NATIVE LANGUAGE INFLUENCE ON THE PRODUCTION OF ENGLISH SOUNDS BY JAPANESE LEARNERS

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Abstract

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The influence of the native language in learning a foreign language is certainly indispensable. This influence can be either positive or negative. In order to observe the circumstances under which this influence is positive and/or negative, the following study was conducted in English phonology. The study describes the phonological analysis of Japanese speakers learning English as a foreign language. It was carried out at a phonemic level, and reflects learners' performance in the target language at a specific stage of interlanguage. A non-comprehensive comparison between the English and the Japanese sound systems was made and the "so-called" problem causing sounds were diagnosed, and were employed in texts and presented to learners for reading. Results obtained from this study suggest that while some sounds were found to pose some difficulty of production, and that the difficulty is attributable to NL, others were produced with much less difficulty due to the already-present NL system of phonology. Other non-interlingual learning strategies were also observed to be employed by the learners in producing English sounds.

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Introduction

Aiming to shed light on English phonemic production of Japanese speakers of English, this study draws its theoretical roots from contrastive analysis and the interference theory. Thus, before we proceed with the actual study itself, we would like to provide a concise introduction to these two approaches towards FL learners' language output.

Throughout the twenty years of its influence on the field of applied linguistics, contrastive analysis has proved to be one of the most important studies ever made in describing systems of languages. Two main versions of CA have asserted themselves in the field of foreign-language teaching. The two versions are based on the assumptions of L1 interference[1]. The strong version (a priori) claims to have the power to predict learners' errors, while the weak version (ex post facto) diagnoses errors. As L1 interference is central in both versions, the learner's native language is considered to be an obstacle during the learning process. It is the learner's native language that impedes or facilitates learning; corresponding points are easy to learn, and thus they offer no problems, while contrasts lead to important problems. Only when linguistic transfer from L1 to L2 is minimized, or eradicated, can learning of a foreign language be possible.

Lado (1957) claims that the grammatical structure of the native language tends to be transferred to the foreign language, and for him here lies the major source of problems in study and acquisition of the foreign language. Those structures that are different will be difficult. "... in the comparison between the native and foreign language lies the key to ease or difficulty in foreign language learning."

Fries (1945), who is considered to be one of the most authoritative scholars in contrastive linguistics studies, wrote that the most effective materials are those that are based upon a scientific description of the language to be learned, carefully compared with a parallel description of the native language of the learner.

From what we understand in the above statements, contrastive analysis proponents believe that through description of both systems of the languages (L1 and L2), the areas that might ease learning and/or cause difficulty to the learner would be revealed, and a schedule prepared accordingly would provide the classroom teacher with ready material to make use of in the classroom. Dulay, Burt, and Krashen (1982:97-98), resisting contrastive analysis-based material, present the result of available empirical data that address the CA hypothesis:

1. In neither child nor adult L2 performance do the grammatical errors reflect the learner's L1.
2. L2 learners make many errors of grammar that are comparable in both the L1 and L2 errors that should not be made if "positive transfer" were operating.
3. L2 learners' judgements of the grammatical correctness of L2 sentences are more related to L2 sentence type than to their own L1 structure.
4. Phonological errors exhibit more L1 influence than do grammatical errors, although a substantial number of the L2 phonological errors children make are similar to those made by monolingual first language learners, and only a small portion of phonological errors in reading are traceable to the learner's L1.

The above results may demonstrate that CA not only falls short in predicting learners' errors, but also may mislead teachers into adopting material regardless of the learners' ordering of acquisition of the foreign language. But still, contrastive analysis may have a great deal to contribute, and this contribution is not to be ignored.

Sajavaara (1981) states that the principles constituting contrastive analysis have greatly changed, and it is this change that led to criticisms made about contrastive analysis: "... the theoretical objectives were almost entirely forgotten in the wake of Weinreich's (1953) and Lado's (1957) work," and afterwards, CA tended to concentrate on practical studies of teaching the foreign language, which may later be called "the strong version" of CA, and may be considered as one of the primary causes of "the controversy which ensued in the 1960's." Although cultural interaction and cultural transfer (other than the psychological influence of old habits on L2 : interference) was the other principal objective of CA, its proponents have greatly ignored such, and mainly concentrated on `interference' only. Either with its very limited meaning (as in the transfer of native-language rules to second language) or broad meaning (bilateral transfer of cultural, social norms between languages), interference has often been a moot point that closely concerns second-language acquisition.

