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Assessing the Pronunciation of Japanese Leaners of English

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1. Introduction

There is a trend that native-like pronunciation is neither a realistic nor a suitable goal for leaners of English as a second language (Isaacs, 2013). The absence of pronunciation in rating scales of frequently used speaking tests reflects this fact. Even if pronunciation is included in a scale, it is evaluated mainly in terms of intelligibility or comprehensibility (cf. Appendix 1). Having a good command on segmental and prosodic features, however, will encourage leaners to speak out. The present study attempted to provide detailed pronunciation assessment using multiple metrics. Utterances produced by native speakers of Japanese on an English word reading-aloud task were evaluated by a phonetically trained Japanese-English bilingual. The correlation among the metrics was also examined to explore what property contributes to good pronunciation.

2. Method

2.1. Utterances

Utterances obtained in Eguchi and Yamada (manuscript under preparation) were used for the study. Among them, twenty English words produced by ten native speakers of Japanese on a word reading-aloud task were used. The age of the speakers, including both males and females, ranged from 19 to 40. Their English ability in terms of grade or score on English tests varied from EIKEN Grade 3 to TOEIC score 940, and none of them has been lived or studied abroad more than 12 months. The words used were following twenty words of low and high familiarity:

ahead	allegory	amass	aperitif	badminton
belfry	believe	bring	calcium	caul
Christmas	coate	conciliatory	curriculum	delicious
derelict	diode	disavow	discriminatory	doting

2.2. Assessment

Assessment was done by a phonetically trained Japanese-English bilingual. Each utterance was first transcribed with IPA and then evaluated using six metrics: 1. phoneme substitution; 2. elision; 3. epenthesis; 4. primary stress; 5. rhythm; 6. holistic goodness. One-syllable words were excluded in the evaluation with metric 4 and 5. Occurrence of phoneme substitution, elision and epenthesis was counted respectively for each speaker. Primary stress was evaluated by being classified into three

groups : no stress placement, stress placement on a wrong syllable, and stress placement on a right syllable. The ratio of the count in the third category to the entire count was obtained as accuracy in primary stress, and accuracy was obtained for each speaker and for each word. Metric 5, rhythm, was rated on a scale of 1 to 3 (1=not good, 3=good) and metric 6, holistic goodness, of 1 to 5 (1=not good, 5=good). Average scores for metric 5 and 6 were calculated by speaker and by word.

3. Result

3.1. Phoneme substitution, elision, epenthesis

Frequent occurrences were:

- Substitution of weak vowel /ə/ with /a/, /ʌ/ or /eɪ/
- Substitution of /ɪ/ with /i/
- Substitution of /aʊ/ with /oʊ/
- Substitution of /ɹ/ with /ɾ/ (alveolar flap)
- Elision of /oʊ/ (as in -tory)

A strong correlation was found between holistic goodness and substitution (r = 0.95, Fig.1), but not between holistic goodness and epenthesis (r = 0.63, Fig.2) or elision (r = 0.26, Fig.3).

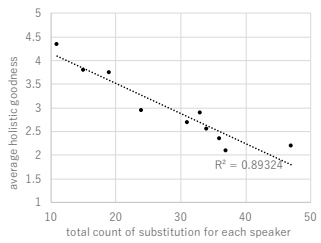

Fig.1 Correlation between substitution and holistic goodness

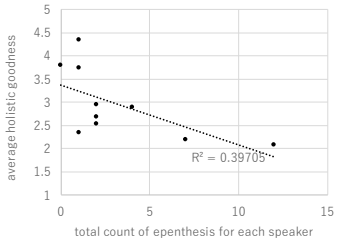

Fig.2 Correlation between epenthesis and holistic goodness

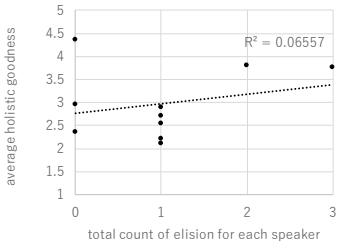

Fig.3 Correlation between elision and holistic goodness

3.2. Primary stress

Primary stress was perceived in all the bi- and polysyllabic words, except *coate*, which was pronounced as monosyllabic by most of the speakers. The accuracy by speaker varied widely, from 41% to 94 %. A strong correlation was evident between holistic goodness and the average by speaker (r = 0.86, Fig.4) as well as the average by word (r = 0.79, Fig.5).

3.3. Rhythm

The average scores by speaker varied from 1.41 to 2.76 and the average scores by word varied from 1.0 to 2.8. A very strong correlation was found between holistic goodness and the average rhythm by speaker (r = 0.97, Fig. 6) as well as the average rhythm by word (r = 0.95, Fig.7).

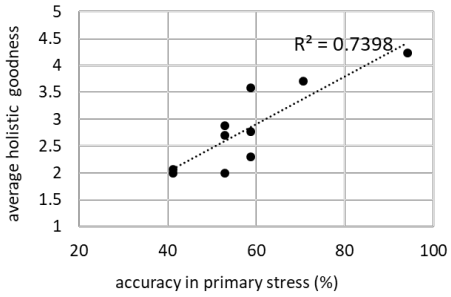

Fig.4 Correlation between holistic goodness and primary stress (by speaker)

