

A Proposal for a Simplified Vowel System of English with Special Reference to the *Cot-Caught* Merger

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Introduction

The vowel inventory of the English language, which comprises far more phonemes and allophones than that of Japanese, is one of the most difficult aspects of English for Japanese students. In this article, I will propose a ‘reduced’ vowel inventory containing a smaller number of sounds than are commonly presented in the classroom. Devising such a simplified system would be possible because the exact number of vowels used by a native English speaker varies from dialect to dialect and even individually, making it feasible to ‘pick’ vowel phonemes and allophones and put them together into a pedagogically motivated vowel system that is not unrealistically different from any of the natural vowel inventories.

Vowel systems of English

English has an extremely complex vowel system. Any discussion of geographical English varieties tends to focus on which vowel phonemes and allophones should be recognized in a given dialect. From a pedagogical point of view, it is important to familiarize our students with the ‘chaotic’ situation involving English vowels. A few words from Walker (2015), who advocates teaching ELF, or English as a lingua franca, make this point clear:

Any treatment of vowel quality for ELF should begin by raising learners’ awareness as to the extent of variation in vowel quality among native speakers. (Walker 2015: 84)

The ‘variation in vowel quality’ does not necessarily pose a problem for learners, because it implies that there does not exist any definite English vowel system that should be taught in the classroom. This instead means that the teacher has the freedom to choose any vowel system from among those used by native speakers around the world and present it as a model system for his students to study. To advance this line of argument even further, one can assemble a vowel system that consists of sounds each selected from different natural vowel systems of English. A vowel inventory created this way would be an artificial system but would not be so unnatural, given the fact that there is such a great extent of vowel variation in English dialects that no native speaker is familiar with the whole picture.

An advantage for Japanese teachers of English

The task of assembling a pedagogically motivated vowel system should start by considering the vowel system of our students' native language, i.e. that of Japanese, as is suggested by Walker (2015):

Teachers can deliberately use the learner's mother tongue pronunciation to help learners to attain a good command of the features in the LFC¹⁾. (Walker 2015: 66–67)

Use the mother tongue vowel system as your starting point and extend this to include other qualities that learners can easily produce. (ibid.: 84)

Based upon my personal experience as a learner as well as a teacher, Japanese students, whose native language has only five vowels, often find dealing with the vowel variation of English a daunting task. They may even feel inferior to native English speakers about not being able to distinguish the qualities of English vowels. Such students should be reminded of the fact that the five-vowel inventory of Japanese is not unlike that of such major languages as Latin, Spanish, and Italian. It would be a great encouragement for them to know that Latin, one of the most prestigious languages in human history, shares a five-vowel system which is almost identical to the Japanese system. It may be even argued that the Japanese simple vowel system is more streamlined and fundamental than the more complex system of English. Indeed, as Prator and Robinett (1985: 11) observes, “the fundamental vowel sounds, those that occur in many languages, are / iy /, / ey /, / a /, / ow /, and / uw /”. Note that the one monophthong and four diphthongs mentioned here roughly correspond to Japanese /イ/, /エ/, /ア/, /オ/, and /ウ/. It should also be pointed out that the Roman Alphabet has only five letters to represent vowels; namely *a*, *i*, *u*, *e*, and *o*, and therefore, there is nothing wrong or defective about a five-vowel system.

The five vowels characterized as fundamental by Prator and Robinett are, as is illustrated by the following chart in Figure 1, located in a rather organized manner around the mouth; two of them are front vowels and two are back, while two are high and two are mid vowels. The teacher should show this type of chart to their Japanese students and tell them how well-organized their native vowel system is. Knowing that the Japanese vowel system is in no way inferior to the English system but is simply different should make the students more confident and help them enjoy learning the English system.

My proposal for constructing an artificial vowel system is somewhat similar to the “assimilated *kana* representation system (近似カナ表記システム)” put forward in Shimaoka (1994), where he argues for using modified versions of *katakana* to represent English pronunciation. My system, however, would not use *katakana* to represent English sounds because syllabic symbols like *katakana* would make it difficult for learners to separate vowels and consonants as distinct entities and would allow unnecessary vowels to occur where they should not.

