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Practice in Child Phonological Disorders: Tackling some Common Clinical Problems

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Practice in Child Phonological Disorders: Tackling Some Common Clinical Problems

ASHA Convention, 2008
Chicago, IL

• This document contains copies of the slides and handouts that were used in the panel discussion. They are in the order of their presentation.

Topic and Goals

• Child phonology
  - One of the most common communication disorders seen by school-based SLPs (ASHA, 2008)

• Complex to evaluate and treat
  - many different options
  - individual clinicians may focus on all or a few

• Phonology
  - used here in it’s linguistic sense
  - a general term that includes all aspects of speech sound production / disorders

Goals

• Identify areas of child phonology that clinicians have difficulty with

• Help them in these areas

Overview

• Survey
  - 38 Clinical SLPs
    - Questions about phonological assessment and intervention
    - Data analyzed to reveal 3 major themes

• Panel Presentations
  - Each presenter assigned a topic area
    - Talk for 20 minutes on concepts within the topic

  - Questions and ideas from you

Presenters

• Tim Brackenbury
  - Bowling Green State University

• Lynn Williams
  - East Tennessee State University

• Benjamin Munson
  - University of Minnesota

• Gregory Lof
  - MGH Institute of Health Professions

• Marc Fey
  - University of Kansas

Survey

• Developed to
  - Guide this presentation
  - Plan for a day-long workshop
  - Assist in teaching graduate students

• Methods
  - Emailed to child-based SLPs across Ohio
    - Listservs
    - Educational Service Centers
Survey

- Participants
  - 38 respondents
    - Emailed their answers
    - No demographic data

- Analysis
  - Responses copied into a spreadsheet
    - Divided by individual ideas
      - 157
    - Color coded by question

Survey

- Ideas printed and sorted into themes and sub-themes
  - Doctoral student and myself
  - Sub-themes checked by another doctoral student

Major Themes

I. Time
   - Ways to do more with the limited amount of time available
     - Assessment
     - administration and scoring
     - child's attention
     - Intervention
     - availability
     - interruptions

II. Knowledge
   - Need for increased information on a range of topics
     - Clarification of terms
     - Assessment tools
     - Selecting targets for therapy
     - Treatment for specific disorders and/or error types

III. Effectiveness and efficiency
   - Getting the most information/change in the shortest amount of time
     - Selecting the best approach for each child's profile
     - Assessment procedures that directly lead to treatment
     - Improving parent/teacher involvement and carryover to other contexts

Panel Format

- Division of Labor
  - Each presenter will discuss a different topic
    - General ideas about assessment
    - Specific aspects of assessment
    - General ideas about intervention
    - Specific aspects of intervention

- Mindfulness of the themes
  - Time
  - Knowledge
  - Effectiveness and efficiency
Practice in Child Phonological Disorders: Assessment Issues

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2 Primary Assessment Issues

Time for Assessment
- Need for something that is effective and efficient
- Transcription
- Scoring

Test Selection
- Best for phonological analysis
- Appropriate for different populations
- Assessment tools for younger children

Purpose of Assessment
- Assessment provides information regarding child’s development relevant to age peers and determines whether or not there is a delay/disorder
  - 2 types of tests
    - Sound inventory tests
    - Pattern tests
      - Based on construct of phonological processes
  - Usefulness in planning intervention is limited

Phonological Analysis
- Can be completed on test data, probes, conversational samples
- Different analysis frameworks
  - Relational “error” analyses
    - SODA
    - Phonological process analysis
    - P-V-M analysis
  - Independent analyses
    - PFK (phonological knowledge relative to adult)
    - SPACS (phoneme collapses that map child:adult sound systems)
- Used to identify error patterns, phonological rules
  - Discovering the “order in the disorder”
  - Helpful in selecting intervention targets and planning therapy

Importance of Assessment and Analysis

Our intervention is only as effective as our analysis is thorough and accurate (Gierut, 1986)
Effective and Efficient: Linking Assessment with Analysis

- How can we combine the need to complete standardized testing with importance of designing intervention?
  - And do it effectively and efficiently?
- Let’s look at an example of Adam, age 4:6
  - GFTA
  - Relational Analysis (PVM)
  - Independent + Relational Analysis (SPACS)

What information do we have from GFTA results?