In its limited sense, interference incorporates the tendency of transferring of the rules of the learner's native language to the foreign language - this could either be a second or a third language. No matter which language it is, the `lateral' transfer of rules from NL is what constitutes interference.As interference (in contrastive analysis) means the continuity of already-acquired habits of NIL, the learner may tend to revert to NLS (until s/he gets to a certain level of linguistic competence) either in his/her foreign language "receptive skills or productive skills, or both" (Carroll, 1968:113-121). Di Pietro (1971) introduces the terms "convergence" for similarity and "divergence" for diversity, and, thus, he proposes that the learner's errors may result in either tendency. He draws a distinction between transfer and interference suggesting that "the process of interpreting the particular grammar of one language in terms of another is called transfer. The mistakes that result from this process are said to be due to interference." The distinction he draws is quite apparent. When he (obviously) states that mistakes are the outcome of interference and "interference is to be avoided," he also implies that transfer is prior to interference, and that interference can only occur subsequent to transfer. According to this statement, both processes (transfer and interference) can be bilateral; that is, there is no restriction such that the two processes stem from the NL; it could also be the other way around.

Haugen's (1953) approach to linguistic borrowing differs from Lado's in one distinctive point. He defines linguistic borrowing as "an example of cultural diffusion, the spread of an item of culture from people to people." Borrowing is linguistic diffusion, and can be unambiguously defined as language patterns which he has learned in another ... it is the language of the learner that is influenced, not the language he learns. The distinctive point is that, in Lado's statement, it is the foreign language that is influenced rather than the native language; where in Haugen's it is the native language. When the central point is community (language) in Haugen's statement, the central point is the individual in Lado's. Thus, the FL production of the language learner is of primary concern in Lado's. predictions and diagnoses of potential language output (be it grammatical and/or appropriate or deviant) form the basis of language instruction. Such instruction is to take shape with only due consideration given to differences and similarities between FL and NL.

This study seeks to test the contrastive analysis hypothesis in phonology, trying to observe to what extent learners' FL phonemic productions deviate from the 'standard' variety, and if the potential deviancy is indeed attributable to native language influence only. Before proceeding, a brief introduction to both English and Japanese sound systems is presented.

The Japanese writing system is based on a syllabary rather than on a phonetic system. This syllabary is termed in Japanese *go-juuon* 'the fifty sounds'. It is based on five vowel sounds which occur with a number of consonants. Each vowel sound and its accompanying consonant has a separate symbol, termed *kana* [Katakana and Hiragana].[2] Thompson (1990) suggests that the Japanese syllable structure is very simple and that consonantal clusters rarely exist. Thus, the syllabic order in Japanese is generally consonant+vowel, or vowel alone. Thompson maintains that the five vowels in Japanese may distinctively be short or long. The five vowels that form the basic Japanese vowel system are '**a**', '**i**', '**u**', '**e**', and '**o**', and can be observed in all three environments: initial, medial and final.[3]

The Japanese consonants which are also referred to as "nonsyllabics" are sixteen in number.[4] It is worth our while mentioning that in Japanese no consonant is allowed word-finally, except for the syllabic nasal 'n'. For a better picture, below we present Japanese vowels and consonants, and their corresponding counterparts in English in a tabular form. The '√' sign in Table I below indicates the existence of the sound in question in the phonological system of the related language[5].

Table I

Sound Correspondence between English and Japanese					
Vowel	English	Japanese	Consonant	English	Japanese
i	√	√	B	√	√
i:	√	√	P	√	√
u	√	√	M	√	√
u:	√	√	W	√	√
e	√	√	V	√	
ɔ:	√		F	√	
ɒ	√		Ð	√	
ɜ:	√		θ	√	
ʌ	√		D	√	√
æ	√		T	√	√
ə	√		Z	√	√
a:	√	√	S	√	√
a		√	N	√	√
o		√	L	√	
o:		√	ʒ	√	
e:		√	ʃ	√	√
			dʒ	√	√
			tʃ	√	√
			R	√	√
			J	√	√
			G	√	√
			K	√	√
			Ŋ	√	
			H	√	√

According to this tabulation then due to non-existence of some English vowels in Japanese, Japanese speakers may tend to shorten English long vowels which do not exist in their native-language phonological system. They may also be predicted to replace /æ/ with either /e/, /e:/ or /a/; /ʌ/ with a rather open /a/; and /ɒ/ and /ɔ:/ with /o/ or /o:/, these sounds being the closest

counterparts of the vowels in Japanese. The remaining vowels however may not be of significant difficulty, since their correspondents in the NL act as facilitators.

