1.0 Introduction
Phonological Rhythm Transfer: From Korean to English: English: A stress-timed language- Stressed syllables are timing beats- Unstressed syllables are uncounted for rhythm (Prator and Robinett, 1972:29)
- Korean: A syllable-timed language
- Japanese: A mora-timed language

2.0 Hypotheses
2.1 Hypothesis 1: Vowel Duration Korean learners inconsistently shorten the length of reduced or unstressed vowels in English.

2.2 Hypothesis 2: Syllable Duration Korean learners utter the unstressed syllables in English with inconsistent temporal reduction.

3.0 Research
3.1 Experiment 1
3.1.1 Research Participants: 10 Korean learners of English and 1 native speaker of American English
3.1.2 Method of Data Collection: Step 1: Explicit lessons on shortening in English vowels  
Step 2: Utterance practices with a pre-recorded model American English  
Step 3: Read, recorded, and digitized by CSL, in 16KHz & 16 bits
3.1.3 Material: 10 pairs of contrastive words containing stressed and reduced vowels.

<table>
<thead>
<tr>
<th>stressed</th>
<th>reduced</th>
<th>stressed</th>
<th>reduced</th>
<th>stressed</th>
<th>reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>depreciate</td>
<td>deprecate</td>
<td>add</td>
<td>addition</td>
<td>confirm</td>
<td>confirmation</td>
</tr>
<tr>
<td>implicit</td>
<td>implication</td>
<td>majority</td>
<td>major</td>
<td>society</td>
<td>social</td>
</tr>
<tr>
<td>explains</td>
<td>explanation</td>
<td>confront</td>
<td>confrontation</td>
<td>compute</td>
<td>computation</td>
</tr>
<tr>
<td>allege</td>
<td>allegation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2 Experiment 2
3.2.1 Research Participants: 10 Korean learners of English and 1 native speaker of American English
3.2.2 Method of Data Collection: Step 1: Explicit lessons on shortening in English vowels  
Step 2: Utterance practices with a pre-recorded model American English  
Step 3: Read, recorded, and digitized by CSL, in 16KHz & 16 bits
3.2.3 Material: 10 contrastive sentences containing stress alternations.
<table>
<thead>
<tr>
<th>stressed</th>
<th>reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>What explains this uni-directional paralysis?</td>
<td>But that explanation is partly true.</td>
</tr>
<tr>
<td>This is nevertheless the majority.</td>
<td>He is a man of major talent.</td>
</tr>
<tr>
<td>Will you please confirm the policy?</td>
<td>There was no confirmation about the policy.</td>
</tr>
<tr>
<td>Add remaining ingredients and bring to a boil.</td>
<td>Addition and subtraction are learned skills.</td>
</tr>
<tr>
<td>Does society really exist as an entity?</td>
<td>Differences were related to social backgrounds.</td>
</tr>
</tbody>
</table>

3.3 Experiment 3.3.1 Research Participants: 3 Japanese learners of English

3.3.2 Method of Data Collection:  Step 1: No explicit lessons on shortening in English vowels  
Step 2: No practices with a pre-recorded American English sample  
Step 3: Spontaneous speech recorded by using an analog cassette deck and digitized by Sound Blaster

3.3.3 Material: English conversation excerpts of spontaneous speech in the “Cross-Cultural Distance Learning” project by Waseda University.

4.0 Data Analysis
4.1 Waveforms, spectrograms, and pitch traces were analyzed by CSL and Pitch Works.
4.2 The duration ratio of the stressed vowels and the reduced syllables was measured.
4.3 Also measured was the ratio of the pitch height to observe the Korean research participants using both pitch and duration to express stress (Yang, 2002).

5.0 Results
5.1.1 Hypothesis 1: Supported
Korean learners of English inconsistently shorten the length of reduced or unstressed vowels in English when reading contrastive word-pairs and sentences.  
(Korean Data in Figures 1 & 3 show both above and below 100 %, meaning inconsistent reduction.)

5.1.2 Hypothesis 2: Supported
Korean learners of English utter the unstressed syllables in English with inconsistent temporal reduction when reading contrastive word-pairs and sentences.
(Korean Data in Figures 2 & 4 show both above and below 100%, meaning inconsistent reduction.)

5.2.1 Experiment 1

Figure 1. Ratio of Reduced vs. Stressed Vowel Durations in Word Pairs read by Korean learners and an American Speaker

Figure 2. Ratio of Reduced vs. Stressed Syllable Durations in Word Pairs read by Korean learners and an American Speaker

5.2.2 Experiment 2

Figure 3. Ratio of Reduced vs. Stressed Vowel Durations in Sentence Pairs read by Korean learners and an American Speaker
5.2.3 Experiment 3

Figure 5. Ratio of Reduced vs. Stressed Vowel Durations in Spontaneous Speech of Japanese Learners

6.0 Conclusion and Implications

6.1 Phonological rhythm transfer occurs from Korean and Japanese to English.
6.2 The relative duration ratio was more salient for the English native speaker, as pitch for the Korean and Japanese learners.

The vowel duration ratio for Korean and Japanese learners of English as shown in Figures 1, 3, 5, & 6 indicates both above and below 100%, meaning inconsistent reduction.

Beckman and Elam (1997) presents a number of examples that the speakers of
American English produce the stressed vowels with low pitch.

6.3 The validity of typological difference in phonological rhythm is also supported, in that English is a stress-timed language while Korean is a syllable-timed one.

References