- We know that Adam has a speech disorder
  - Adam produced 44 errors out of 77 targets assessed (57% errors)
  - Fell at 5th percentile with a standard score of 68 and age equivalent of 2 years, 2 months
- But what do we know about:
  - Predominant error patterns?
  - How to structure intervention to get the greatest change?

What information does the PVM analysis provide?

- Although Adam has a number of sound errors, his phonetic inventory is not that limited
  - Majority of his errors occur word-initially
- He has the most difficulty with the following classes of sounds or sound sequences:
  - Fricatives
  - Clusters
  - Affricates and liquids
  - Anterior stops
  - He has a sound preference for /g/
What information does SPACS provide?

- Although we see the sound preference for /g/, we can see how extensive this error substitute is
- Further, we can see the “order in the disorder”
  - Adam’s substitution of /g/ across stops, fricatives, and affricates [OBSTRUENTS] and clusters that contain a non-continuant consonant
  - Adam’s error substitute of /w/ for target liquids and glides [SONORANTS] and clusters that contain continuants

Comments on Transcription and Scoring

- Obviously, more information is gained from whole-word transcription
  - But if you don’t have the time, you can still gain a lot of information by transcribing the child’s production for the tested phoneme
  - +/- scoring system provides little useful information other than number of errors

Time for Assessment

- It’s important
  - To qualify children for services
  - Need to do it at least annually to update intervention plan
  - Need to move away from debate of “more testing” versus “less testing”
  - Smarter testing

Test Selection

- Different tests for different purposes
  - Good “all purpose” test is a sound inventory test, such as the GFTA-2
  - Can complete phonological analysis on test responses
  - Easy to administer, commonly used
  - Can be used with different populations (e.g., deaf children) to obtain a phonetic inventory
  - Interpret with caution
  - Supplement with informal measures, samples, probes
- Assessment tools for earliest ages
  - Broad-based measures that sample different syllable structures and range of consonants (PVM) in initial and final positions
  - Use toy manipulatives rather than illustrations

Summary

Administer sound inventory test (e.g., GFTA-2) | Minimally transcribe child’s response for tested sound | Complete phonological analysis on test items | Find the “order in the disorder” | Select targets and design intervention
Conclusion

Even with error transcriptions on standardized test, can complete phonological analysis to gain insight on child’s sound system and design effective intervention program

Work SMARTER, not HARDER

Recommended Reading

AJSLP Clinical Forum (2002)
“Perspectives in the Assessment of Children’s Speech”

- 6 different perspectives on assessing a child within 60-90 minutes
- Natural Phonology (Tyler & Tolbert; Hodson, Scherz, & Strattman; Khan, 2002)
- whole-language perspective (Hoffman & Norris)
- “phonomotor” perspective (illele)
- integrated perspective (Miccio)
# Phonological Analysis Summary and Management Plan

*(after Baker, 2004)*

<table>
<thead>
<tr>
<th>Position</th>
<th>Phoneme Collapses (3 predominant across positions)</th>
<th>Phonological Processes (3 predominant across positions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORD-INITIAL</td>
<td></td>
<td></td>
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<tr>
<td>WORD-FINAL</td>
<td></td>
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<tr>
<td>WORD-MEDIAL</td>
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</tbody>
</table>

Vowel Errors? Yes / No

Patterns? Backing Fronting Centering Tensing

Inconsistent errors

Word inconsistency Phoneme Inconsistency

Prosody errors

Increased errors in multisyllabic words

Increased errors in conversation than in single words

Stimulable for sounds OUT of phonetic inventory?