The English consonants, on the other hand, may considerably vary in terms of difficulty level. The main problem such sounds seem to pose for Japanese learners is the unpredictability of the pronunciation of the same character(s) representing different consonants in different environments of lexical terms. Besides such diversity of the English sound system—which may act as a primary cause of error in learners' production—distinct place and manners of articulation of sounds is another phenomenon to have a certain impact on learners' language performance. The English /**r**/, for instance, is a post-alveolar approximant consonant, and it does not exist in final position of lexical items in RP British English.[6] Its presence can only be felt by the prolonged time-onset of the preceding vowel as in car /ka:/. RP, being the type of English usually taught to learners of English, inside and/or outside Britain, learners with Japanese native language background may simply employ the NL /r/ in their English language output, ending up with a voiced alveolar flap /r/.[7]

Final-position /d/ in English, being a devoiced consonant, may prove of some difficulty for learners. Since this sound, for instance, does not occur in final positions of Japanese lexical terms, Japanese learners of English, may either avoid employing it, or articulate it voiced. Similarly, due to their non-existence in the NL, the fricative dentals /ɵ/ and /ð/, may be greatly problem-posing consonants.

The voiceless bilabial fricative English /f/ is a sound that does not exist in Japanese; instead, Japanese has the /h/ phoneme with [h], [ç] and [Φ] allophones; the [Φ] allophone is the closest sound to English /f/, pronounced with the lower lip not touching the top teeth. Based on this comparison, one may predict that the English /f/ is not an easy sound for Japanese speakers. Attempts to articulate this sound may end with a slightly velarized /h/. The English nasal velar /ŋ/, however, has a counterpart in Japanese: the syllabic nasal -n /ŋ/. This should enable learners to produce this sound in English without much difficulty.

The lateral /l/ in English, another missing sound in the Japanese sound system, may cause some articulation difficulty. Learners will probably tend to replace this sound with its nearest counterpart, the alveolar flap /r/.

Despite the contrasts and their potential negative outcomes that were mentioned above, most English consonants find near counterparts in Japanese. In contrast to English vowels, the pronunciation of characters representing the English consonantal sounds in lexical items, in general, is somewhat more predictable than is the pronunciation of characters representing the vowel sounds. Such a statement is, admittedly, overruled by the pronunciation of some characters such as 'c', 'g', 's' and 'x', which normally have various pronunciation renderings, and almost of equal complexity to the pronunciation of vowel characters.

Since the Japanese sound system is strictly represented by specific characters, rendering the sound to be articulated much more predictable than English sounds, *soundwise*, Japanese provides relatively a greater ease for the English speaker learning Japanese than the English

system would to Japanese speakers. To sum up potential English sound difficulties for the learners, based on the contrastive analysis hypothesis, we can predict that learners, in their production of English, should tend to

- articulate English long vowels short; or replace those that do not exist in their native language with potential L1 long vowel sounds;
- face great difficulty with diphthongs and triphthongs; and replace these sounds with L1 long vowels;
- replace the fricatives /θ/ with /t/ and /ts/, and /ð/ with /d/ and /dz/;
- articulate /r/ for /l/;
- finalise every lexical item in a vowel;
- replace /f/ with /h/; and
- produce /b/ for /v/, and /w/ for /v/.

Research Design

In order to observe to what extent our predictions regarding English sound difficulty for Japanese learners are supported by empirical data, a set of 38 sentences[8] including all potential '*problem*' sounds were written and presented to Japanese learners of English to read to a tape recorder. The main objective we tried to observe in the design of the sentences is the phonological properties of words they are to include rather than the words' semantic appropriateness and/or frequency of occurrence in up-to-date English. However, despite this fact, for some words with supposedly low frequency of occurrence, we referred to two sources: (1) Thorndike and Lorge's (1968) work, and (2) Collins Cobuild English Dictionary[9].

The data was collected in the UK (EFL Unit, University of Exeter) and Japan (Dokyo University). The research was conducted under relatively similar conditions for all the subjects who participated in the study, in that the experimenter with a tape recorder in the classroom asked the subjects to enter the room one by one and read the thirty-eight sentences into the tape recorder. The length of each of these sessions took between five to eight minutes per learner. The duration of the experiment was slightly over two and a half hours.

