“Speech, Spoken Language and Ling: We Can!”

Alexander Graham Bell Association
Accelerating Progress, Advancing Opportunity
Colorado, July 1, 2016

Ling Model of Speech Assessment and Teaching
Knowledge Session by members of the
Ling Consortium International
Learning Objectives

1. Describe aspects of the Ling Model of speech assessment and teaching and global applications.
2. Understand the use of the Ling PLE (Phonetic Level Evaluation) and modifications globally.

Ling Consortium

• International consortium of professionals
• Developing and delivering globally recognized university-based courses on teaching listening and spoken language
• Focused on bringing speech and hearing to children with hearing loss
• Enabling a life of abundance
• Named in honor of the foundational work and extraordinary contributions of the late Dr. Daniel Ling, O.C., a pioneer of Auditory-Verbal practice for children with hearing loss.
Global Vision:
Children and adults with hearing loss will reach their full potential through listening and speaking.

Global Mission:
The Ling Consortium is helping more children to speak and hear thanks to a coordinated worldwide effort.

Who was Dr. Daniel Ling?

- One of the pioneers of listening and spoken language for children with hearing loss – **Auditory-Verbal** practice.
- Audiologist and internationally recognized authority on teaching speech to children who are deaf/hard of hearing.
Major Contributions

**Ling Six Sound Test:** m, oo, ah, ee, sh, s,
Determine access to sounds across the speech spectrum (Speech Banana)

**Phonetic Level Evaluation**

**Phonologic Level Evaluation**

**Speech Teaching System** based on speech acoustics, prerequisite speech skills, practice and carryover into spoken language

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**The Ling Speech Model**

- Theoretical framework
- Order for assessment and teaching
- Specific speech teaching strategies
- Strategies related to speech acoustics
- Emphasis on listening as the primary modality for learning spoken language

**GOAL: Oral Communication**
The Ling Thing

40 years of Ling

• Addressed the link between Speech Perception and Speech Production
• Children SPEAK the way they HEAR
• Evaluate both what they can HEAR and what they can SAY

Evaluating what the child can hear
Assess Auditory Access:
Ling Six Sound Test

• The Ling Six Sound Test has been adopted globally and...
• Has been adapted into different languages to account for speech acoustic differences Indicate website.
• ALBERTA YOUTUBE VIDEO – excellent description and how to administer
The Ling Six Sound Test

mmm

ooo

eee

shh

sss

ahh

Speech Banana or Speech Bean

The Six Sounds on the Speech Banana represent
• Frequency range of all speech sounds

The placement of the Speech Banana on the audiogram represents
• Loudness of conversational speech at 2 meters (6 feet)

ADD PICTURE OF AUDIOGRAM WITH BANANA?
Speech Banana five sounds

Common sounds audiogram
Evaluating what the child can say

TWO LEVELS of ASSESSMENT

• Phonetic Level (syllables)
• Phonologic Level (how the child uses speech sounds in words, phrases and sentences)

Ling’s 7 Stage Model: Phonetic & Phonological Levels (English)
Ling Speech Model: Who for?

**Use with late starting child**
- Originally a remedial, hierarchy of speech teaching with older children
- Now, can be used effectively with children in countries where early identification not common.
- Also, to plan for teaching children who are D/HH with additional challenges

**Use with early starting child**
- Can be used to track speech development with children who are identified early who are learning speech more typically.

Ling Speech Model Framework

1. Assess auditory capacity and optimize auditory access to spoken language.
2. Assess phonetic level speech production of:
   - Suprasegmentals
   - Vowels
   - Diphthongs
   - Consonants
   - Word initial & word final blends
3. Assess phonologic speech ability
4. Establish a reasonable set of targets based on Ling principles.
5. Plan auditory based speech sessions: phonetic and phonologic practice
6. Carryover speech production practice into everyday living situations, preschool and school settings
Ling Framework for Speech Production Assessment

**Phonetic Level**

More than standard articulation test
Assess in syllables – why?
Imitation of the adult – why?