List stimulable sounds: __________________________________________

List non-stimulable sounds: ______________________________________
**ADDITIONAL INFORMATION:**

Child’s motivation: High / Low

Language impairment? Yes / No

Expressive language impairment? Yes / No

Receptive language impairment? Yes / No

Phonological Awareness Deficit / Reading Difficulty? Yes / No

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### 2. CLINICAL IMPRESSIONS

<table>
<thead>
<tr>
<th>Differential Diagnosis</th>
<th>Classification</th>
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<tbody>
<tr>
<td>Phonological Impairment (PI)</td>
<td>SD-DPI</td>
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<tr>
<td>PI only</td>
<td>SD-OIE</td>
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<tr>
<td>PI/LI</td>
<td>Other ___________________________</td>
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<tr>
<td>expressive / receptive / both</td>
<td></td>
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<tr>
<td>phonological awareness / literacy</td>
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<tr>
<td>Articulation Impairment (AI)</td>
<td>SE</td>
</tr>
<tr>
<td>AI</td>
<td>SD-gen Specify: ___________________</td>
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<tr>
<td>AI Residual Errors</td>
<td>Other ___________________________</td>
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<td>AI Compensatory Errors</td>
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<td>Motor Speech Disorders (MSD)</td>
<td>SD-AOS</td>
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<td>CAS</td>
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<td>Dysarthria</td>
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### 3. TARGET SELECTION

<table>
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<th>Target Selection Approach</th>
<th>Intervention Target(s) / Position(s)</th>
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<td>Phonological Complexity</td>
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### 4. INTERVENTION APPROACH

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<th>Approach</th>
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<td>Minimal Pairs</td>
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<td>Multiple Oppositions</td>
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<td>Empty Set</td>
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<td>Approaches for Young Children (2-4 years)</td>
<td>Stimulability Approach</td>
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<td>Cycles</td>
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<td>PACT</td>
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<td>Phonological Awareness / Literacy</td>
<td>Metaphonological Approach</td>
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<td>Psycholinguistic Approach</td>
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<td>Integrated Intervention Approaches</td>
<td>Morphophonemic Phonological Approach</td>
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<td>NSIT</td>
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<td>Neuro-Networking</td>
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<td>Non-Linear Phonological Approach</td>
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<td>Phonetic Intervention Approaches</td>
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<td>Nuffield Dyspraxia Approach</td>
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<td>Traditional Articulation Approach</td>
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<td>Other</td>
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### 5. EVALUATION PLAN

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<th>Frequency</th>
<th>Criterion</th>
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<tr>
<td>conversational sample</td>
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</tbody>
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Speech-Language Pathologist: ___________________________ Date: ________
Old Concept, New Relevance

Why should we care about speech perception ability?
I will talk about it relative to the three themes that emerged in Tim's survey:
- Knowledge
- Time
- Effectiveness and efficiency

Old Concept, New Relevance

What leads me to talk about this?
- First, it's a topic that I know quite a bit about, and it's one about which I think there are quite a few misconceptions.
- Second, it addresses some of the comments received in Tim's survey:
  - "practice use of newer tools for assessment, current best practice based on solid research, related assessments such as oral-motor evaluation, essential need for hearing evaluation."
  - "Additional methods of addressing treatment needs"
  - "Their auditory discrimination ability, their stimulation of the improved or corrected sound and their ability to obtain a large number of responses."
  - "A short overview of what researchers are currently studying in regards to phonological intervention."

Speech Perception: Knowledge

Let's define our terms first:
- Identification: can the child associate the correct set of labels with a phoneme (i.e., can the child associate the appropriate range of fricative noise with /s/ and the right range with /ʃ/)?
- Discrimination: can the child tell two sounds apart?

