Rhythmic Development of Monolingual and Bilingual Children at 2;06

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Introduction

- Linguists have long argued that languages belong to distinct rhythm classes
  - Stress-timed: English, German
  - Syllable-timed: French, Spanish
  - Mora-timed: Japanese

- Speech rhythm forms the prosodic cornerstone in early language acquisition, as newborn infants can distinguish languages based on their rhythms.

- Children have a bias towards syllable-timing because consonant clusters and vowel reduction are difficult to acquire.

- Only few studies on the acquisition of speech rhythm

Rhythmic Metrics

- No isochrony (units of equal duration) can be found acoustically

- Important phonological differences between stress- and syllable-timing

<table>
<thead>
<tr>
<th>Stress-timed languages</th>
<th>Syllable-timed languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word stress</td>
<td>Variable, complicated</td>
</tr>
<tr>
<td>Syllable structure</td>
<td>simple complex</td>
</tr>
<tr>
<td>Vowel reduction</td>
<td>frequent infrequent</td>
</tr>
</tbody>
</table>

- Rhythmic metrics based on durational variability were developed

\[ \Delta, \%V, \text{Varco} \text{ (global variability)} \]

- English: stress-timed; Cantonese: syllable-timed

Bilingual Acquisition of Speech Rhythm

- Monolingual children at age 3;0 already have different rhythmic patterns

- Bilingual children have distinct patterns from monolinguals: rhythmic delay affected by language dominance

- Less language separation for younger bilingual children

- Rhythmic metrics based on syllable duration are more robust than those on consonant and vowel duration for young children

- The present study:
  - Can observed differences between monolingual and bilingual children be found at an even younger age (2;06)?

Method

- 15 children aged ~2;06:
  - 5 Cantonese-English bilingual
  - 5 Cantonese monolingual
  - 5 English monolingual

- At least 20 utterances for each language

- 4-9 syllables for each utterance (MLU 5.5)

- Rhythmic metrics on syllable, consonant and vowel duration

- Vowel duration of English trochaic disyllable words in sentence medial position (stress patterns)

Results

- Rhythmic patterns (duration of V1/V2)
  - A tendency for weaker trochaic pattern in bilingual speech

- Stress patterns (duration of V1/V2)
  - Already display distinct rhythmic patterns at 2;06 → early separation of speech rhythm begins before 2;06

- A bias towards syllable-timing in younger children, especially evident in monolingual English between 2;06 and 3;0

- Monolinguals
  - Already display distinct rhythmic patterns at 2;06 → early separation of speech rhythm begins before 2;06

- Bilinguals
  - Rhythmic patterns of the two languages are more similar
  - Weaker trochaic pattern in bilingual English, possibly influenced by Cantonese which has no lexical stress
  - Increased Cantonese influence from 2;06 to 3;0
  - Evidence for mutual influence between the two languages, supporting a distinct developmental path for bilingual

Discussion

- More longitudinal rhythmic development of both monolingual and bilingual children are needed

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