**Phonologic Level**

- Assess speech production ability in connected speech
- Chit chat
- Story
- Explanation
- Etc – more here

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**Ling Principles: Assess for Automaticity at Phonetic Level**

- Ling speech model based on concept of motor speech production theory, *syllable* is the basic unit of speech

**Automaticity in Production:**

- Accuracy of speech sound production
- Rate of at least 3 syllables per second
- Economy of effort
- Flexibility moving from sound to sound
Ling System - Assessment and Development of Speech Sounds (Remedial)

Vocalization: spontaneous / on demand

Suprasegmental Patterns:
Duration, Intensity, Pitch

Vowels and Diphthongs

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/</td>
<td>hot</td>
<td>“aw” saw</td>
<td>/ae/ hat</td>
</tr>
<tr>
<td>/i/</td>
<td>bee</td>
<td>“oi” boy</td>
<td>“uh” cup</td>
</tr>
<tr>
<td>/u/</td>
<td>two</td>
<td>/E/ bed</td>
<td>/o/ boat</td>
</tr>
<tr>
<td>/au/</td>
<td>cow</td>
<td>/U/ book</td>
<td>/a/ dog</td>
</tr>
<tr>
<td>/ai/</td>
<td>pie</td>
<td>/I/ pig</td>
<td>/ei/ cake</td>
</tr>
</tbody>
</table>

Ling System - Assessment and Development of Speech Sounds (Remedial)

Consonants

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>b/p</td>
<td>d/t</td>
<td>g/k</td>
<td>voicing</td>
</tr>
<tr>
<td>stop b/p</td>
<td>stop d/t</td>
<td>stop k/g</td>
<td>b - p</td>
</tr>
<tr>
<td>w (wh)</td>
<td>/j/ (y)</td>
<td></td>
<td>d - t</td>
</tr>
<tr>
<td>h</td>
<td>l</td>
<td>r</td>
<td>g - k</td>
</tr>
<tr>
<td>f/v</td>
<td>s/z</td>
<td>ch/dg</td>
<td>f - v, th - th</td>
</tr>
<tr>
<td>th/th</td>
<td>sh/zh</td>
<td></td>
<td>s - z, sh - zh</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
<td>ng</td>
<td>ch - dg</td>
</tr>
</tbody>
</table>

Initial Consonant Blends > developed concurrently
Final Consonant Blends
Setting Speech Goals:  Speech Target
Summary

Suprasegmentals
Vowels & Diphthongs
Step 1 Consonants
Step 2 Consonants
Step 3 Consonants
Step 4 Consonants
Initial Blends
Final Blends


Ling Principles: Feedforward

• Assessing and teaching to automaticity establishes good feedforward mechanisms

• Essential for fluency and good intelligibility
Ling Principles: Speech Remediation

Simple to difficult:
• know the relationship of families of speech sounds and speech acquisition)
• prerequisite phonetic level skill is required before more difficult sounds can be mastered.

Known to unknown:
• use well produced speech sounds that are close to target to facilitate learning – Ling called this SET teaching

Stages of Practice

/s/
• /s/ - isolation
• /as/ - final in syllable
• /as-as-as/ - repeated syllable
• /asasas/ - medial position in connected syllables
• /asasasaS/ - initial position created (change of timing/emphasis – release the vowel)
• Practice in words and phrases
Adapting the PLE into other languages: parents as local experts

GLOBAL PERSPECTIVES ON LING MODEL AND FRAMEWORK FOR ASSESSING AND TEACHING SPEECH

Adapting the PLE into other languages

Research consonant/vowel system of language
2. Review PLE with parent to compare phonemes
   – Do you have this sound or one like it?
   – Do you have any other sounds not listed?
3. Revise PLE for target language
4. Guide parent to conduct PLE, using parent’s expert judgments to rate accuracy & choose targets
5. Demonstrate strategies to parent for follow through

Mary McGinnis, JTC
Use of Ling Frameworks
John Tracy Clinic

- Speech acquisition data for this language...
- Model in use currently
- Forward planning and desired changes
- Issues

Ling Six Sound Test Adaptations for

- Image or sounds equivalence
- How personnel trained
- Parents trained to use
- Any research?
How is Phonetic Level Evaluation accomplished?