Speech Perception: Knowledge

Word Recognition: ability to recognize words (often in challenging conditions, such as in the presence of competing noise)
One term we won't talk about: auditory processing
- This term is too general for this discussion

Speech Perception: Knowledge

Speech perception affects production in many different ways
- Children aren't born with the knowledge of how a language sounds, or what they need to do with their tongue/lips/jaw/etc. to make sounds
Speech Perception: Knowledge

• The targets for speech production are auditory representations in long-term memory.
  • We say what we want to hear
  • We learn how to speak, in part, by learning how we should sound

We achieve these perceptual targets through our knowledge of the articulation-to-acoustic map
• We know how the many different ways to make the sounds we want to hear
• We learn to speak, in part, by practicing the many different ways to produce the sounds we hear

To make the low second-formant frequency in the vowel /u/, I can either round my lips or move the root of my tongue back
To make the low third-formant frequency for /r/, I can either curl my tongue back or bunch my tongue root

We use feedback to learn the association between articulation and acoustics, and to guide our ongoing speech production

Speech Perception: Knowledge

• The consequence of an impairment in one or more of these is inaccurate speech production
  – The errors that children make are the consequence of an impairment in one or more of the ‘ingredients’ of speech production.
  – The articulatory errors themselves might reinforce the perception problem.

A deficit in perception can...
  – Prevent the child from knowing what sounds ought to sound like
  – Hinder the child from learning the relationship between articulation and acoustics

Perception problems are reliably found to co-occur with production problems.
  – Representative work on this includes Munson, Edwards, and Beckman (2005 JSLHR);
  – Edwards, Fox, and Rogers (2002 JSLHR);
  – Munson, Baylis, Krause, and Yim (2006 Conference on Laboratory Phonology, available if you send me an E-Mail); and Rvachew and Grawburg (2006, JSLHR)
Speech Perception: Knowledge

• Ergo, it is important to assess the status of a child's speech perception, and potentially to provide remediation for deficits in perception.

Speech Perception: Time

• What would an ideal speech-perception tool look like?
  • It should use natural speech—the kind of speech that children produce and perception in their daily lives
    – It wouldn't rely on clinicians' renditions of children's errors
    – It doesn't rely on the hyper-articulated productions used in conventional 'auditory bombardment' protocols.
    – (Those samples were taken from Jan Edwards and Mary Beckman's *Pardologo* database)
  • An ideal tool would involve natural tasks, like identification, rather than artificial tasks like discrimination.
    – Rarely is the child presented with two speech tokens and asked to judge whether they are the same or different.
    – Same/different tasks in general might be hard for a child.
  • It should be easy to administer, to score, and to interpret

Speech Perception: Time

• These are all incorporated in the SAILS tool, developed by Susan Rvachew
  • [http://www.avaaz.com/clinicaltools/usingsails.htm](http://www.avaaz.com/clinicaltools/usingsails.htm)
• SAILS costs about $450.00.

Speech Perception: Time

• SAILS uses natural productions by children and adults, and has many assessment modules for different sound contrasts

Speech Perception: Time

• Another possibility: Locke's (1980) procedure
  • Imagine that you find a child who has a [w] for /r/ substitution.
  • Find three objects whose names are minimal triplets (i.e., differ only in one phoneme), and which contain the:
    – Target sound (e.g., /r/)
    – Substituted sound (e.g., /w/)
    – Control sound (e.g., /d/)
Speech Perception: Time

- Ask the child “is this an X”
  - Is this a rip? Is this a whip? Is this a dip?
  - Pair all of the questions with all of the pictures (i.e., there are 9 possible questions). Randomize the order, and don’t just ask each question-picture combination only once.
  - Tally the correct and incorrect responses

Speech Perception: Time

- This procedure isn’t perfect…
  - It presumes that the clinician’s productions are faithful renditions of the child’s productions.
  - It counts don’t correct for ‘false alarms’.
  - …but it doesn’t cost $450.00

Speech Perception: Effectiveness and Efficiency

- A variety of intervention studies by Susan Rvachew and colleagues has shown that incorporating SAILS’s perception-training modules to production training leads to better progress than is achieved through production-training alone.
  - This is true regardless of the therapy type that the perception training is paired with.