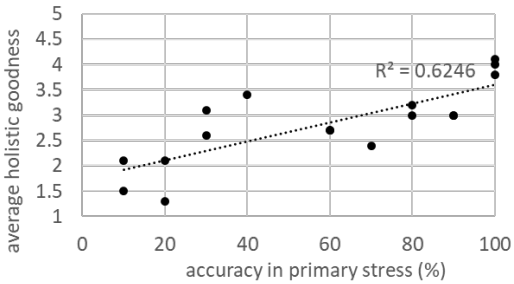

Fig.5 Correlation between holistic goodness and primary stress (by word)

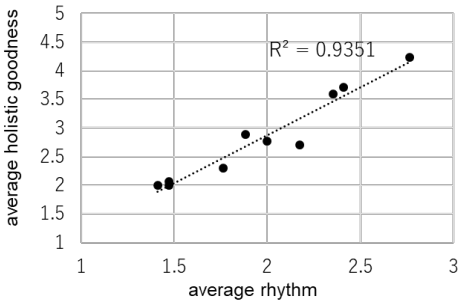

Fig.6 Correlation between holistic goodness and rhythm (by speaker)

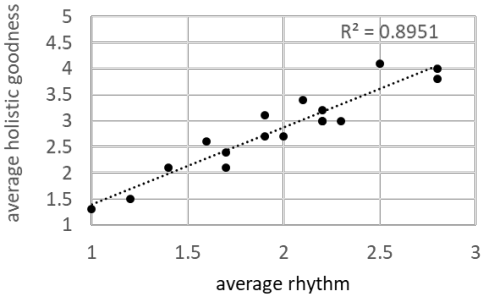

Fig.7 Correlation between holistic goodness and rhythm (by word)

3.4. The number of syllable and holistic goodness

The result of one-way ANOVA [F (4, 45) = 2.578, $p < 0.01$] suggested that the average holistic goodness varied significantly by the number of syllable. A post hoc pairwise comparisons showed that the average holistic goodness in the one-syllable group was significantly higher than the other syllable groups while the average in the six-syllable group was significantly lower than the other groups. The average of two-, three- and four-syllable groups were mutually comparable (Fig. 8).

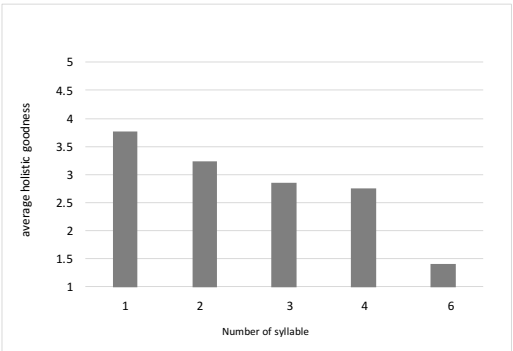

Fig.8 Correlation between the number of syllable and holistic goodness

4. Discussion

Apart from a well known substitution of / ɹ/ with /ɾ/ by Japanese speakers, the substitution of a weak vowel /ə/with /a/ or /ʌ/ as well as /ɪ/ with /i/ were highlighted in this study. This suggests producing weak/lax vowels is a hurdle for many Japanese leaners. Since weak vowels are an essential component of English rhythm, leaners must overcome this barrier to improve their pronunciation. The correlation analysis indicates a strong association between holistic goodness and phoneme substitution, primary stress and rhythm. This result indicates improving both segmental and supersegmental features is requisite for good pronunciation. Evaluating more utterances by multiple raters is needed to enhance the reliability of the findings. Some of the metrics used in this study requires phonological expertise, yet providing detailed pronunciation assessment is manageable: it took for the rater about three to four minutes to evaluate a test word. Accumulating detailed pronunciation assessment is beneficial not only to deeper and broader understanding of the Japanese accent but also to the development of pronunciation instruction material. Such assessment data can also be applied to computer-based pronunciation assessment.

References

Eguchi, S. and Akahane-Yamada, R. (unpublished)

Isaacs, T. (2014). "Assessing pronunciation." In A. J. Kunnan (Ed.), *The companion to language assessment*. (pp. 140-155). Hoboken, NJ: Wiley- Blackwell

Appendix.1: Extracts from speaking skills rating in frequently used English tests

TEST	Criteria	Rating	DESCRIPTION
TOEIC	• Pronunciation (when reading aloud, pronunciation is:)	High Middle Low	Highly intelligible Generally intelligible Not intelligible
	• Intonation and stress levels (refer to the ability to use emphases, pauses, falling-rising pitch to convey meaning)	High Middle Low	Highly effective Generally effective Generally not effective
TOEFL	• Delivery difficulties with pronunciation or intonation patterns that effect intelligibility • Difficulties that requires listeners effort	4 3 2 1	Minor difficulties which do not affect overall intelligibility Minor difficulties which may require effort at times but do not affect intelligibility significantly Basically intelligible, though listener effort is needed because of unclear articulation, awkward intonation, or choppy rhythm and pace Consistent difficulties that cause considerable listener effort
CEFR (Common European	Pronunciation and intonation are omitted		

Framework of Reference for Languages)			
IELTS (International English Language Testing System) *public version	Pronunciation	Band.9 (highest)	• Use a full range of pronunciation with precision and subtlety • Sustains flexible use of features throughout • Is effortless to understand
		Band 6	• Use a range of pronunciation features with mixed control • Shows some effective use of features but this is not sustained • Can generally be understood throughout, though mispronunciation of individual words or sounds reduced clarity at times
		Band 4	• Use a limited range of pronunciation features • Attempts to control features but lapses are frequent • Mispronunciation are frequent and cause some difficulty for the listeners
		Band 3	Shows some of the features of Band 2 and some, but not all, of the positive features of Band 4
		Band 2 (lowest)	Speech is often unintelligible