1) Lingua Franca Core

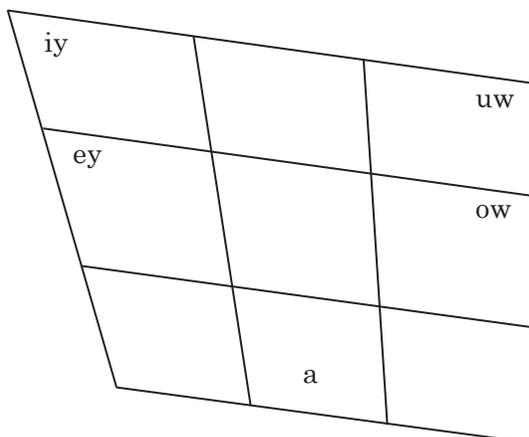


Figure 1 The five fundamental vowels²⁾.
(adapted from Prator & Robinett 1985: 11)

An attempt to assemble a sound system featuring elements of the learners' mother tongue would definitely require the teacher to be familiar with the learner's native language. A native Japanese speaker should be a better English teacher in this regard because "teachers who share the learners' first-language background have an advantage over their colleagues who do not (Walker 2015: 67)," and "a non-native speaker teacher of English understands the physical and psychological difficulties in acquiring a second pronunciation (ibid. 68)."

The *cot-caught* merger

The pedagogical vowel system to be assembled here will be based upon that of American English because this particular variety of English seems to be a dominant feature in the foreign language experience of most Japanese students. While numerous subsets of American English and their characteristics have been recognized and examined, one conspicuous phonemic phenomenon that deserves attention is the so-called *cot-caught* merger, whereby the vowel /ɑ/ of the *cot* class words and the vowel /ɔ/ of the *caught* class have merged into /ɑ/.

Interestingly, this merger seems to be reflected in the pronunciations of the word *god* as spoken by the average Japanese speaker. While the word is commonly transcribed and pronounced as ゴツド in Japanese with the vowel /オ/³⁾, it is transcribed and pronounced as ガツド with the vowel /ア/⁴⁾ when it

2) The vowel chart is originally adapted from John S. Kenyon, *American Pronunciation*, 10th ed. (Ann Arbor: George Wahr Publishing Company, 1958)

3) For those who are not familiar with the Japanese phonetic lettering system, ゴ is a syllabic symbol for the combination of [g] and [o], while オ roughly corresponds to [o].

4) ガ is a syllabic symbol for the combination of [g] and [ɑ], and ア approximately corresponds to [ɑ].

is incorporated in the phrase “Oh, my god!”; オー、マイ ガット. One can account for this variation by assuming that ゴット is a reflection of /gɔd/, while ガット reflects /gɑd/.

The merger has been discussed quite extensively in the literature. Olive et al. (1993), for example, offer the following observation:

The distinction between the vowels of *cot* and *caught* is not maintained in all regional dialects. Both words are pronounced [ɑ] by some speakers. (Olive, Greenwood, & Coleman 1993: 364)

The merger is in addition to yet another merger between /ɒ/ and /ɑ/. The process of the three vowels /ɒ/, /ɑ/, and /ɔ/ merging into /ɑ/ is so complex and elusive that it is neither possible or relevant to elaborate on it here. The following quotation from Thomas (1958) gives some idea of how complicated the whole process is:

... a large group of words in which *o* precedes a voiceless fricative or a nasal, as in *off*, *toss*, *soft*, *broth*, *long*, and *gone*. Here, the usual American vowel is [ɔ]. In western Pennsylvania, however, and occasionally in eastern New England, western New York, the Mormon country, western Canada, and sporadically in other areas, one may frequently hear [ɒ]. In western Pennsylvania, the shift may go as far as [ɑ] in such words as *off* [ɑf], *lost* [lɑst], *long* [lɑŋ], *law* [lɑ], *office* [ɑfɪs], and *coffee*. [kɑfi]. (Thomas 1958: 119)

Determining the definite geographic distribution of the merger seems elusive with different observers citing different regions. As is suggested in the above quotation, it is often associated with regional varieties of American English. Orion (1997) writes:

/ɔ/ as in “all” may be replaced by /ɑ/ as in “not” in some words, depending on which dialect of American English you hear. (Orion 1997: 147)

Carr (1999: 163) cites parts of Canada, Utah, Nevada and Pennsylvania, while Makino (2005: 45) points out that “in two thirds of the western United States, it is usually the case that the pronunciation of /ɔ/ has lost its lip-rounding and become identical to /ɑ/.”

