Is Spanish Stress Perceived as Japanese Vowel Length?

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(A Preliminary Report)

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Introduction
Today’s presentation is a preliminary progress report on some joint work with Dr. Izumi Takiguchi, assistant professor in the Faculty of Foreign Studies at Bunkyo Gakuin University.
Although we have been discussing this project for many months, we have only done a pilot study so far.

Our hope is that members of the audience will give us some advice about how to proceed efficiently and effectively.
Background
The person who “inspired” this project is Javier Aguirre Onaindía, the former coach of the Japanese men’s national soccer team (from August 2014 until February 2015).
When he was first named coach, there was some discussion on a television program about how his surname should be pronounced in Japanese.

The question was whether the vowel in the middle syllable should be short or long.
Spanish
/a.gí.ře/
[aɣiɾe]
trill

Japanese
J/a.gḭ.re/
[agiɾe]
tap
OR
J/a.gḭi.re/
[agiɾiɾe]
The consensus was that the pronunciation with a long vowel sounded more like the Spanish pronunciation, and this is how the name was usually rendered in Japanese:

アギーレ  
\( /a.gi^\prime i.re/ \)
Some Basic Spanish
We have relied on José Hualde’s excellent 2005 book for information about Spanish phonetics and phonology.
Most varieties of Spanish, including standard Castilian and standard Mexican, have a vowel system with five contrastive qualities and no short vs. long contrast.

Spanish is phonotactically less restrictive than Japanese but more restrictive than English.
In his discussion of stress, Hualde mentions both pitch and length as correlates.

From observation of words in isolation we might conclude that stressed syllables are associated with the highest pitch in the word. This would be, however, an erroneous conclusion. [p. 243]
In other contexts, where the word is not in nuclear position in a declarative sentence, the pitch contour over the sentence will be different, and we will not necessarily find that the stressed syllable has the highest pitch in the word. [p. 243]
Duration is . . . another correlate of stress. Notice that this is not the same thing as saying that the stressed syllable will always be the longest syllable of the word, since some segments are intrinsically longer than others (and, in addition, duration also has other linguistic functions). [p. 244]
Hualde also notes that Spanish is (impressionistically) syllable-timed.

[The] differences in duration between stressed and unstressed syllables are . . . much greater in English than in Spanish. [p. 273]
Thus, it is not at all clear what to expect as far as how Spanish stressed syllables will be adapted into Japanese.
Proper Nouns
Very few common nouns have been borrowed from Spanish into Japanese, but many Latin Americans with Hispanic surnames play baseball professionally in Japan.

Also, maps and guidebooks need to render Spanish and Latin American place names.
In general, what we find is that a Japanese long vowel always corresponds to a Spanish vowel in a stressed syllable.

However, not every Spanish vowel in a stressed syllable corresponds to a Japanese long vowel.
ウィリー・モー・ペーニャ  （WILY MO PENA）
1982年1月23日生  身長191cm  体重118kg  右投右打
ラグナサラダ高 - レッズ - レッドソックス - ナショナルズ - ダイ

エンジェルベルト・ソト  （ENYELBERT SOTO）
1982年8月20日生  身長185cm  体重96kg  左投左打
ラファエルマリアパウル高 - 米マイナー - イタリア・コドーニョ
ノガレス (ソノーラ州)
Language Textbooks
We also looked at two Spanish language textbooks written for linguistically unsophisticated Japanese-speaking learners. Both transliterate Spanish in katakana.
Spanish You Can Speak Starting from Zero
by Kunihiko Satō (2000)
Spanish for Beginners
by Hisao Nakano (2014)
The earlier of these two books (Satō 2000) offers a brief and amazingly unhelpful comment on Spanish stress and Japanese vowel length.
The accented portion often sounds a little longer, but if you consciously pronounce it long, it is unnatural in some cases. In this book, the katakana length mark sometimes appears and sometimes does not, on a case-by-case basis.
The goal of the transliterations in such books, of course, is not to adapt Spanish words for borrowing into Japanese.

The point is to elicit comprehensible Spanish from unsophisticated learners by using katakana as a crude phonetic transcription.
Nonetheless, if perception is involved in inducing the vowel length we see in many proper nouns adapted from Spanish, it is reasonable to expect the transliterated forms in textbooks to follow essentially the same pattern.
Textbook

Glossary

Data
There are 278 content words that are listed in the glossaries of both textbooks.