Speech Perception: Effectiveness and Efficiency

- In the SAILS intervention modules, listeners hear a natural token and see either a picture or an “X.” They click on the picture if it’s correct and the “X” if it’s not. They are given feedback.
Speech Perception: Effectiveness and Efficiency

- It is possible, with a cheap recorder and free images, to mock-up something like this.
- In an in-service I did in the Chanhassen, MN public schools, we made the following tool to enhance the perception of /s/ and /ʃ/.

/s/ - /ʃ/

Forced choice with feedback
Speech Perception: Effectiveness and Efficiency

- It remains to be seen whether these kinds of interventions would improve speech-production performance as reliably as SAILS does, but given the impressive gains that SAILS shows, it seems likely that it would help children in therapy.

Conclusions

- Knowledge: Speech perception is a critical component to speech-sound acquisition and speech-sound knowledge.
- Time: With the right tools, a child's speech perception ability can be assessed and treated in therapy.
- Efficacy and effectiveness: speech perception training enhances speech-production outcomes.

Questions

- Ask away!
- I'm at Munso005@umn.edu
- Disclaimer: I have no financial interest in SAILS, though I am actively collaborating with Susan Rvachew
Some Treatment Approaches

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Therapy Approaches

- Traditional Therapy
- Minimal Pairs
- Maximal Pairs
- Multiple Opposition
- Metaphon
- Metaphonological (Van Riper)

Traditional Articulation Approach

This is probably the most widely used approach for changing speech sound productions.
This motor approach may be used inappropriately for children with phonological errors.

Phonological Therapy Approaches
**Minimal Pairs**

**Also known as...**
- Minimal Opposition
- Contrast Therapy

**Minimal Pairs**
- Use pairs of words that differ by one phoneme only
- Used to establish contrasts not present in the phonological system
- Usually words are selected with one word as the target, the other as the replacement
- Child should be stimulable for correct target sound

**Minimal Pairs**
- Have child say both words in the pair
- Show a communicative confusion if both words are said the same
- Use objects that can be manipulated (not only pictures)

**Minimal Pairs**
- Works best if child is able to motorically produce the target sound
- Can be used for a variety of disorder types when showing confusing can help children understand WHY a change in speech production changes meaning

**Minimal Pairs**
- bow
- boat
Maximal Pairs

Also known as...
Maximal Opposition Therapy

Word pairs have multiple feature contrasts (maximal oppositions).
Features can differ on place, manner, and voicing.
The oppositions contrast only two sounds.
The target sound is compared to a maximally different one.

<table>
<thead>
<tr>
<th>m</th>
<th>s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal</td>
<td>Oral</td>
</tr>
<tr>
<td>Voiced</td>
<td>Voiceless</td>
</tr>
<tr>
<td>Non-Strident</td>
<td>Strident</td>
</tr>
<tr>
<td>Anterior</td>
<td>Posterior</td>
</tr>
</tbody>
</table>

Suppose a child produces /ʃ/.
Minimal Pairs:
top/shop, tip/ship, two/shoe.
Maximal Pairs: Contrasted with maximally opposed sound from /ʃ/ (perhaps /m/).
For example:
moo/shoe; me/she; Mack/shack.

Best used for moderate/severe children (very unintelligible).
Meant to change the child’s entire phonological system.
Best for children with severely limited phonetic inventory.
Should be stimulatable for missing sounds.
Multiple Oppositions

Approach

- Much like minimal pairs, but pairs all or most errors simultaneously
- Good approach if child substitutes a single sound for multiple sounds
- Child confronts the rule using multiple contrasts
- For example: /t/ for /s, k, tʃ, tr/