In the dialects where the merger of the three vowel phonemes is complete, /ɑ/ may suffice as a “one-fit-all” vowel for the three word classes involved as the following remarks by Cruttenden (2001) about General American English (GA) suggest:

... for an increasing number of GA speakers (and most Canadians), not only do RP /ɒ/ and /ɑ:/ fall together but /ɔ:/ also falls in with this group: for such speakers *cod*, *calm*, and *cause* will have the same vowel. (Cruttenden 2001: 85)

One important fact about the *cot-caught* merger is that it does not usually apply to a syllable that ends with / r /. It is often the case that even in a *cot-caught* merged dialect, words such as *door* and *more* retain the vowel / ɔ /; hence / d ɔ ə / and / m ɔ ə /, not / d ə ə / or / m ə ə /. As Takebayashi and Saito (2008: 54) observe, the articulatory location of / ɔ ə / varies extensively in American English, and, therefore, “it would cause no practical inconvenience whatsoever if one substitutes the Japanese オア.”⁵⁾ / ɔ / also occurs in the diphthong / ɔ ɪ /, but the starting point of the diphthong is not so different from that of Japanese オイ (Takebayashi & Saito 2008: 44), so it would not cause much trouble to substitute the first element of the diphthong with オ.

To sum up the argument thus far, a pedagogically motivated vowel inventory of English could probably be constructed without / ɔ / and still be functional enough for practical purposes. In fact, the idea of removing this vowel altogether from a phoneme system to be taught in the classroom is suggested by Makino, who mentions that this merger “tends to spread even further, so it may not be absolutely necessary to learn / ɔ /”⁶⁾ (Makino 2005: 45). Echoing this view, Misono observes that “the merger of [ɔ :] and [ə] to [ə] makes the number of vowels less by one” (Misono 2007: 76).

How / ə / should be taught

If we allow the vowel / ə / to take the place of / ɒ / and / ɔ /, it would be crucially important for the student to learn how to pronounce / ə / correctly. This would be a relatively easy task. Because / ə / is located at the bottom, rightmost corner of the vowel chart (i.e. an extreme position), the articulatory configuration of the mouth for the vowel can be described in simple terms. Consider the following description:

/ ə / is THE LOWEST of the back vowels. The mouth is open wider for this vowel than for any other. The lips are neutral, neither spread nor rounded, and the entire tongue is low and lax.
(The emphatic capitalization is in the original text) (Bronstein 1960: 162)

Bronstein’s description leads to a rather simple prescription for the learner; to pronounce the vowel / ə /, the speaker should only drop the lower jaw as far down as possible with the tongue and the lips relaxed. The extreme (i.e. distinct) characteristics of the vowel make it an easier sound to make than such ‘less extreme’ vowels as / ɪ / and / ʊ /, whose descriptions would be more elusive.

For those students who find articulatory descriptions too difficult, a more intuitive direction would prove useful. Orion’s (1997: 80) characterization of / ə / as “the sound the doctor asks you to make

5) The original Japanese text: 日本語の「オア」を代用しても実際にはなんなら不都合はない。

6) The original Japanese text: さらに広まる傾向にあるため、強いて / ɔ / の発音を学ぶ必要はないかもしれない。

when he or she examines your throat” might work better for such students.

[ʌ] and [ə] as allophones of / ə /

It is a long-established tradition to regard [ʌ] and [ə] as distinct phonemes. [ʌ] is typically characterized as “A CENTRAL LOW unrounded vowel (Bronstein 1960: 174)⁷⁾” and associated with “a reasonable degree of stress (ibid.)” [ə], on the other hand, is often referred to as ‘schwa,’ and described as “the most representative weak vowel (Takebayashi & Saito 2008: 67)⁸⁾” It is usually assumed that the latter vowel occurs only in an unstressed syllable.

However, you can find a few sources where the two sounds are represented by the same symbol ə. For example, Orion (1997) has the following to say:

The vowel sound / ə / as in “up” is spelled different ways in the following list of words. Sometimes it is stressed, and sometimes it is unstressed. (Orion 1997: 133)

And she provides examples of words that have [ə] in a stressed syllable (e.g. *some, fun, study*, and *Monday*) and others in which [ə] occurs in an unstressed syllable (e.g. *arrive, diet*, and *soda*). In Orion’s system of transcription, the vowel that would be represented as / ʌ / elsewhere is simply a stressed allophone of / ə / and is expressed as the same symbol.

Prator and Robinet (1985: 5–7) also integrate / ʌ / and / ə / into / ə /, transcribing both *sun* and *son* as / s ə n /, *but* as / b ə t /, *other* as / ə ð ə r /, and *ago* as / ə g ə w /⁹⁾.

