

1-1-2008

# Practice in Child Phonological Disorders: Tackling some Common Clinical Problems

Tim Brackenbury  
*Bowling Green State University*

Marc Fey  
*University of Kansas*

Gregory Lof  
*MGH Institute of Health Professions*

Benjamin Munson  
*University of Minnesota*

A. Lynn Williams  
*East Tennessee State University, williamsl@etsu.edu*

Follow this and additional works at: <https://dc.etsu.edu/etsu-works>

 Part of the [Speech and Hearing Science Commons](#), and the [Speech Pathology and Audiology Commons](#)

---

## Citation Information

Brackenbury, Tim; Fey, Marc; Lof, Gregory; Munson, Benjamin; and Williams, A. Lynn. 2008. Practice in Child Phonological Disorders: Tackling some Common Clinical Problems. Seminar Presentation. *American Speech-Language-Hearing Association Convention*, Chicago, IL. [https://www.asha.org/Events/convention/handouts/2008/2387\\_Brackenbury/](https://www.asha.org/Events/convention/handouts/2008/2387_Brackenbury/)

This Presentation is brought to you for free and open access by the Faculty Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in ETSU Faculty Works by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact [digilib@etsu.edu](mailto:digilib@etsu.edu).

---

# Practice in Child Phonological Disorders: Tackling some Common Clinical Problems

## **Copyright Statement**

This document is the intellectual property of the author(s). It was originally published by the *American Speech-Language-Hearing Association Convention*.

## 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

## Major Themes

- 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

## Major Themes

- 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 the themes
  - Time
  - Knowledge
  - Effectiveness and efficiency

## Practice in Child Phonological Disorders: Assessment Issues

A. Lynn Williams  
Center of Excellence in Early Childhood Learning and Development  
East Tennessee State University  
[williamL@etsu.edu](mailto:williamL@etsu.edu)

## 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

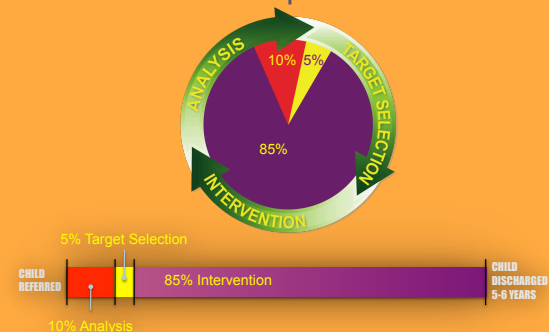
## Phonological Analysis

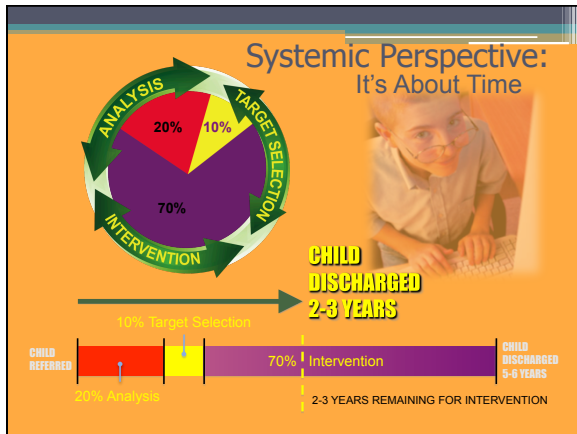
- Can be completed on test data, probes, conversational samples
- Different analysis frameworks
  - Relational "error" analyses
    - SODA
    - Phonological process analysis
    - P-V-M analysis
  - Independent analyses
    - PPK (phonological knowledge relative to adult)
    - SPACS (phoneme collapses 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)

## Traditional Perspective: Linear





### 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)

Sound	Word		
	Initial	Medial	Final
1. p	m	k	
2. m			
3. n			
4. w			
5. h			
6. b			
7. d			
8. k			
9. t			
10. d			
11. s			
12. l			
13. t	k	k	g
14. g			
15. g			
16. s			
17. w			
18. s			
19. g			
20. v			
21. v			
22. t			
23. d			
24. g			
25. h			
26. m			
27. n			
28. n			
29. g			
30. g			
31. s			
32. s			
33. k			
34. g			
35. d			
36. w			
37. s			
38. w			
39. g			

### 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?

### Adam's PVM Analysis

Place - Voice - Manner  
Error Pattern Analysis

Name: Adam  
Date: \_\_\_\_\_  
Transcriber: Katharine B.