Multiple Oppositions

- t
  - s
  - k
  - tʃ
  - tr
- tip
  - sip
  - kip
  - chip
  - trip

Multiple Oppositions

- t
  - s
  - k
  - tʃ
  - tr
- tease
  - sees
  - keys
  - cheese
  - trees

Multiple Oppositions

- t
  - s
  - k
  - tʃ
  - tr
- two
  - Sue
  - coo
  - chew
  - true

Multiple Oppositions

- Best for children who have many homonyms
Metaphon Approach

Developed in the UK
Specifically teaches the child to focus on languages phonological details
Focuses on phonological awareness (a type of metalinguistic awareness)

Two Phases of Therapy

Phase 1: Developing phonological awareness
PURPOSE:
To capture the child’s interest in sounds and the entire sound system
HOW ACCOMPLISHED:
Teaching concepts of sounds (e.g., long/short, noisy/quiet) pair with sounds use minimal pairs to show meaning difference

Phase 2: Developing communicative awareness
PURPOSE:
To use concepts from Phase 1 but now the child produces
HOW ACCOMPLISHED:
Use procedures much like the traditional minimal pair approach
### Metaphonological Approach

- Intervention enhances early phoneme awareness and letter knowledge, combined with intervention to improve speech intelligibility.
- Work on intelligibility, phoneme awareness, and letter-name/letter-sound knowledge.

### Metaphonological Approach

<table>
<thead>
<tr>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phoneme blending</strong></td>
<td>(adult says: b—a—I, child says “ball”)</td>
</tr>
<tr>
<td><strong>Phoneme segmentation</strong></td>
<td>(adult says: “ball”, child says “b—a—I”)</td>
</tr>
</tbody>
</table>
| **Phoneme manipulation** | Say “boat” without the “t”  
What word would you make if you put “o” before “pen”? |

### Co-Occurring Language Deficits

- Alternating speech with language targets every other week
  - A speech goal is the focus for one week, then a language goal for the next week
  - Has shown to be greater gains in both speech and language following this alternating schedule

### Co-Occurring Language Deficits

<table>
<thead>
<tr>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Select bound morphemes** | That mark both tense and agreement  
e.g., “walked”, “hits” |
| **Use forced choice**    | “The man runs or jumps?”                                                     |

### Nonspeech Oral Motor Exercises

- NOT a therapy technique that has shown to be beneficial for bringing about speech sound changes
Nonspeech Oral Motor Exercises

Some Exercises From the Web:

Tongue Push-Ups
Objective: To strengthen tongue
Procedure: Child holds up an M&M, cheerio, etc. on upper ridge just behind teeth (not on teeth) and pushes up with tongue.

Tongue Pops
Objective: To strengthen tongue
Procedure: Suck tongue up on the top of the mouth, pull it back and release it, making a popping sound.

Pointy Tongue
Objective: To increase tongue movement and coordination
Procedure: Protrude tongue and point it at the tip.

Reasons Why They Don't Work:

Part-whole training and transfer
Breaking the speaking act down to meaningless small tasks will not transfer over to the complex task of speaking.

Strengthening the structures
Very little strength is needed for talking; probably aren’t increasing strength with the exercises; strength measurement is subjective and unreliable.

Relevancy to the act of speaking
Most of these exercises have movements that are irrelevant to the speaking task (e.g., tongue wagging).

Task specificity
Just because the same oral structures are used for speech and nonspeech, they function differently; speech is special and is different from nonspeech tasks.
Nonspeech Oral Motor Exercises

Reasons Why They Don’t Work:

Warm-up/Awareness/Metamouth
Children probably cannot make use of the awareness cues with these exercises;
Warm-up for speaking is not necessary because the speaking system is not being overly taxed.