- Ling PLE adaptations or other instrument

Phonologic Evaluation

- How accomplished?
- Who does it?
Target setting and teaching strategies - Ling Principles

Case Study Example from program X

- Demonstration of speech production assessment
- Targeted sounds
- Demonstration teaching
- ** Can bring a problem to share with all for brief discussion.
PROGRAM SnapSHOT : INDIA

AURED - INDIA
Why we use Ling

- It encompasses Multiphase speech teaching
- Auditory – Visual – Kinesthetic (when necessary)
- Supports the oral tradition
- Most effective for the underprivileged, who can’t afford implants (in developed countries implants are free)
- It emphasizes Phonetic to phonologic development.
- Children with Multiple challenges
- Late diagnosis - Since New born screening is not mandatory in developing countries intervention is delayed due to late diagnosis

Process for adapting / modifying Ling

- Ling’s Phonetic Evaluation has been adapted and modified for additional consonants unavailable in the English Language.
- Indian languages have heavily aspirated consonants and this changes the place and manner of production as compared to the ones in English.
- Accordingly they have been repositioned in the speech banana.
Outreach

- One of the many benefits of the Six Sound Test is that it can be used by anyone; audiologists, speech language pathologists, teachers and parents.
- It can be used with hearing aids, cochlear implants, or no amplification at all.

The Aziza Grid—a tool for habilitation.

- Lack of tools to explain complex terms of mapping parameters.
- Ling’s principles have been incorporated into the Aziza Grid and serves several purposes.
- Developed primarily to give a visual picture of the map and to enhance communication amongst audiologist/therapist/teacher and parent.
- Shows correlation between frequencies represented in each electrode and Ling’s Acoustic phonetic parameters. It also tracks speech perception progress post implant activation and provides guidelines for setting appropriate auditory goals.
- Helps with Trouble-shooting.
Maps may vary due to the category the candidate falls into:
- Adults, pre-lingual, post-lingual, older children, infants, anatomical deformities, medical
- side effects
- After each Map, a child's T and C levels should be transferred to the Grid
- Auditory goals should be targeted with a diagnostic approach

Tracking over 5 weeks post switch-on
This Grid has been developed for Nucleus, Advanced Bionics and Medel maps. The Aziza Grid for Nucleus maps is available at the AG Bell bookstore in a set of DVDs - ‘Need to Know’

Authors:
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• Allison Beiver
• Aziza Tyabji Hydari

PROGRAM SNAPSHOT:
SOUTH KOREA
Why we use Ling

• Hearing impairment is an invisible problem, but it becomes visible when speech comes along.
• Speech abilities in our children with hearing prostheses vary.
• In Korea, speech correction for children with hearing impairments has been a core element of the intervention contents for them.

Challenges/ considerations in adapting / modifying Ling

• Different phonetic distribution in Korean compared to English
  – Three way laryngeal distinction of plosive sounds(stops)
  – Unvoiced sounds become voiced sounds between voiced sounds
Because three way distinction of stops are based on laryngeal vocalization types, control of voice and phonetic and phonologic approaches in Ling’s methods are very effective to the acquisition of stop sounds in Korean.

Conclusion

• Plosive sounds (stops) consist of 63% of Korean Consonants
• 3-way distinction of stops and vocalization processing between voiced sounds are one of the hardest phonological processes of Korean speech sounds for the children with hearing impairment
• Ling’s methods can be effective tools for the acquisition of these sounds in Korean speech
SURVEY - Your turn!

• Please let us know how you are using or adapting the Ling Six Sound Test in other languages.

• Please let us know how you are using or adapting the Ling Speech Evaluations and Ling Speech Teaching Model in other languages.

• What other presentations would you like to see from the LING consortium?

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