Participants

A total of 18 participants (16 females, 2 males) took part in the study. Ages of the participants ranged between 18 and 29, with an average age of 19. Mean of the total English education they had received was 8 years; and the majority are familiar with at least one language other than English, although the only foreign language they could communicate in well orally and/or in writing was English. Some 13 participants did state however, that they spoke some French. While 9 of the participants attended English language courses at the EFL unit of Exeter University studying English for academic purposes during the academic year of 1991, the remaining participants were from Dokyo University, Japan. All of the participants speak a similar dialect of Japanese, that is the standard language spoken in modern Japan.

Data Analysis and Findings
The data collected from the participants was statistically analyzed. Frequencies of potentially problem sounds were calculated for each sound environment, that is intial, medial and final, and a t-test was carried out for statistical significance of sound replacements. P≥0.05 will be the value to be observed when interpreting statistical significance of the sound replacements. Overall, twenty-three English sounds were observed to cause some kind of difficulty (minor or major) for learners. For all the twenty-three desired sounds, forty-seven replacing sounds were recorded, and presented in Table II below. In the table, the "√" sign represents the observed sound replacement.

Table II

Desired Sound	Produced Sound	Initial	Medial	Final
d	T			√
z	S			√
z	Ts			√
w	V	√	√	
ð	D	√	√	√
ð	Z	√		√
ð	T			√
ð	θ			√
ð	S			√
θ	T	√	√	√
θ	S	√	√	√
θ	Z	√		√
ŋ	Nk			√
v	F			√
v	W	√		√
b	P			√
f	H	√		
ʃ	S	√	√	√
ʃ	tʃ	√	√	√
tʃ	T		√	√
l	R	√	√	
r	L	√	√	
æ	A	√	√	
æ	A:		√	
æ	E	√	√	
æ	Ei		√	
e	E:		√	
e	I	√	√	
e	i:		√	
i	i:		√	

i:	I	√	√	
ə	E	√		
ə	A	√		
ə	O	√		
əu	O	√	√	
əu	U		√	
əu	o:	√	√	
əu	u:		√	
ɒ	O	√	√	
ɒ	o:	√	√	
ʌ	a:		√	
ʌ	A	√	√	
ʌ	æ		√	
ʌ	U		√	
ɔ:	O		√	√
ɔ:	o:		√	√
u:	U		√	√

According to what we can observe in the table, most of what was predicted by the contrastive analysis hypothesis did indeed emerge in the production of the FL learners. English long vowels were produced short; one major replacing sound of the /əu/ diphthong was a long vowel; fricatives such as /θ/ and /ð/ did lead to major production difficulty being replaced with NL counterparts; the /r/-/l/, /f/-/h/, /w/-/v/ contrasts were other phenomena to be observed in the learners' language output. However, as predicted, learners did not finalize words with consonants with vowels nor did they produce /b/ for /v/. From a statistical analysis point of view, the only statistically significant replacements were observed to be /əu/ with /o/ and /ɒ/ with /o/ (both word-initially) where the t-test results respectively are p=0.331 and p=0.110. For all other replacements, the t-test revealed insignificant results: p=0.000.[10] Below, we will deal with each kind of sound replacement and present potential interpretation of deviancy from the target language.

In Table II above, the /d/ phoneme was observed to have been replaced with /t/ in word-final position only. This phoneme in both word-initial and word-medial positions does not seem to pose Japanese learners any problem in pronunciation; because both the /d/ and /t/ phonemes appear in these two positions, learners' tendency to produce /t/ for /d/ in word-final position can be attributed to markedness theory principles in phonology. Likewise, /z/ was replaced with /s/ in word-final position only. The replacements regarding this phoneme were observed to have stemmed from spelling difficulties. Replacements with /ts/, however, seem to have occurred from allophonic variations in Japanese.

Although, /v/ does not exist in Japanese origin lexical items, learners were observed to replace the /w/ phoneme in English with /v/ in both word-initial and word-medial positions. These replacements can be ascribed either to a language training strategy Selinker (1972;1978) or to the

fact of incorporation of the /v/ phoneme into Japanese phonological system—a most novel contribution that was given official status in early 1992[11]. On the other hand, the /v/ phoneme itself was replaced with /w/, and /f/; while replacements with /w/ appeared in both word-initial and word-final positions—and were attributed to native-language influence—replacements with /f/ were observed to be word-specific, and were believed to have stemmed from spelling difficulties.

