The Japanese Syllable Debate
A Skeptical Look at Some Anti-Syllable Arguments

GLOW in Asia XI
National University of Singapore
February 21, 2017

Timothy J. Vance
Introduction
Most linguists would agree that syllables seem to be basic units of speech production and perception, although syllables are notoriously difficult to define either articulatorily or auditorily.
Most researchers today who would identify themselves as phonologists analyze Japanese (i.e., modern Tokyo “standard” Japanese) as having both moras and syllables: one-mora light syllables, two-mora heavy syllables, and even three-mora superheavy syllables.
But there is no colloquial Japanese word that denotes a Japanese syllable in this sense, and ordinary native speakers know how to count moras but not how to count syllables.
Moras as Syllables
The psychological reality of moras in Japanese is beyond dispute.

Native speakers learn to count moras as small children, and moras are the metrical units of traditional Japanese poetry.
Also, since Japanese has quite restrictive phonotactics, there is no uncertainty about the boundaries between moras in the sense that every phoneme in a traditional linear transcription is unambiguously a member of one particular mora.
A prototypical Japanese mora consists of a single consonant followed by a short vowel, as in the three moras of /mi zo re/ 霧 ‘sleet’.

There are also moras consisting entirely of a vowel, as in the first and last moras of /e ga o/ 笑顔 ‘smiling face’.
Departing even further from the CV prototype are the two moraic consonants, /N/ and /Q/.
The moraic nasal /N/ has a wide range of phonetic realizations, but its place of articulation and aperture (stop or approximant) are determined by the immediately following segment:

/µko_µN_µbu/ [kõmːbw] 昆布 ‘kelp’
/µge_µN_µso/ [gẽũːso] 元素 ‘element’
The moraic obstruent /Q/ usually occurs immediately preceding a non-moraic obstruent and assimilates totally to that following obstruent:

/μhaμQμpa/ [hapː xa] 葉っぱ ‘leaf’
/μreμQμša/ [reɕː xa] 列車 ‘train’
There is also an intuitive boundary between moras within a long vowel, although there is no auditory division.

For example, using /H/ to represent moraic vowel length:

/µ to_µ H_µ ka/ [toːka] 十日 ’10 days’
In traditional Japanese language research in Japan, the term *onsetsu* 音節 ‘syllable’ was used to denote the units described here as moras.

Influential American Descriptivists followed this tradition and used the English word *syllable* to denote these same units.
These syllables/moras do not correspond exactly to the weight units of many models because the traditional Japanese units incorporate onsets:

<table>
<thead>
<tr>
<th>筏</th>
<th>‘raft’</th>
<th>/ikada/</th>
</tr>
</thead>
<tbody>
<tr>
<td>根拠</td>
<td>‘evidence’</td>
<td>/koNkyo/</td>
</tr>
<tr>
<td>取っ手</td>
<td>‘handle’</td>
<td>/toQte/</td>
</tr>
<tr>
<td>昨日</td>
<td>‘yesterday’</td>
<td>/kinoH/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ᵁ</th>
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</table>

ikada kokyō toqte kinō
The mora-as-syllable diagrams on the previous slide are not quite faithful to the now standard version of the traditional analysis, because all the syllables/moras have equal status.
In the traditional analysis, the moraic nasal /N/, the moraic obstruent /Q/, the vowel-length phoneme /H/, and (for some researchers) the second vowel in some $V_1V_2$ sequences are categorized as “special” moras.
One characteristic that makes special moras special is that they are less independent than “ordinary” moras.
Laurence Labrune, in a provocative 2012 article, advocates an analysis very similar to the one just described, but she calls the units in each example word moras and rejects the idea that moras are the syllables of Japanese.
Although Labrune does not make this point, treating Japanese special moras as syllables is at odds with the notion that syllables correspond fundamentally to a “sonority cycle,” that is, the “wave-like recurrence of peaks of sonority.”
If Japanese moras are syllables, all special moras are anomalous syllables, and many are highly anomalous.

Labrune treats special moras as “deficient prosodemes,” that is, as CV moras with either the C or the V position empty.
It follows from Labrune’s definition that all onsetless V moras are deficient prosodemes.

<table>
<thead>
<tr>
<th>紺</th>
<th>国家</th>
<th>こう</th>
<th>音</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘navy blue’</td>
<td>‘nation’</td>
<td>‘this way’</td>
<td>‘sound’</td>
</tr>
<tr>
<td>/koN/</td>
<td>/koQka/</td>
<td>/koH/</td>
<td>/oto/</td>
</tr>
</tbody>
</table>
According to Labrune, the property shared by all the moras she analyzes as deficient prosodemes is that “they are not readily accentable.”

