Acoustic analysis of the English pronunciation of Japanese high school teachers and university students

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Objectives
- Provide benchmark acoustic data on the L2 English pronunciation of Japanese junior and senior high school teachers and university students.
- Compare acoustic measures of pronunciation of university students before and after a 14-week EFL pronunciation course.
- Compare acoustic measures of pronunciation of junior high school student EFL teachers with university-level EFL students and native English speakers (all reading the same paragraph).

Background
As Japan attempts to meet the demands of the Ministry of Education by introducing English-as-a-Foreign-Language (EFL) classes in all elementary schools, there has been a shortage of qualified teachers. Japanese EFL teachers at all levels are knowledgeable in the English communicative ability and pronunciation, in particular of Japanese EFL teachers varies across educational levels, throughout Japan—including within individual prefectures.

Method
Subjects
Group 1: STD – 40 Japanese 3rd year undergraduate students
Group 2: JHS – 20 Japanese junior high school EFL teachers
Group 3: SHS – 20 Japanese senior high school EFL teachers
Group 4: NAT – 10 native speakers of American English

Gender balancing was only possible with Group 4, which had 5 males and 5 females. Group 5 had 32 males and 8 females, a typical ratio in the University of Aizu’s Computer Science and Engineering program. Group 2 had 5 males and 15 females, and Group 3 had 7 males and 13 females.

Much more data were recorded, but were not analyzed due to time constraints. Total subjects recorded in each group were 133 STD, 43 JHS, 34 SHS. Data from over 340 native English speakers exists in the Speech Accent Archive, the 10 speakers in Group 4 were chosen mainly on the basis of recording clarity.

Results
Duration of paragraph
Pitch
Intensity
Mean intensity of paragraph

Discussion and Conclusions
Using the duration of the entire reading as a measure of reading fluency, it is no surprise that the native speakers have the lowest duration—a mean of about 20 seconds. As expected, the students in their first class had the longest duration. It is interesting to note that they increased reading speed by the final lesson to be faster than both groups of teachers. As for the duration of schwa, it is a common problem among Japanese ESL speakers that schwa is pronounced too much like a full vowel. A larger reduction in students can be seen in students’ pronunciation from the initial lesson to the final lesson. In fact, the students reach the level of Japanese teachers of English by their last lesson.

Future Research
What acoustic measures best correlate with pronunciation proficiency as perceived by a native listener? Does intensity on a particular passage of speech result in the improvement of an L2 learner’s speech intelligibility in this speech?

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