Two major difficulty-causing sounds for Japanese learners were observed to be the /θ/ and /ð/ phonemes. The former received replacements with /t/, /s/, and /z/. Word-initial and word-medial replacements of this sound were found to be relatively more significant than word-final-position replacements, which all can be attributed to activation of the voice factor as well as native-language influence. The /ð/ phoneme, however, was mainly replaced with /d/ in word-initial position and to some small degree, with /z/; in word-medial position, with /d/ only, and in word-final position, to a great extent, with /t/, /s/, and /θ/. Replacements with /d/ and /z/ were observed to occur to a relatively small degree. We can suggest that word-initial and word-medial replacements reflect native-language influence, replacements of word-final position, on the other hand, were mostly attributed to the dominance exerted by the voice factor.

Japanese has the /ŋ/ phoneme in word-final position of its lexical items. As is predicted, this sound was found not to pose Japanese learners any serious difficulty. However, we could observe some replacements having been made with /nk/. Such rather small diversity of learners could be explained by (1) native-language transfer of spelling rules, and (2) a markedness theory approach, that is production of a less marked phoneme sequence in place of a relatively more marked one.

We see that the /b/ phoneme was produced perfectly well in both word initial and word final positions. However, in word-final position it was significantly replaced with /p/. The only plausible interpretation of such language behaviour seems to be reliance on markedness theory principles, where [-voiced] phonemes appear to be easier to produce than [+voiced] counterparts.

The /ʃ/ phoneme was replaced with /s/, and /tʃ/ in all three positions. Replacements with /s/ are attributed to transfer of internal changes in the phonological system of the native language. Replacements made with /tʃ/, though insignificant, were ascribed to a supposed higher frequency of occurrence of sounds. /tʃ/, on the other hand, was replaced with /t/ in word-final position only. Replacements of this sound can be attributed to a type of target-language-based strategy that involves the reduction of phonological complexity of some particular sounds.

The /l/ phoneme was observed to be replaced with /r/ in all three positions, albeit word-medial-position replacements significantly outnumbered other type of replacements. This language behaviour of learners was attributed to a direct native-language transfer. Since most of /l/ occurrences in word-final position were omitted, replacements prove to be a rather small number. We may analogise such tendency of learners with a target-language-based omission strategy. Conversely, /r/—the only liquid in the language—was replaced with /l/. This can be ascribed to a training strategy which overemphasises the production of the /l/ sound due to its non-existence in the native language.

The /æ/ phoneme was replaced with /a/, /a:/, /e/, and /ei/. The replacements with /a/, and /e/ occurred in both word-initial and word-medial positions, and were observed to have a significant status, whereas replacements with /a:/, and /ei/ took place in word-medial position only, and were recorded to be a rather small number. Due to non-existence of this sound in the standard phonological system of Japanese, some of these replacements were attributed to an inter-lingual transfer, and some to an intralingual-based strategy that involves the overgeneralisation of a commonly employed pronunciation of particular spelling characters.

We can also see replacements of /e/ with /e:/, /i/, and /i:/; /i/ with /i:/; /i:/ with /i/; and /ə/ with /e/, /a/, and /o/. While most of the observed replacements are attributed to a target-language-based, overgeneralisation strategy, some other replacements are believed to have stemmed partly by native-language-influence, and partly from a type of language training strategy.

The /əu/ phoneme was replaced with /o/, /u/, /o:/, and /u:/. While most of the replacements were interpreted in terms of native-language influence, some were believed to have stemmed from an intralingual strategy which involves phonetic complexity of some particular spelling characters.

The /ɒ/ phoneme was replaced with /o/, and /o:/. Replacements that were made with /o/ were observed to be direct resultant from native-language influence, whereas, replacements with /o:/ were believed to reflect a target-language-based spelling difficulty, as well as native-language influence.

The /ʌ/ phoneme was replaced with /a:/, /a/, /æ/, and /u/. While the replacements made with /a/ reflect inter-lingual-based phonological transfer, replacements with /u/ are believed to have occurred from direct spelling difficulty that may be attributed to native-language influence. Replacements with /a:/ were thought to have occurred from a target-language-based pronunciation strategy—as well as some L1 influence—while replacements with /æ/ reflect an internal change that is in progress in the native language.

The /ɔ:/ phoneme was replaced with /o/, and /o:/. Both types of replacements were observed to have occurred from a native-language influence—while replacements with /o/ reflect direct transfer, replacements with /o:/, on the other hand, were attributed partly to native-language, and partly to a target-language-based strategy. Finally, the /u:/ phoneme was replaced with /u/. The replacements that occurred here were observed to reflect a universally occurring phonemic shrinkage strategy.

