DEVELOPMENT OF A PEDIATRIC VOWEL-DISCRIMINATION TASK

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ABSTRACT

The importance of vowel perception has been studied extensively in adults. However, less is known about vowel perception in children. To better understand the importance of vowel discrimination in young children, an easy to administer, pediatric vowel discrimination task is needed. Closed-set, picture pointing paradigms such as the Word Intelligibility by Picture Identification (WIPI; Ross & Lerman, 1970) are effective for pediatric word discrimination tasks (ASHA, 2012). Most WIPI word sets share a vowel but vary by initial and/or final consonant, such that discrimination relies on consonant information. The goal of the current project was to develop a companion test to the WIPI that relies on vowel information. The task includes monosyllabic words arranged in sets of three. The words within each set vary only by central vowel and are within the lexicon of a typically developing young child. Words are separated into three lists balanced for vowel articulation (i.e., position of tongue and degree of lip rounding), word frequency, and imageability difference. Preschool children easily, the images and audio recordings that were created to depict the words.

BACKGROUND & RATIONALE

• The importance of vowel perception to intelligibility has been studied extensively in adult populations.

• Less is known about vowel discrimination in young children.

• Testing speech intelligibility with young children is more complicated than testing adult listeners.

• Tests are sometimes limited to pictorial representations of words or same/different paradigms.

• Closed-set, picture-pointing paradigms are effective for pediatric word discrimination tasks (ASHA, 2012).

PURPOSE

GOAL 1: Develop a forced-choice, picture-pointing test of vowel discrimination.

1) Target words should be easily imaged
2) Target words should be within a young child’s lexicon
3) Sets of target words should phonemically vary only by central vowel

GOAL 2: Revised-WIPI

1) Create new images and audio recordings for WIPI in a similar artistic style and using the same talker as new task
2) Reduce WIPI word sets from four to three that do not vary in central vowel

TEST DEVELOPMENT

GOAL 1: Vowel-discrimination task

Target Words

• Target words are 75 monosyllabic words present in an online database based on child corpora of spoken English (Storkel & Hoover, 2010).

• Selected words included 25 sets of 3 word pairs that varied in central vowel only.

• Phonetic & Lexical Balancing

Lists were balanced for phonetic distribution as well as lexical frequency. Median lexical frequency, phonological neighbors, and imageability data are shown below.

<table>
<thead>
<tr>
<th>Vowel-Discrimination Task</th>
<th>List 1</th>
<th>List 2</th>
<th>List 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical Frequency</td>
<td>28</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>Phonological Neighbors</td>
<td>24</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td>Imageability (100-700)</td>
<td>576</td>
<td>567</td>
<td>551</td>
</tr>
</tbody>
</table>

GOAL 2: Revised-WIPI

Original 4-word WIPI sets were narrowed to 3 words using a combination of data from Dengerink et al. (1988), which reported spontaneous identification of original WIPI pictures, and authors’ judgment.

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<table>
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<tbody>
<tr>
<td>Lexical Frequency</td>
<td>56</td>
<td>29</td>
<td>61</td>
</tr>
<tr>
<td>Phonological Neighbors</td>
<td>17</td>
<td>18</td>
<td>18</td>
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</tr>
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</table>

CONCLUSIONS

Selected words and images created for the vowel-discrimination task were easily identified by a pediatric population. Results from the open- and closed-set identification tasks indicate that the new task is more difficult than the revised-WIPI. This result is not surprising due to limitations in target word options (i.e., sets of three words that varied only by central vowel and could be imaged within a child’s lexicon). It is intended that this task be used to further our understanding of auditory development with respect to vowel discrimination.

FUTURE DIRECTIONS

• Collection of perceptual data in normal-hearing listeners is forthcoming.

• Vowel-discrimination testing will be evaluated in children in competing noise (including steady state and modulated maskers).

REFERENCES


ACKNOWLEDGEMENTS

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