As in English, function words tend to be unstressed.
The segmental correspondences between these Spanish words and their Japanese transliterations are straightforward and not especially interesting.
Aside from a few trivial uncertainties that are not relevant today, a mechanical procedure can correctly determine the katakana spelling for a textbook word, EXCEPT for vowel length.
If the Japanese syllable containing the vowel corresponding to the vowel in the Spanish stressed syllable is already heavy (2 moras) when that Japanese vowel is short, the Japanese vowel is never lengthened.
hombre オンブレ
S/óN.bre/ → J/oN.bu.re/
×J/ooN.bu.re/

jersey ヘルセイ
S/xer.séi/ → J/he.ru.sei/
×J/he.ru.seei/
Otherwise, there seems to be an interaction between default accent and vowel length in the Japanese forms.
When \( \acute{S}/\acute{V}/ = \acute{J}/\acute{V}^\uparrow / \), and lengthening this Japanese vowel would create a 2-mora syllable (100 words), both books have a short vowel in 44 words, one has a long vowel and the other has a short vowel in 33 words, and both have a long vowel in 23 words.
negro  ネグロ

\( ^S/né.gro/ \rightarrow ^J/ne\-'gu.ro/ \)

lunes  ル(一)ネス

\( ^S/lú.nes/ \rightarrow ^J/ru\-(u).ne.su/ \)

madre  マードレ

\( ^S/má.dre/ \rightarrow ^J/ma\-'a.do.re/ \)
In these examples, the Japanese default accent remains on the same syllable (i.e., the syllable containing the antepenultimate mora) regardless of whether the vowel in that syllable is short or long.
When $S/\acute{V}/ \neq J/V^\text{\textdegree}$/, and lengthening this Japanese vowel would create a 2-mora syllable that contains the antepenultimate mora and thus attract default accent (123 words), the result of vowel length is $S/\acute{V}/ = J/V^\text{\textdegree}V/$.
For these 123 words, both books have a short vowel in 16 words, one has a long vowel and the other has a short vowel in 11 words, and both have a long vowel in 96 words.
papel  パペル
S/pa.pé'l/ → J/paɻ.pe.ru/
guitarra  ギタ(一)ラ
S/gi.tá.ɭa/ → J/giɻ.ta.ra/~/gi.taɻa.ra/
pequeño  ペケーニョ
S/pe.ké.no/ → J/pe.keɻe.nyo/
The transliteration examples considered so far indicate that one motivation for vowel length is to produce a match between Spanish stress and Japanese accent.
Compare Kitahara’s (1997) suggestion that default accent is a factor in gemination in borrowing from English.
\[ \frac{S/\acute{V}/}{S/\acute{V}/} = \frac{J/\overline{V}/}{J/\overline{V}/} \]

and

\[ \frac{S/\acute{V}/}{S/\acute{V}/} = \frac{J/\overline{V}/V/}{J/\overline{V}/V/} \]

\[ n = 100 \]

\[ V \ 44\% \]

\[ V\sim VV \ 33\% \]

\[ VV \ 23\% \]

\[ \frac{S/\acute{V}/}{S/\acute{V}/} \neq \frac{J/\overline{V}/}{J/\overline{V}/} \]

but

\[ \frac{S/\acute{V}/}{S/\acute{V}/} = \frac{J/\overline{V}/V/}{J/\overline{V}/V/} \]

\[ n = 123 \]

\[ V \ 13\% \]

\[ V\sim VV \ 9\% \]

\[ VV \ 78\% \]
In a few cases (13 words), default accent does not fall on the Japanese syllable containing the vowel corresponding to the vowel in the Spanish stressed syllable regardless of whether this Japanese vowel is short or long.
For these 13 words, both books have a short vowel in 4 words, one has a long vowel and the other has a short vowel in 7 words, and both have a long vowel in 2 words.
miércoles  ミエルコレス
\( /\text{miér.co.les}/ \rightarrow /\text{mi.e.ru.ko}^-\text{re.su}/ \)

fábrica  ファ(一)ブリカ
\( /\text{fá.bri.ka}/ \rightarrow /\text{fa.bu}^-\text{ri.ka}/~
/\text{faa.bu}^-\text{ri.ka}/ \)

bolígrafo  ボリーグラフォ
\( /\text{bo.lí.gra.fo}/ \rightarrow /\text{bo.rii.gu}^-\text{ra.fo}/ \)
Pilot Study
We have run a simple-minded pilot study to see whether naïve native speakers of Japanese might be likely to perceive the vowels in Spanish stressed syllables as long.

The stimuli were taken from the CD that comes with one of the textbooks (Nonaka 2014).
The stimuli are just natural tokens of words in isolation, produced (we presume) by native speakers of Spanish.