Conclusion
It is a fact that transfer occurs less frequently in other domains of language than it does in phonology. And it is true that an L2 speaker may attain an absolute command of the L2 syntax and semantics, yet fail in attaining the same skill in phonology—as in the case of the famous British author of Polish origin, Joseph Conrad.[12] This shows how our NL deep-rooted knowledge may deeply influence our language learning faculty, and how this knowledge can assert itself in even simple situations of our TL production; it all depends on the intensity of the transfer process whether our phonological utterances, for instance, are intelligible or not to the native speaker.

In this study the most common strategy that was observed to be followed by language learners is the interlingual strategy, i.e. L1 transfer. This finding supports the contrastive analysis hypothesis. Apart from that, learners also referred to intralingual strategies such as overgeneralisation, reduction of complexity, and avoidance, all of which cannot be explained by solely relying on contrastive analysis, and seem to have more of a universal nature.

Learners were also observed to render phonemic variations that resulted from factors other than pure differences between the phonological systems of the NL and the TL. For instance, sociolinguistic factors were observed. Preceding the /i/ phoneme the Japanese /s/ is produced as /ʃ/. Yet, in the collected data learners (females only) were observed to produce /s/ instead. Phonologically there is no need for that. Later, as research was intensified, it was found out that this type of pronunciation in Japanese among female speakers in particular is an indication of politeness. This sociolinguistic feature in Japanese obviously had a significant (though not statistically, p=0.000) impact on learners' phonological productions in English.

Another feature was the production of /æ/ for /ʌ/. Since /æ/ does not exist in Japanese—at least not in the recorded Japanese phonological repertoire—we could not initially attribute such replacement to NL. Yet, as is stated by Hinds (1986), Japanese speakers may be displaying a trend of rendering /æ/ for the **'a'** spelling character in Japanese. Such an internal change of the NL, regardless how minor it may be, is obviously significant in influencing L2 learners' phonological output in English

From a language teaching point of view, the results obtained from this research provide significant material for the English language teacher to rely on in teaching English phonology to learners who have affiliation with Japanese. From the empirical findings, the teacher may thus draw the following conclusions:

- Learners face difficulty with the devoiced English /d/. The fact that neither /d/ nor the replacing /t/ exists word finally in Japanese enhances the assumption that most English words that end in /d/ will be terminated with /t/. The teacher should give considerable attention to this point.
- Like the /d/ phoneme, /z/ also poses learners some difficulty of production in word-final position. The difficulty arises when this phoneme is represented by the 's' spelling character; this mainly occurs when pluralisation, possession and tense marking are involved. The situation being so, the teacher should therefore help learners to identify the pronunciation of 's' in its versatile functions in English words.
- Both /θ/ and /ð/ are sounds that pose major difficulty. Learners should receive intensive training in articulation of these sounds.
- The /v/ and /f/ phonemes do not seem to cause significant difficulty, probably owing to the fact that both sounds are presently employed in loan words from western languages, and are represented in Hiragana script through newly devised symbols. The teacher should no longer worry about these sounds.
- Yet, /l/ and /r/ still remain to be as difficulty-posing sounds. Pronunciations such as /r/ for /l/ and vice versa should not surprise the teacher. These are some of those sounds that can be mastered by effort and time.

- The teacher should also be prepared to hear pronunciations such as /s/ for /ʃ/, particularly among female learners. With this pronunciation, the learner (in their NL) expresses politeness. As was also observed in this study, this sociolinguistic rule can be applied in L2 as well. Learners should be made aware of the difference between two languages.
- An on-going internal change in Japanese may in the future lead to significant pronunciation problems in the articulation of the English /ʌ/ and /a:/, resulting in /æ/ for both. This type of replacement was observed with /ʌ/. This is due to the fact that, as was suggested by Hinds, there is a trend among Japanese to produce the Japanese /a/ as /æ/. Consideration of this possibility is advisable. All other English vowels seem to pose learners varying degree of some difficulty.

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[1] For further studies on the Interference Theory and Language Transfer, see Haugen (1953), Carroll (1968), Di Pietro (1971), Corder (1973;1982), Brown (1980), and James (1980).

[2] See Hinds (1986).

[3] See Miller (1967)

[4] The two vowel-functioning semivowels, 'w' and 'y' are not included.

[5] For a comprehensive list of English sounds, see Ladefoged (1975), Roach (1991), and Underhill, (1994).

