0	2
6	million	[ˈmɪljən]	1 (100%)	0	1
7	kindergarten	[ˈkɪndərˌgɑrtən]	1 (100%)	0	1
8	seven	[ˈsɛvən]	0	1 (100%)	1
9	lemon	[ˈlɛmən]	1 (20%)	4 (80%)	5
10	reason	[ˈrizən]	0	1 (100%)	1
11	botton	[ˈbʌtən]	0	1 (100%)	1
Total			**10 (50%)**	**10 (50%)**	**20**

Data under this category as seen in Table 8 can be said to be inconclusive too since the result shows 50:50 occurrences of /n/ and /ɴ/. Greater number of data is required for this category to enable generalization.

Words with suffix -ion ([ʃən] or [ʒən])

Special category is given to English morphological suffix **-**ion. This is under consideration of the amount of data on the occurrences of phoneme /n/ at ending distribution of words with suffix -ion which have two pronunciations (based on syllable -tion/-sion or [ʃən] or [ʒən]). There are 51 occurrences under this category with 49 of them or 96.08% are pronounced as uvular /ɴ/. Not only that the /n/ changed into uvular, for this category, the schwa vowels /ə**/** were changed into /ɔ/. So, the pronunciation is not [ʃən] or [ʒən] but [ʃɔɴ] or [ʒɔɴ]. Table 9 shows data on this category.

Table 9. Realization of phoneme /n/ in words with suffix -ion ([ʃən] or [ʒən])

No	Words	AE Transcription	Realization		Total
			/n/	/ɴ/	
1	station	[ˈsteɪʃən]	1 (3.45%)	28 (96.55%)	29
2	intersection	[ˌɪntərˈsɛkʃən]	0	8 (100%)	8
3	question	[ˈkwɛstʃən]	0	1 (100%)	1
4	direction	[dəˈrɛkʃən]	0	1 (100%)	1
5	kindergarten	[ˈkɪndərˌɡɑrtən]	1 (100%)	0	1
6	seven	[ˈsɛvən]	0	1 (100%)	1
7	construction	[kənˈstrʌkʃən]	0	1 (100%)	1
8	conclusion	[kənˈkluʒən]	0	1 (100%)	1
9	edition	[əˈdɪʃən]	0	1 (100%)	1
10	election	[ɪˈlɛkʃən]	0	3 (100%)	3
11	vacation	[veɪˈkeɪʃən]	0	3 (100%)	3
12	version	[ˈvɜrʒən]	0	1 (100%)	1
Total			**2 (3.92%)**	**49 (96.08%)**	**51**

The tendency inclined heavily on the uvular /ɴ/, while generalization cannot be drawn for the word "kindergarten" due to the lack of occurrences, discussion on the word "station" can be performed. Only one occurrences of the word "station" that is pronounced correctly as [ˈsteɪʃən] with alveolar /n/. Contrast on speech level can be examined from the following examples.

Example 4: Hey guys today we are in Ginza **Station**.

[ˈsteɪʃɔɴ]

Example 5: You can directly go from the Tokyo **Station** to Ginza and it will be much

[ˈsteɪʃən]

cooler.

Example 4 demonstrates the position of the word "station" at the end of the sentence or speech, indicating ending of speech with falling intonation. While Example 5 shows the

position of the word "station" in the middle of the speech indicating stable or flat intonation and, in that case, the alveolar /n/ was realized correctly.

2. The Cause of Inconsistencies in Rion Ishida's Realization of Alveolar /n/

At ending distribution, the alveolar /n/ has been inconsistently realized as correctly alveolar /n/ and as uvular /ɴ/ that can be categorized as actual phoneme substitution (Weinreich & Martinet, 1968). This result aligns with result from (Anjarningsih & Saraayu, 2016) who contrast English and Japanese phonetic and pointed out five differences which include addition of vowel sound, changes of syllable, changes of height and place of vowel articulation, replacement of consonant with another consonant, and elisions of consonant. Thus, the finding on phoneme substitution of alveolar /n/ with uvular /ɴ/ here agrees to the previous finding on the replacement of consonant with another consonant.

Given prior discussion on the quantitative data, the cause of the substitution can be partly attributed on the number of syllable and the position of words in the speech. The number of syllables did affect the realization since results on one-syllable words and more-than-one-syllable words differs significantly with the correct pronunciation of alveolar /n/ is higher than the uvular /ɴ/ which comprises 97 occurrences or 57.06% of the total realization of phoneme /n/ in one-syllable words while, in more-than-one-word syllable words, there are 79 out of 97 occurrences or equal to 81.44% which were realized as uvular /ɴ/. In addition, the position of words in the speech is another factor as in the data deviations did occur as a result of the word position in the speech as in the word "station".