Goal Attack Strategies

VERTICAL STRATEGY
One specific sound is worked on one at a time until criteria

Goal Attack Strategies

VERTICAL STRATEGY
For example, the Van Riper Traditional Approach

Goal Attack Strategies

VERTICAL STRATEGY
Production of /s/ in isolation
Goal Attack Strategies

**VERTICAL STRATEGY**

Production of /s/ in isolation
Production of /s/ initial, then final, then medial syllables
Production of /s/ in isolation

**HORIZONTAL STRATEGY**

More than one goal is treated simultaneously

**CYCLICAL STRATEGY**

Production of Final Fricatives:
/s/  /f/  /z/  /v/  /ʃ/
### CYCLICIAL STRATEGY

For example, Hodson’s Cycles Approach:

- A cycle is a period of time to treat all targeted patterns.
- Phonemes within targeted patterns are used to facilitate emergence of the pattern.

### Cycles Approach

#### Each pattern is targeted for 2 to 6 hours per cycle

- Each target phoneme within the pattern is facilitated for approximately 60 minutes.

The first cycle lays a foundation and allows children to have early success. Patterns are recycled during ensuing cycles until they begin to emerge in spontaneous speech.

#### Modified Cycles Approach

- A cycle is 3 weeks; 1 pattern per week
- 2 training sounds per pattern
- Emphasis is eliciting numerous correct productions in 5-10 carefully selected words

#### Example

<table>
<thead>
<tr>
<th>Week</th>
<th>Pattern 1</th>
<th>Pattern 2</th>
<th>Pattern 3</th>
<th>Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Target Sound 1</td>
<td>Target Sound 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Target Sound 1</td>
<td>Target Sound 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Target Sound 1</td>
<td>Target Sound 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Modified Cycles Approach

**Pattern 1**
Produce final consonants in words

**Pattern 2**
Produce back sounds

**Pattern 3**
Produce clusters

---

Modified Cycles Approach

**Pattern 1**
Produce final consonants in words
Sound 1: /z/
Sound 2: /t/

Modified Cycles Approach

**Pattern 2**
Produce back sounds
Sound 1: /k/
Sound 2: /g/

Modified Cycles Approach

**Pattern 3**
Produce clusters
Sound 1: /pl/
Sound 2: /kr/

---

Modified Cycles Approach

At end of 3 weeks, probe to determine emergence.

If sounds ≤ 50% correct, then recycle in words.

If sounds > 50% correct, then use in sentences.
Making Time in Phonological Intervention: Multiple Ways to Skin a Cat

Marc E. Fey, Ph.D.
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School of Allied Health
University of Kansas Medical Center
Kansas City, KS, USA
e-mail: mfey@kumc.edu
Some Details About Nora
Fey & Stalker (1986)

- Age: 6;9
- Mostly unintelligible in connected speech to all but her family
- Low average vocabulary comprehension and only slightly poorer grammatical comprehension
- Expressive grammar delay but not pragmatics
- History of otitis media and PE tubes
- Signs of mild oral and speech apraxia
- Believed by many to share a twin language with her brother
<table>
<thead>
<tr>
<th>Intervocalic Targets</th>
<th>Final Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>number → ['nʌhi]</td>
<td>group → [gwum]</td>
</tr>
<tr>
<td>lucky → ['lʌhi]</td>
<td>like → [l aɪŋ]</td>
</tr>
<tr>
<td>pencil → ['pɪho]</td>
<td>mad → [mædn]</td>
</tr>
<tr>
<td>balloon → [bə 'lun]</td>
<td>knife → [naɪn]</td>
</tr>
<tr>
<td>forget → [f ə 'ɡɪ]</td>
<td>here → [hɪ əŋ]</td>
</tr>
<tr>
<td>Betina → [beə 'tihe]</td>
<td>light → [l aɪɡ]</td>
</tr>
<tr>
<td>another → [ə 'nʌ hə]</td>
<td>lid → [lɪd] ~</td>
</tr>
<tr>
<td>people → ['piho] ~</td>
<td>[lɪd^n]</td>
</tr>
<tr>
<td></td>
<td>ball → [bɔŋ] ~</td>
</tr>
<tr>
<td>baby → ['behi] ~</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[be 'bi]</td>
</tr>
</tbody>
</table>
F & S’s Phonological Intervention Plan