This characterization is clearly correct for the traditional special moras, /N/, /Q/, and /H/, but not for onsetless vowel moras.
Many onsetless vowel moras do carry accent:

\[
/μo_μi_μru/ \text{ 老いる ‘grow old’}
\]

\[
/μi_μno_μči/ \text{ 命 ‘life’}
\]

\[
/μna_μo_μru/ \text{ 治る ‘get well’}
\]

\[
/μo_μči_μba/ \text{ 落ち葉 ‘fallen leaf’}
\]
Labrune therefore proposes that the distinction between full and deficient prosodemes is gradient rather than categorical, and that onsetless vowel moras are closer than other deficient prosodemes to the full end of a full-to-deficient continuum.
The basis for this scale is “relative capacity to work as [accent]-bearing units,” and this capacity supposedly reflects the degree of “acoustic prominence” (i.e., sonority).
The idea is not that accent is somehow assigned to deficient prosodemes probabilistically, with a different probability at each point on the continuum.

Rather, Labrune says, “[A]ny deficient mora except /Q/ can, under certain specific conditions, bear accent.”
Presumably the “specific conditions” differ for different mora types, but the likelihood of fulfilling the relevant conditions should decrease from left to right along the continuum.
In fact, however, there seems to be an abrupt discontinuity between the ordinary moras and special moras of traditional accounts.

These traditional accounts treat most onsetless vowel moras as ordinary moras.
Before considering the status of onsetless vowel moras in more detail, some other problematic aspects of Labrune’s continuum should be pointed out.
Needless to say, a CV mora with an epenthetic vowel does not differ in sonority from an otherwise identical mora with a non-epenthetic vowel.
Thus, the position of $CV_{epenthetic}$ must be based on something else.
The epenthetic vowels in question are those that appear in loanwords and do not correspond to vowels in the source language.
I will have nothing more to say about the dubious notion that ordinary native speakers somehow know which vowels are epenthetic in this sense and treat moras containing such vowels as deficient prosodemes.
Vowel devoicing is normally confined to short high vowels surrounded by voiceless consonants.
Thus, sonority does not provide a plausible reason for positioning $CV_{epenthetic}$ moras and voiced $V$ moras at the same point on the scale.
Many older descriptions report two common responses to the obvious difficulty posed by vowel devoicing in a syllable/mora that carries accent.

One response is to maintain the voicing of the vowel despite the fact that it is surrounded by voiceless consonants.
The other response is to devoice the vowel but shift the accent to a different syllable.

For most speakers today, however, the co-occurrence of accent and vowel devoicing is unproblematic.
The positions of /N/ and /H/ should be reversed, although I do not have time to argue this point here.
I agree that /N/ can bear accent in some rare cases, but it appears that /H/ cannot.
Since most realizations of the moraic nasal /N/ and all realizations of the moraic obstruent /Q/ have lower sonority than any realization of the vowel-length phoneme /H/, their relative ability to bear accent does not reflect their relative sonority.
Independence of Onsetless V Moras
A long vowel is phonetically distinct from a sequence of two identical short vowels in careful pronunciation.

Two identical short vowels are separated by vowel rearticulation:

/μ̃i/ ➔ [ɗi*] 辞意 ‘intent to resign’
/μ̃i H/ [ɗiː] ジー ‘G’
Labrune represents /H/ as just [−cns].

A short vowel would presumably be represented as a feature bundle that includes specifications for vowel quality.
In the case of /H/, the quality features of the immediately preceding vowel are simply prolonged.
/μŷi↓μH/ [dzǐx]
As a result, /iH/ and /ii/ would be indistinguishable.
/μỹiŋμi/
[dʐᵢ*ᵢ]

\[
\begin{array}{c}
\mu \\
C \\
\tilde{y} \\
i \\
\end{array} \\
\begin{array}{c}
\mu \\
C \\
C \\
\end{array}
\]

\[
\begin{bmatrix}
-cns \\
+hi \\
-bk
\end{bmatrix}
\begin{bmatrix}
-cns \\
+hi \\
-bk
\end{bmatrix}
\]
The expectation is that something like the OCP would apply:
What needs to be explained is why /ŷii/ is not pronounced with a long vowel.

The two adjacent feature matrices are identical, but they are not merged into a single matrix associated with both vowel slots.
Intuitively, the second mora of /ǰiH/ behaves like a special (dependent) mora, but the second mora of /ǰii/ behaves like an ordinary (independent) mora.