To understand the difference of phonemic system in English and Japanese especially the alveolar /n/, the following is International Phonetic Alphabet of English:

	Bilabial		Labio-dental		Dental		Alveolar		Post-alveolar		Retroflex	Palatal	Velar		Uvular	Glottal
Plosive	p	b			[t̪]	[d̪]	t	d					k	g		[ʔ]
Aspirated plosive	[pʰ]				[tʰ]								[kʰ]			
Affricate									t͡ʃ	d͡ʒ						
Fricative			f	v	θ	ð	s	z	ʃ	ʒ			[x]			h [ɦ]
Nasal		m			[n̪]		n							ŋ	[ɴ]	
Tap							[ɾ]									
Approximant		w					ɹ				[ɻ]	j				
Lateral approximant					[l̪]		l, [ɫ]									

Picture 1. English IPA Consonants (Whitman, 2022a)

From the phonological system point of view of Japanese and English, great differences appear in the phonemic system. For nasal, English the uvular nasal /ɴ/ is a variant pronunciation of the phoneme /l/ (Whitman, 2022a). Thus, it differs greatly from alveolar /n/. While in Japanese, /ɴ/ is a variation of nasal /n/ which is only allowed in the middle and final distribution the sound /ɴ/ in Japanese is like the word [mɑŋ.ga] (manga: "comic"), [sẽmpai̯] (senpai: "Senior"), and [ɲi.hoN] (*nihon*: "Japan") (Sesefanakh & Febriyanti, 2022). The final distribution of nasal̩ variation /n/ is realized as uvular /ɴ/ in Japanese. From the data, it is clear that this phonological system has greatly influence the pronunciation of English alveolar /n/ at ending distribution.

However the influence of Japanese here is also at the same time a positive interference, since Rion Ishida here was able to pronounce consonant at ending without addition of vowel while in Japanese only uvular consonant /ɴ/ is allowed at ending distribution whereas words in Japanese are open syllable (Adnania Nugra & Subiyanto, 2023). This study, then, support the finding of Yuhki and Ryoko (2016) whose result demonstrate substantial degree of freedom in the word final /N/ among Japanese despite its phonological rule.

	Bilabial		Denti-alveolar		Post-alveolar		Retro-flex		Alveolo-palatal		Velar		Uvular		Glottal	
Plosive	p	b	t̪	d̪			[ɖ]				k	g				
Affricate			[t͡s]	[d͡z]					[t͡ɕ]	[d͡ʑ]						
Fricative	[ɸ]	[β]	s	z					[ɕ], [ç]	[ʑ]	[ɣ]				h	
Nasal		m		n̪						[ɲ̊]		[ŋ]		[ɴ]		
Tap				ɾ			[ɽ]									
Lateral tap				[ɺ]												
Approximant		β̞					[ɹ]			j		[ɰ]				
Lateral approximant				[l]		[ɭ]	[ɭ]									

Picture 1. Japanese IPA Consonants (Whitman, 2022b)

Finally, from the above discussion, Japanese phonological system plays a major role in the realization of English alveolar /n/ into Japanese uvular /ɴ/. This case has been evidently presenting the interference of Japanese uvular /ɴ/. The results from quantitative discussion and the contrast of Japanese and English phonological system has provide evidence on the three factors of phonological interference by Brière (1968) which include (1) the competing phonemic categories where the category of nasal /n/ in English has no uvular sound as phoneme while in Japanese, in addition to the nasal /n/, there is uvular /ɴ/ which occurs in the middle and final distribution (Rambe & Rangkuti, 2022), (2) their allophonic membership while in Japanese the uvular /ɴ/ is phoneme it is not the case in English which does not have phoneme uvular /ɴ/, instead it is considered as allophone of the phoneme /l/, thus explain the different allophonic membership of both languages, and (3) their distributions are explained in the study as the result shows great impact of those two previous cause on the final distribution.

CONCLUSION
Phonological interference of Japanese has been evidently examined in both quantitative and qualitative discussion. The data of the present study shows that Japanese uvular /ɴ/ has caused Japanese to replace nasal /n/ at ending distribution to uvular /ɴ/. Though another factor affects the inconsistencies of realization, that is the place of the words containing nasal /n/ in the speech (in the middle of speech or ending of speech). However, this research is limited to the segmental analysis that is the variation of the realization of alveolar /n/ and is not concentrated on the length or shortness of the words or other suprasegmental aspects. For this reason, generalization cannot be drawn on this factor due to the lack of empirical evidence that is analysis on the suprasegmental aspects. This study can only conclude that substitution of phoneme /n/ to uvular /ɴ/ is higher in the more-than-one-word-syllable words.

In addition, Japanese phonological rules on the variation of /n/ at ending position as uvular /ɴ/ have greatly influenced the realization of English alveolar /n/ at ending distribution. Thus, this study has been evidently presenting the interference of Japanese uvular /ɴ/ on the three factors of phonological interference by Brière (1968) which include (1) the competing phonemic categories, (2) their allophonic membership, and (3) their distributions.

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