**Basic Goals**
- Increase Intelligibility
- Foster Development of Phonological Awareness

**Intermediate Goals**
- Eliminate h-Replacement
- Eliminate Nasal Replacement

**Specific Goals**
- /l n t/s k b/

**Sub-Goals**
- NSS - Word - Phrase - Sentence

**Activities**
- Drill – Play
- Book Reading – Storytelling

**Goal Attack Strategies**
- Vertical - Horizontal - Cyclical

**Evaluation**
- Every 3-5 Weeks

**Intervention Context**
- Clinic - Home - Classroom
  - Intensity - 2X Week

**Intervention Agent**
- Clinician - Parent - Teacher
  - Intensity - 1.5 hrs

**Procedures**
- Traditional - Recasts - Minimal Pairs
- Paired Stimuli – Multiple Opposition
Nora’s New Intervention Plan: Clinician

Basic Goals
- Increase Intelligibility
- Foster Development of Phonological Awareness

Intermediate Goals
- Eliminate h-Replacement
- Eliminate Nasal Replacement

Specific Goals
- /l n t s k b/

Sub-Goals
- NSS - Word - Phrase - Sentence

Activities
- Drill – Play
- Book Reading – Storytelling

Evaluation
- Every 3-5 Weeks

Intervention Context
- Clinic - Home - Classroom
- Intensity - 1X Week

Procedures
- Traditional – Recasts – Minimal Pairs
- Paired Stimuli – Multiple Opposition

Intervention Agent
- Clinician - Parent - Teacher
- Intensity - 30 min

Goal Attack Strategies
- Vertical – Horizontal – Cyclical

Intermediate Goals
- Eliminate h-Replacement
- Eliminate Nasal Replacement

Specific Goals
- /l n t s k b/

Sub-Goals
- NSS - Word - Phrase - Sentence
Nora’s Intervention Plan: Parent

**Basic Goals**

*Increase Intelligibility*
*Foster Development of Phonological Awareness*

**Intermediate Goals**

*Eliminate h-Replacement*
*Eliminate Nasal Replacement*

**Specific Goals**

/ʃ n ʃ ʃ k b/

**Sub-Goals**

NSS - Word - Phrase - Sentence

**Activities**

Drill - Play
*Book Reading - Storytelling*

**Goal Attack Strategies**

*Vertical - Horizontal - Cyclical*

**Evaluation**

*Every 3-5 Weeks*

**Intervention Context**

Clinic - *Home* - Classroom

**Intensity**

*7X Week*

**Procedures**

Traditional - *Recasts* - Minimal Pairs
*Print Referencing - “ʃ”*

**Intervention Agent**

Clinician - *Parent* - Teacher

**Intensity**

*30 min*
Nora’s Intervention Plan: Teacher

**Basic Goals**
- Increase Intelligibility
- Foster Development of Phonological Awareness

**Intermediate Goals**
- Eliminate h-Replacement
- Eliminate Nasal Replacement

**Specific Goals**
- /l n t/s k b/

**Sub-Goals**
- NSS - Word - Phrase - Sentence

**Activities**
- Drill – Play
- Book Reading – Storytelling

**Goal Attack Strategies**
- Vertical - Horizontal - Cyclical

**Intervention Context**
- Clinic - **Home** - Classroom
- Intensity - 5X Week

**Intervention Agent**
- Clinician - Parent - **Teacher**
- Intensity - 10 min

**Procedures**
- Traditional - **Recasts** - Minimal Pairs
- **Print Referencing** - “l ch”

**Evaluation**
- Every 3-5 Weeks
Feedback and Questions

- What have we discussed today that can help your work with children who have phonological disorders?

- What additional ideas have you come up with during this session?

- What do you still have questions about?

Conclusion

- On behalf of the panel and the children with phonological problems that you work with

  Thank You!

  For
  - the Time that you have dedicated
  - the Knowledge that you share
  - the Effectiveness and Efficiency of the services that you provide