Developing speech recognition materials suitable for non-native speakers

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Problems with existing material sets
- Too difficult for lower proficiency NN participants
- Small set sizes – limits number of experimental conditions
- No control of contextual constraint

So developed this new set of materials
- Suitable for B1 level NN participants
- 439 sentence triplets
- 3 conditions with varying contextual constraint

Vocabulary:
- PET exam
- Type C
- Type B
- Type A

Sentence Structure and Conditions
- Sentence context
- Final Keyword
- Example

<table>
<thead>
<tr>
<th>Type A</th>
<th>Highly constrained</th>
<th>Type B</th>
<th>Weakly constrained</th>
<th>Type C</th>
<th>Highly constrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Keyword</td>
<td>Highly predictable</td>
<td>Neutral</td>
<td>Anomalous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td>The dolphins are swimming in the sea.</td>
<td>The children are playing in the sea.</td>
<td>The dolphins are swimming in the road.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pointer words establish contextual constraint
- Types A & C ≠ Type B
- Types A & B ≠ Type C

Selecting potential final keywords
- Identify nouns on PET vocabulary list
- Remove if:
  - too rare
  - multi-word noun
  - figurative
  - emotional abbreviation
  - different male/female forms

Stages in Development
- Type A: Create contextually constrained sentences ending in potential keywords
- Type B: Adapt sentence only
- Type C: Exchange keyword only

Type A: predictable
- check predictability: cloze test
- adapt close test (native and proficient non-native)
- >67%

Type B: close test
- B1 level non-native
- <37%

Type C: exchange keyword only
- adapt close test (native and proficient non-native)
- choose different initial phonemes

439 equivalent sentence triplets
- Assign sentence triplets to lists:
  - 1 training list of 7 sentences
  - 18 lists of 24 sentences

Ensuring matching across types and lists
- Syllable count
- Lexical frequency
- Phonological neighborhood density
- Predictability: Cloze test
- Final set complete

Smaller list properties
- Within sentence types, all lists equivalent on average keyword and sentence properties after minor redistribution of sentences between 4 lists due to word count differences

References