This difference casts doubt on the decision to treat all onsetless V moras as deficient prosodemes.
Furthermore, as already noted, onsetless V moras do not show the resistance to bearing accent that Labrune’s continuum predicts.

On the other hand, some onsetless high-vowel moras do seem to be dependent (i.e., “special”).
Quasi-Diphthongs
$V_1V_2$ sequences ending in a high vowel (/i/ or /u/) are problematic because some behave like diphthongs while others do not.

The term “quasi-diphthong” is used here to avoid any suggestion that Japanese diphthongs are single phonemes.
In a model with both moras and syllables, it is often hard to tell whether or not the two vowels in a V/i/ or V/u/ sequence are in the same syllable.
In an analysis with no distinction between moras and syllables, a quasi-diphthong can be defined as a $V/i/$ or $V/u/$ sequence in which the second vowel behaves like a dependent (i.e., “special”) mora, and the corresponding challenge is deciding whether or not there is such dependence.
In Labrune’s analysis, of course, all onsetless V moras are deficient prosodemes, and if dependence necessarily follows from deficiency, then all $V_1V_2$ sequences would have to be quasi-diphthongs.
My position is that there is a distinction between dependent and ordinary V moras, although some instances of /i/ in V/i/ and /u/ in V/u/ are not readily categorizable. The basis for this distinction is accentual behavior.
In principle, a noun consisting of $n$ ordinary moras (or, equivalently, $n$ light syllables) can have any of $n+1$ accent patterns: it can have an accent on any one of its $n$ moras or it can be unaccented.
Special moras, however, cannot ordinarily bear accent, as noted earlier. Consequently, in an analysis with syllables, the number of possible accent patterns for a noun is one more than the number of syllables, regardless of whether the syllables are heavy or light.
This relationship between the number of accent patterns and the number of syllables is the basis for saying that syllables, not moras, are the accent bearing units in Japanese.
A downward-pointing arrow marks the location of the distinctive pitch fall in an accented word.

It appears between the two moras of an accented heavy syllable because, according to traditional descriptions, the first mora of such a syllable is H and the second mora is L.
For example:

\[/\sigma k\sigma \downarrow_\mu H_\sigma k\sigma / \quad [k\sigma \kappa \sigma \kappa] \quad \text{効果 'effect'}\]

\[/\sigma b\sigma \downarrow_\mu N_\sigma k\sigma / \quad [b\sigma \eta \kappa \sigma \kappa] \quad \text{文化 'culture'}\]

\[/\sigma k\sigma \downarrow_\mu Q_\sigma k\sigma / \quad [k\sigma k\kappa \alpha] \quad \text{国家 'nation'}\]

Phonetically, the pitch declines smoothly from the beginning to the end of an accented heavy syllable.
It is resistance to bearing accent that has led researchers to treat some V/i/ and V/u/ sequences as quasi-diphthongs.
If onsetless high-vowel moras repelled accent consistently (or at least nearly consistently), they could simply be categorized as special moras, always dependent on an immediately preceding ordinary mora.

In fact, however, there is no such consistency.
The second vowel in many V/i/ sequences does bear accent, as in /hiˌroʊɪəzuˌmu/ ヒロイズム ‘heroism’.

Comparable V/u↓/ examples are rare, in part because V/u/ is much less frequent than V/i/ overall.
Even in an analysis without syllables, an onsetless /i/ or /u/ that carries accent is clearly not dependent on a preceding ordinary mora.

But the status of an onsetless /i/ or /u/ that does not carry accent (as in V↓/i/ or V/i/) is often uncertain.
The are, however, examples that support the claim that some $V/i/$ and $V/u/$ sequences are quasi-diphthongs. One line of argument involves the default accent pattern for loanwords and foreign names.
The default location for accent is the syllable containing the antepenultimate mora (or the first syllable if the word is shorter than three moras).
To make a convincing case for this default pattern, of course, it is necessary to set aside examples that are accented on the syllable that corresponds to the syllable that carries accent or (primary) stress in the source language.
Examples like these are not probative:

**DEFAULT**

\[ /\sigma k_\mu N_\sigma d e \downarrow \mu N_\sigma s a_\mu H/ \text{ condéns} \]