One of the test items is shown on the following slide.
クワトロ クワートロ
This test item is a production of the word *quatro* ‘four’: $/kuá.tró/$

The two response choices are クワトロ $/ku.wa.to.ro/$ (with a short vowel in the second syllable) and クワートロ $/ku.waa.to.ro/$ (with a long vowel in the second syllable).
In this case, the Japanese default accent will be on the syllable corresponding to the Spanish stressed syllable regardless of whether the relevant vowel is short or long:

\[ / ku\text{-}wa^\text{\textperiodcentered}to\text{-}ro/ \quad / ku\text{-}wa^\text{\textperiodcentered}a\text{-}to\text{-}ro/ \]
We might hypothesize that Japanese listeners will tend to perceive the relevant vowel as short in cases like this.

Another of the test items is shown on the following slide.
ヌエベ ヌエーベ
This test item is a production of the word *nueve* ‘nine’: $/nué.be/$

The two response choices are ヌエベ ジ/$nu.e.be/$ (with a short vowel in the second syllable) and ヌエーベ ジ/$nu.ee.be/$ (with a long vowel in the second syllable).
In this case, the Japanese default accent will be on the syllable corresponding to the Spanish stressed syllable if the relevant vowel is long but not if it is short:

\[ /\text{nu}\text{-}e\text{-}\text{be}/ \]  \[ /\text{nu}\text{-.}e\text{-}e\text{-}\text{be}/ \]
We might hypothesize that Japanese listeners will tend to perceive the relevant vowel as long in cases like this.
12 college students participated in our pilot study.

There were 15 test items, and each participant listened to each item 10 times.

Thus, there were 120 responses for each of the 15 test items.
For 2 of the test items, a long vowel results in an extra-long syllable.

As expected, the participants favored short-vowel responses in these cases:

- **grande** \(^S/\text{grán.de}/\) \(\text{avión} \)^\(^S/\text{a.bióN}/\)

  - \(^J/\text{gu.rań.de}/\) 114 \(\text{J/a.biį.oN}/\) 110
  - \(^J/\text{gu.ra^aN.de}/\) 6 \(\text{J/a.bi.ōoN}/\) 10
Our main interest was in comparing these three groups of test items:

<table>
<thead>
<tr>
<th>Short 😞 Long 😊</th>
<th>Short 😊 Long 😊</th>
<th>Short 😞 Long 😞</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/pa.pél/</td>
<td>S/xú.lío/</td>
<td>S/fá.bri.ka/</td>
</tr>
<tr>
<td>S/sié.te/</td>
<td>S/lá.pis/</td>
<td></td>
</tr>
<tr>
<td>S/ko.lór/</td>
<td>S/ká.ro/</td>
<td></td>
</tr>
<tr>
<td>S/pa.ké.te/</td>
<td>S/ní.ño/</td>
<td></td>
</tr>
<tr>
<td>S/sa.pá.to/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results for each group look like this:

- short ☹️ 58%
  long ☑️ 42%

- short ☑️ 58%
  long ☑️ 42%

- short ☹️ 88%
  long ☹️ 12%
These results do not support the hypothesis that Japanese listeners are more likely to perceive the vowel in an accented Spanish syllable as long if a long vowel causes the default accent to fall on the corresponding syllable in the Japanese adapted form.
Of course, the acoustic properties of the 15 test items were completely uncontrolled.

It is still possible that default accent interacts with the perception of length in something like the way suggested above.
The conspicuously high proportion of “long” responses to \( ^{S}/ní.\text{no}/ \) (91% \( ^{J}/niri.\text{nyo}/ \) vs. 9% \( ^{J}/ni\text{˘i}.\text{nyo}/ \)) may have something to do with the fact that \( \text{El Niño} \) has been borrowed into Japanese and lexicalized with a long vowel:

エルニーニョ \( ^{J}/e.\text{ru}.nirīi.\text{nyo}/ \)
There is no comparable explanation for the proportion of “long” responses to \( ^{S}/\text{pa.ké.te}/ \) (100% \( ^{J}/\text{pa.ke^-e.te}/ \) vs. 0% \( ^{J}/\text{pa^-ke.te}/ \)).
We also grouped the responses by how the relevant vowel was transliterated in the textbooks (excluding the two test items in which a long vowel would create an extra-long syllable):

<table>
<thead>
<tr>
<th>TEXTBOOKS</th>
<th>LONG RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>both short</td>
<td>28%</td>
</tr>
<tr>
<td>both long</td>
<td>58%</td>
</tr>
<tr>
<td>1 short</td>
<td>1 long</td>
</tr>
<tr>
<td>12%</td>
<td></td>
</tr>
</tbody>
</table>
Future Directions
We are planning to refine our hypotheses and test them rigorously using manipulated stimuli.
For example, using a vowel-length continuum, we might expect that the category boundary duration for perceiving a Spanish vowel as long would be shorter if a long Japanese vowel would shift the default accent from the “wrong” syllable to the “right” syllable.
We welcome your suggestions.
Thank you very much for listening.
Muchas gracias por su atención.
ご清聴ありがとうございました。