Wells (1982) seems to be favorable to the allophonic treatment of / ʌ / and / ə / as he writes:

... in GenAm it may well be considered that stressed [ʌ] and unstressed [ə] are co-allophones of one phoneme. (Wells 1982: 132)

Moulton(1990) notes that this kind of “double use of / ə / is widespread among American dialectologists” because “the vowels of *above* have approximately the same height in American English”(Moulton 1990: 133).

Assuming the legitimacy of all these observations, I believe that offering a vowel inventory without / ʌ / would be a good idea to make the task of mastering English vowels much less demanding for Japanese students.

7) The capitalization is in the original text.

8) The original Japanese text: 最も代表的な弱母音

9) I omitted stress symbols for a technical reason.

How / ə / should be taught

In order to make the vowel sound of / ə /¹⁰⁾, the speaker does not have to do much. This is a kind of sound that is produced correctly when the articulatory organs stay idle, doing nothing in particular. Consider Bronstein's(1960) description below:

It has no such definite position of the articulators as can be noted for any other sound. It is probably best described as a sound made with the articulators in neutral position with neither spread nor rounded lips, and with the tongue neither forward or back. (Bronstein 1960: 179)

Here the teacher's job is not to make his students do something, but rather, to dissuade them from making a deliberate effort. My favorite method in the classroom is to remind my students of the shape of their mouth when they are extremely tired both physically and mentally. I often tell them to pretend that they are fed up with everything in their life and make the vowel sound as if they 'let out a sigh of exhaustion.'

The subtle change in distinctness between a stressed / ə / and an unstressed / ə / would be caused by adjusting the degree of 'exhaustion.' When the speaker pretends to be less exhausted, the articulators will be aligned accordingly for slightly more defined sound quality.

Vowels similar to イ

There are two English vowel monophthongs that are similar to Japanese イ; / i / and / ɪ /. The quality of / i / is very close to that of Japanese イ. Kamiyama(2008: 90)¹¹⁾ tells us that the sound is "extremely similar to the Japanese long vowel イー, and poses no problem for Japanese speakers." The student, however, should be reminded that a relaxed glottis is an essential feature of the English counterpart since Japanese speakers tend to put a glottal stop after a vowel.

The pronunciation of / ɪ / would be a bit more problematic. In order to make this sound, the student has to lower the tongue slightly from the height of / i /. My experience as a learner has convinced me that a deliberate effort to lower the tongue would be counterproductive, for the resultant sound would be too tense. My favorite method to teach / ɪ / is to pull a rubber band horizontally with both hands to demonstrate the shape of the lips for / i /, and then release the band to let it slacken for / ɪ /.

10) We do not use the term 'schwa' for the sound here because the term is usually employed to refer to the vowel only when it occurs in an unstressed position.

11) The original Japanese text: 日本語の長母音イーに極めて近く、日本語話者には何の問題もありません。

Vowels similar to ウ

The tense vowel / u / and its lax counterpart / ʊ / are the two English vowels similar to Japanese ウ. To pronounce / u /, one should start from the shape of Japanese ウ. The lips then should protrude forward while being rounded. The protrusion and roundedness of the lips make it an easy sound to demonstrate in the classroom.

The articulation of / ʊ / can be achieved by modifying / u /. You should first make the sound of / u /, which is a very tense vowel, and then slacken the lip muscles to let them revert to the neutral relaxed position. As is the case with / ɪ /, a deliberate effort to make this sound would end up with an unnatural tense vowel. If a student has trouble with this vowel, he should be allowed to substitute / u / for it. According to Wells (1982: 133), “Scottish and Ulster accents have no phoneme / ʊ /, the FOOT vowel having merged with that of GOOSE.”

Vowels similar to エ

The English phoneme / e / is so close to Japanese エ that it is not a big problem for Japanese speakers. The English vowel, however, may be slightly more relaxed than エ, so “it might be better if you open your mouth in a slightly sloppy manner (Kamiyama 2008: 91)¹²⁾”

Vowels similar to オ

I have already suggested in a previous section that we can remove the phoneme / ɔ / from our system and replace it with / ɑ / in most positions and with the Japanese vowel オ in a position followed by / r /. The phonetic symbol ɔ has caused great confusion among learners due to the dialectal variability of the vowel that it represents. I believe a sound system without it would be a legitimate option for English learners who have difficulty in handling a large vowel inventory.