**NON-DEFAULT**

\[ /\sigma k o \downarrow \mu N_\sigma t e_\sigma s u_\sigma t o/ \text{ contrast} \]
Relevant examples include:

\[ /_{\sigma}^{\alpha}{b}_{\sigma}{n}_{\sigma}{n}_{\sigma}/ \text{banána} \]
\[ /_{\sigma}^{\alpha}{s}_{\mu}{H}_{\sigma}{s}_{\mu}{H}_{\sigma}{\ji}/ \text{súusage} \]
\[ /_{\sigma}^{\alpha}{\sha}{\mu}{H}_{\sigma}{\pu}_{\mu}{H}/ \text{shampóo} \]
\[ /_{\sigma}^{\alpha}{k}_{\sigma}{\ca}{\mu}{Q}_{\sigma}{\pu}/ \text{kétchup} \]
In many loanwords, a sequence of the form \((C)V/i/\) arguably behaves like a heavy syllable with respect to default accent.
For example, /taipura↓itaH/ (from typewriter) has default accent if /i/ is a special mora:

/σta_μi_σpu_σra↓μ3ta_μH/ typewriter
$V_1 V_2$ Sequences with Non-High $V_2$
$V_1V_2$ sequences ending in a non-high vowel are especially problematic for Labrune’s claim that all onsetless $V$ moras are deficient prosodemes.

The second vowels in such sequences seem to behave consistently like ordinary (independent) moras.
Labrune does, however, cite one interesting phenomenon involving the citation forms of certain verbs. If such a form is accented, the accent almost always appears on the penultimate mora, as in /koba↓m-u/拒む ‘to refuse’ and /sake↓-ru/ 避ける ‘to avoid’.
But if a verb has an accented citation form with four or more moras that ends /aeru/ or /oeru/, it may have an alternative accent location on the third mora from the end:

/kaNgae↓ru/~/kaNga↓eru/

考える ‘to think’
Labrune overstates the case by claiming that /kaNgae↓ru/ is the expected form and /kaNga↓eru/ the actually occurring form, but accent dictionaries list both.
Most three-mora citation forms that end in /aeru/ or /oeru/ and are accented allow only penultimate accent, as in /hae¬ru/ 生える ‘to grow’ (*/ha↓e¬ru/).

But there are exceptions: /ka¬er¬u/ 返る ‘to return (intrans)’ and /ka¬es¬u/ 返す ‘to return (trans)’.
The exceptional antepenultimate accent on some (but not all) verb citation forms with onsetless /e/ as the penultimate mora seems to be the only evidence in favor of the claim that onsetless moras with non-high vowels repel accent.
When an accented verb citation form has a devoiced vowel in the penultimate mora, conservative speakers sometimes shift the accent.

For example, instead of \( /\text{cu}_\circ \downarrow k-u/ \) 着く ‘to arrive’, final-accented \( /\text{cu}_\circ k-u\downarrow/ \) is also possible.
There are no comparable examples of accent shifting off an onsetless /e/ or /o/ mora:

/e↓-ru/ 得る ‘to obtain’ */e-ru↓/
/o↓r-u/ 折る ‘to fold’ */or-u↓/
Of course, moras with devoiced vowels are closer to the deficient end of Labrune’s proposed continuum than onsetless /e/ and /o/.
And as for onsetless /a/, the most sonorous of Labrune’s deficient prosodemes, there is also no reason to believe that it repels accent.

Consider compounds in which the second element (E2) begins with /a/.
According to well-known patterns of compound accentuation, many such compounds should have E2-initial accent.
For example, the deverbal noun /aₜ-soₜ-bi/ 'pastime' (cf. unaccented /asob-u/ 'to play') is unaccented, and since it is longer than two moras, the expected accent on a compound ending with this element is E1+/a↓sobi/.
When the first mora of E2 in a comparable compound has a devoiced vowel, conservative speakers typically shift the accent to the right.

For example, since three-mora /ɦicuɭi/ ‘sheep’ is unaccented, the predicted accent on the compound meaning ‘lamb’ is /ko+ɦi↓cuɭi/ 子羊.
But since the high vowel /i/ in the first mora of E2 is surrounded by voiceless consonants, it is normally devoiced.

Accent dictionaries give both shifted /ko+h̄icu↓ji/ and unshifted /ko+h̄i↓cujī/ as possible pronunciations.
There does not seem to be any similar tendency to shift accent in compounds like /hi+a↓sobi/ 火遊び ‘playing with fire’.
An Empirical Test
As a rudimentary test of accent repulsion by onsetless /a/, compounds with E2s of the form /a/CVCV were compared to compounds with E2s of the form /na/CVCV.