[6] However, a great variety of British accents such as those employed in West of England, Wales, Scotland, and Northern Ireland, do pronounce this sound in word-final; the sound in this word position this sound is also articulated in many American accents.

[7]***Flap,*** as is defined by Crystal (1991:138), the articulator which makes the contact returns to a position of rest, and the contact resembles a very rapid stop articulation.

[8] 1. Matthew lay in bed leaving the door off the latch.
2. His jaws creaked as he chewed the gum.
3. That piece of cloth is very thin.
4. With a bit of luck the gull escaped the shot.
5. We lack space in the lab.
6. Charles is a bad time keeper.
7. Don't thrust the food into your mouth, you cannot breathe.
8. The glue is in the cup, near the mats.
9. I bet he will come back just in time.
10. Throw that tin into the bin, please.
11. We were led into chaos by him.
12. I loathe that heavy load on my back.
13. I think we must trust him when it comes to cashing cheques.
14. The horse came back in a lather.
15. That shoulder pad will crumple easily.
16. Catching up with Tim in maths must be quite difficult for Jon.
17. Don't let him lash the horse.
18. We will bathe the cub, and then put it back in its den.
19. His job at the restaurant is mashing potatoes only.
20. He didn't have the wit to bid a lower price for this vase.
21. Your share is on the chair, dear.
22. Crumble the bread, and then put it in the bag for the ducks.
23. He will lag behind with his bruised shin.
24. The latter clue sounds more reasonable.
25. Frank sat down with his bat in his lap.
26. I bade farewell to my hometown.
27. I am fed up with this din.
28. I will need some cash for such a valuable catch.
29. Don't dip the bread into your food, please.
30. I bought a dress and a matching scarf.
31. Take that pin off the desk, please.
32. Don't exceed the dose.
33. He came late to the game.

34. Jim died because a blood clot entered his heart.
35. Let's give the baby a bath.
36. They breed goats on this farm.
37. Can you fetch me the ladder, please?
38. I have his name on the tip of my tongue.

[9] A frequency of occurrence for some words which appeared in the sentences, as indicated by Thorndike and Lorge (1968), is: for **bin** 6 occurrences per million words in general texts, **pin** 43, **pad** 17, **crumble** 12, **crumple** 7, **lab** 16, **cub** 11, **clue** 4, **glue** 15, **gum** 11, **lag** 9, **tin** 36, **din** 11, **ladder** 19, **bet** 23, **dose** 8, **den** 23, **lather** 2, **breed** 19, **loathe** 7, **thrust** 40, **tin** 36, **maths** 8, **mats** 18, **clot** 2, **bat** 19, **wit** between 50 and 100, **shin** 5, **latch** 8 **lash** 22. Collins Cobuild's indication of frequency band is however through tagging words with diamond shaped symbols; thus, the more frequently a word is used, the more filled-up diomands it is to have; words with highest frequency are of 5 diamonds and those with lowest frequency have none. Accordingly, for **bin** 2 diamonds, **pin** 3, **pad** 2, **crumble** 2, **crumple** 1, **lab** 2, **cub** 1, **clue** 2, **glue** 2, **gum** 2, **lag** 2, **tin** 2, **din** 1, **ladder** 2, **bet** 3, **dose** 2, **den** 1, **lather** 0, **breed** 3, **loathe** 1, **thrust** 2, **tin** 2, **maths** 1, **mats** 1, **clot** 1, **bat** 3, **wit** 2, **shin** 1, **latch** 1 **lash** 2 ("Collins Cobuild English Dictionary", 1995).

[10] For percentages, see the table below:

Sound	I.O	I.P	%	M.O	M.P	%	F.O	F.P	%	T.O	T.P	%
d-t	306	-	-	72	-	-	432	273	63.2	810	273	33.7
z-s	-	-	-	54	-	-	432	141	32.6	486	141	29.0
z-ts	-	-	-	54	-	-	432	5	1.2	486	5	1.0
w-v	306	23	7.5	36	4	11.1	-	-	-	342	27	7.9
ð-d	702	622	88.6	18	16	88.9	144	9	6.3	864	647	74.9
ð-z	702	10	1.4	18	-	-	144	10	6.9	864	20	2.3
ð-t	702	-	-	18	-	-	144	44	30.6	864	44	5.1
ð-θ	702	-	-	18	-	-	144	21	14.6	864	21	2.4
ð-s	702	-	-	18	-	-	144	23	16.0	864	23	2.7
θ-t	72	21	29.2	36	11	30.6	54	2	3.7	162	34	21.0
θ-s	72	15	20.8	36	6	16.7	54	4	7.4	162	25	15.4
θ-z	72	1	1.4	36	-	-	54	5	9.3	162	6	3.7
ŋ-nk	-	-	-	-	-	-	108	6	5.6	108	6	5.6
v-f	54	-	-	36	-	-	108	83	76.9	198	83	41.9
v-w	54	2	3.7	36	-	-	108	6	5.6	198	8	4.0
b-p	486	-	-	72	-	-	54	50	92.6	612	50	8.2
f-h	198	2	1.0	54	-	-	18	-	-	270	2	0.7
ʃ-s	72	12	16.7	36	15	41.7	36	4	11.1	144	31	21.5
ʃ-tʃ	72	1	1.4	36	1	2.8	36	1	2.8	144	3	2.1
tʃ-t	72	-	-	36	2	5.6	72	6	8.3	180	8	4.4
l-r	342	19	5.6	252	57	22.6	198	17	8.6	792	93	11.7
r-l	36	3	8.3	288	10	3.5	18	-	-	342	13	3.8
æ-a	36	3	8.3	684	156	22.8	-	-	-	720	159	22.1
æ-a:	36	-	-	684	29	4.2	-	-	-	720	29	4.0
æ-e	36	30	83.3	684	242	35.4	-	-	-	720	272	37.8
æ-ei	36	-	-	684	3	0.4	-	-	-	720	3	0.4
e-e:	18	-	-	360	30	8.3	-	-	-	378	30	7.9

	I.O	I.P	%	M.O	M.P	%	F.O	F.P	%	T.O	T.P	%
e-i	18	4	22.2	360	1	0.3	-	-	-	378	5	1.3
e-iː	18	-	-	360	4	1.1	-	-	-	378	4	1.0
i-iː	414	-	-	756	40	5.3	288	-	-	1458	40	2.7
iː-i	18	10	55.6	216	38	17.6	-	-	-	234	48	20.5
ə-e	288	149	51.7	306	-	-	756	-	-	1350	149	11.0
ə-a	288	60	20.8	306	-	-	756	-	-	1350	60	4.4
ə-o	288	48	16.7	306	-	-	756	-	-	1350	48	3.6
əu-o	18	17	94.4	198	144	72.7	18	-	-	234	161	68.8
əu-u	18	-	-	198	4	2.0	18	2	11.1	234	6	2.6
əu-oː	18	2	11.1	198	43	21.7	18	-	-	234	45	19.2
əu-uː	18	-	-	198	4	2.0	18	-	-	234	4	1.7
ɒ-o	108	101	93.5	162	84	51.9	-	-	-	270	185	68.5
ɒ-oː	108	1	0.9	162	12	7.4	-	-	-	270	13	4.8
ʌ-aː	36	-	-	342	49	14.3	-	-	-	378	49	13.0
ʌ-a	36	11	30.6	342	96	28.1	-	-	-	378	107	28.3
ʌ-æ	36	-	-	342	12	3.5	-	-	-	378	12	3.2
ʌ-u	36	-	-	342	4	1.2	-	-	-	378	4	1.1
ɔː-o	-	-	-	90	47	52.2	144	131	91.0	234	178	76.1
ɔː-oː	-	-	-	90	34	37.8	144	4	2.8	234	38	16.2
uː-u	-	-	-	72	5	6.9	36	23	63.9	108	28	25.9

In the table above, the first sound in the first column is the desired sound, the second is the one produced by the learners instead; I.O stands for the sound occurring in initial position; I.P for the sound produced in initial position; M.O for the sound occurring in medial position; M.P for the sound produced in medial position; F.O for the sound occurring in final position; F.P for the sound produced in final position; T.O for the sound occurring in all positions; T.P for the sound produced in all positions; and % for the sum of produced sound in percentage when compared with the sum of occurring sound.

[11] For further information, the reader is referred to a publication of National Japanese Research Institute dated 1990 and titled "Gairaigo no Keisei to Sono Kyoiku" (The Formation of Loan Words and Their Teaching), Tokyo. A second source that would prove helpful is Wakabayashi's (1991) article titled "Eigo Kyoiku Nisshi" (The English Education Diary) included in the English teachers' magazine *Eigo Kyoiku*, vol. 40, No. 8, pp. 90-93. Tokyo: Taishukan.

[12] See Lucas, 1998.