/ æ /

The symbol æ is the combination of a and e, which suggests that its sound quality is halfway between those of / a / and / e /. While I don't have any novel, eye-opening teaching method for this particular vowel, one important fact about its distribution might help clarify any confusion some students might be experiencing: the vowel is replaced by / e / when it is followed by / r / in some dialects. In a dialect where this rule applies, *marry*, which is pronounced [m æ r i] elsewhere, would sound like [m e ə r i] with an obscure schwa-like vowel intervening. Bronstein (1960) reports that *Harry*, *marry*, and *Mary*

12) The original Japanese text: ややだらしく口を開け気味にするともっといいかもしれません。

rhyme in “Upper Ohio Valley” and gives the following examples; “[h ε ə r i] for *Harry*, [m ε ə r i d] for *married*, [m ε ə r i] for *Mary* (Bronstein 1960: 153)”¹³⁾

I personally find the sequence [ε ə r] much easier than [æ r] to pronounce because it sounds like two Japanese syllables combined; エア.

Diphthongs

The four common diphthongs / aɪ /, / aʊ /, / oʊ /, and / eɪ / pose no serious problems for Japanese speakers. The Japanese language permits its five vowels to combine in any sequence, and Japanese students experience little difficulty in combining vowels to form a diphthong. The following observations, for example, show that substituting Japanese syllables オ and ウ would be a fair tactic to make the diphthong / oʊ /;

The starting vowel for the American / oʊ / is not so different from Japanese オ. It would serve a practical purpose to add a slight ウ to オ. (Takebayashi & Saito 2008: 46)¹⁴⁾

オウ would be fairly intelligible if you add lip-roundedness to ウ. (Kamiyama 2008: 101)¹⁵⁾

The teacher should perhaps tell his students to shift from the starting vowel to the closing sound in a gradual manner. The learners should be reminded that English diphthongs are not so much a combination of two discrete sounds as a continuous spectrum.

Postvocalic / r /

The phoneme / r / that follows a vowel in the same syllable is variously transcribed as / r /, / ə r /, or / ər /. Here I adopt the notation ‘ə r’ with the exception of such words as *bar* and *card*, where ‘a r’ seems to be the most favored transcription. There are seven major sequences involving postvocalic / r /; / a r /, / ɪ ə r /, / e ə r /, / ʊ ə r /, / ɔ ə r /, / aɪ ə r /, and / aʊ ə r /. For those students who have trouble with this sound, a non-rhotic dialect, where the postvocalic / r / is dropped and often replaced by a schwa-like vowel, would be a good option. The teacher should introduce the students to the distinction between rhotic and non-rhotic varieties of English and tell them that the postvocalic / r / is not an absolute necessity to sound like a native speaker. The non-rhotic pronunciations of syllables with postvocalic / r / could be represented fairly well by katakana; アア、イア、エア、ウア、オア、アイア、アワ.

13) Bronstein does not use the symbol e but ε for the vowel of *end* and *get*.

14) The original Japanese text: 米音の / oʊ / の出発点の母音は日本語のオとそれほど違わない。「オ」の後ろに軽く「ウ」を添えれば実用的には間に合う。

15) The original Japanese text: ウで唇を丸めるようにすれば、オウで十分に通用するでしょう。

Conclusion

The motive for writing this article dates back to my high school days, when I realized that some Americans used different vowels for words like *door*, *more*, *core* on the one hand and *law*, *bought*, *draw* on the other. Although the symbol ɔ was used for both classes of words in most English-Japanese dictionaries, it was obvious to me that this notation did not accurately reflect the accent of a large number of American English speakers.

Students tend to believe that the pronunciation found in their dictionary is the only authentic model to emulate, when in fact there is a high degree of variation in the pronunciation of English native speakers. Consequently, quite a few students end up feeling unsure about their pronunciation, which often negatively affects their willingness to engage in verbal communication with English speakers.

With an increasing number of audio resources available on the Internet, it has become extremely easy for students to get access to different accents of English. It is about time that a wider range of freedom were offered as to which vowel system of English should be learned. English is unique among the major languages of the world in that it allows great variation in its vowel phonemes and allophones, and this should be taken as an advantage for learners rather than a disadvantage. It is true that “learners do have to establish a consistent set of vowel sounds (Walker 2010: 84),” but the vowel system of an individual learner does not have to be that of any of the naturally occurring dialects. As long as a fair degree of consistency in his idiosyncratic speech is established, it would not be a serious problem for two non-native speakers to have different vowel inventories, for, after all, it is often the case that two native speakers have totally different vowel systems and still can enjoy a flawless conversation.

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