The CV mora /na/ differs minimally from /a/, and the number of relevant compounds is reasonably small.
The two samples were restricted to compounds that are listed in both of two relatively small dictionaries. This restriction limits the sample to words are likely to be in the active vocabulary of an ordinary speaker and likely to be listed in the accent dictionary consulted (NHK 1998).
Compound nouns that could be analyzed as derived from a verb+verb compound verb were excluded because such compounds are likely to follow a different accent pattern.
Also, compounds with an E2 that has initial accent as an independent word were excluded.

For example:

/ǰiki+a↓raši/ 磁気嵐 ‘magnetic storm’

cf. /a↓raši/ ‘storm’
This last restriction was probably unnecessary, but one could argue that faithfulness protects an E2-initial accent in such a compound from disappearing or appearing somewhere else.
The resulting small sample contains a total of 46 compounds, 18 with /na/CVCV E2s and 28 with /a/CVCV E2s. Almost all have the expected E2-initial accent.
For example:

/kuni+na↓mari/ 国訛り
‘provincial accent’
cf. /namari↓/ ‘accent’

/cubaki+a↓bura/ 椿油
‘camellia oil’
cf. /abura/ ‘oil’
The only exception in the /a/ set is unaccented /ne+agari/ 値上がり ‘price rise’ (cf. /agari/ ‘rise’).

There are two exceptions in the /na/ set: /yoko+nagare/~/yoko+nagare↓/ 横流れ ‘flowing into illegal channels’ and /yoko+nagaši/~/yoko+nagaši↓/ 横流し ‘diversion into illegal channels’.
For two other words in the /na/ set, the expected form is one of two alternatives:

/kao+na↓jimi/~/kao+naǰimi/
顔馴染み ‘face familiarity’

/kuči+naraši/~/kuči+na↓raši/
口慣らし ‘speaking exercise’
The point, of course, is that /a/ does not appear to be more likely to repel accent than /na/.
Final Thoughts
This presentation has scrutinized some of the specific details of Labrune’s no-syllable analysis of Japanese, and many are problematic.
In particular, Labrune is almost certainly overreaching in her attempt to extend the notion of deficient prosodeme beyond the traditional class of special moras to moras with devoiced vowels, moras with epenthetic vowels, and all onsetless vowel moras.
FULL  DEFICIENT

\{
\begin{align*}
C/a/ & > \{/i/ \} > CV_{\text{devoiced}} > /N/ > /Q/ \\
C/o/ & > /u/ > /H/ \\
C/e/ & > C/o/ \\
C/i/ & > C/e/ \\
C/u/ & > C/i/ \\
/a/ & > C/u/ \\
/o/ & > /a/ \\
/e/ & > /o/ \\
\end{align*}
\}

CV_{\text{devoiced}} \quad \text{new}

old
INDEPENDENT
“ORDINARY”

\{C/a/\}
\{C/o/\}
\{C/e/\}
\{C/i/\}
\{C/u/\}
\{/a/\}
\{/o/\}
\{/e/\}

\{/i/\}
\{/u/\}

\{/N/\}

DEPENDENT
“SPECIAL”

\{/i/\}
\{/u/\}

\{/H/\}
\{/Q/\}

\{/N/\}
INDEPENDENT
“ORDINARY”

\{C/a/ \}
\{C/o/ \}
\{C/e/ \}
\{C/i/ \}
\{C/u/ \}
\{/a/ \}
\{/o/ \}
\{/e/ \}

\{/i/ \}
\{/u/ \}
\{/N/ \}
\{CV_{devoiced} \}

DEPENDENT
“SPECIAL”

\{/i/ \}
\{/u/ \}
\{/H/ \}
\{/Q/ \}

\{/N/ \}
\{CV_{devoiced} \}

Syllabic but repels accent.
(obsolescent Tokyo varieties)
Despite these problems, however, I agree with Labrune that “the patterns previously analyzed with syllables can be analyzed without syllables . . . .” Nonetheless, I am not ready to give up the idea that syllables are universal.
My current position is that syllables really are basic units of speech production and perception in all languages but that language-particular factors can prevent them from becoming psychologically salient units for speakers of some languages.
The most likely candidate for a language-particular factor in the case of Japanese is the writing system, specifically the mora-based kana subsystems that children learn first on the path to literacy.
It has been proposed that learning to read and write *kana* might cause or at least enhance the strong moraic intuitions of adult speakers.
There is also experimental evidence that pre-literate children find it natural to treat syllables as units instead of or in addition to moras, and that their behavior becomes more mora-based as they learn *kana*.
ご清聴ありがとうございました

σgo se i čo μ H
a ri ga to H go za i ma ši ta

Thank you for your kind attention