nasal clusters	/r clusters	/w clusters	/l clusters	Phonetic Inventory	PVM Error Patterns
p /d w /f g /g n /k m /g w /s	b /p g /r g /r g /r	g /kw w /sw	m /sp		
re-hd-nlg-mp	pe-bk-gi-fi-si	en-er-tr-dr lg-gr-fr-jr-dr	kw	kw-ks-tp-st-ks	

### 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/

## SPACS

Child: Adam Word-Initial: Phoneme Collapse Date: 4-09-07

CHILD	ADULT	CHILD	ADULT
	p		p
	b		b
	t		t
	d		d
	k		k
	g		g
	stops		stops
	f		f
	v		v
	s		s
	z		z
	fricatives		fricatives
	h		h
	ch		ch
	sh		sh
	fricatives		fricatives
	ts		ts
	dz		dz
	affricates		affricates
	m		m
	n		n
	nasals		nasals
	w		w
	j		j
	glides		glides
	l		l
	r		r
	liquids		liquids
	ts		ts
	st		st
	clusters		clusters

A 12-year-old student

## What information does SPACS provide?

- Although we see the sound preference for /g/, we can see how extensive this error substitute is
  - 1:17 phoneme collapse
- 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
  - 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

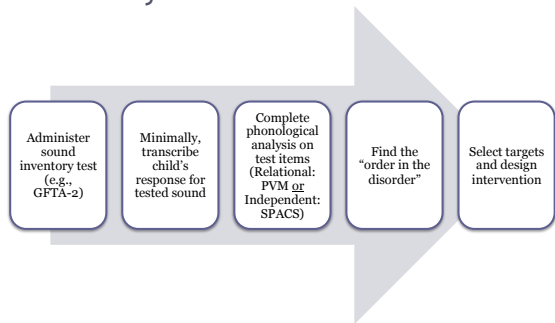
## Time for Assessment

- 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



## 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, & Stratman; Khan, 2002)
- whole-language perspective (Hoffman & Norris)
- "phonomotor" perspective (Bleile)
- integrated perspective (Miccio)



# Phonological Analysis Summary and Management Plan

(after Baker, 2004)

Client: \_\_\_\_\_

Date: \_\_\_\_\_

## 1. SUMMARY OF PHONOLOGICAL ANALYSIS

Position	Phoneme Collapses (3 predominant across positions)	Phonological Processes (3 predominant across positions)
WORD-INITIAL		
WORD-FINAL		
WORD-MEDIAL		

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: \_\_\_\_\_



#### 4. INTERVENTION APPROACH

Intervention Group	Approach
<b>Contrastive Approaches</b>	<input type="checkbox"/> Minimal Pairs <input type="checkbox"/> Multiple Oppositions <input type="checkbox"/> Maximal Oppositions <input type="checkbox"/> Empty Set
<b>Approaches for Young Children (2-4 years)</b>	<input type="checkbox"/> Stimulability Approach <input type="checkbox"/> Cycles <input type="checkbox"/> PACT
<b>Phonological Awareness / Literacy</b>	<input type="checkbox"/> Metaphonological Approach <input type="checkbox"/> Psycholinguistic Approach
<b>Integrated Intervention Approaches</b>	<input type="checkbox"/> Morphophonemic Phonological Approach <input type="checkbox"/> NSIT <input type="checkbox"/> Neuro-Networking <input type="checkbox"/> Non-Linear Phonological Approach
<b>Phonetic Intervention Approaches</b>	<input type="checkbox"/> Core Vocabulary <input type="checkbox"/> DTTC <input type="checkbox"/> PROMPT <input type="checkbox"/> Nuffield Dyspraxia Approach <input type="checkbox"/> Traditional Articulation Approach
<b>Other</b>	

#### 5. EVALUATION PLAN

Measurement	Frequency	Criterion
<input type="checkbox"/> single-word probe  <input type="checkbox"/> conversational sample		

Speech-Language Pathologist: \_\_\_\_\_ Date: \_\_\_\_\_

## An 'Advanced' Issue in Assessment: Speech Perception

Benjamin Munson  
Department of Speech-Language-Hearing Sciences  
University of Minnesota, Minneapolis



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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"
  - "Any new assessment techniques"
  - "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"



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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?



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

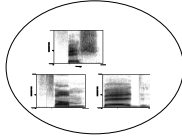
## Speech Perception: Knowledge

- 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



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Speech Perception: Knowledge

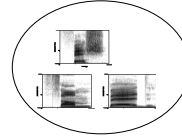


- The targets for speech production are auditory representations in long-term memory.
- We say what we want to hear**
- We learn how to speak, in part, by learning how we should sound**



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Speech Perception: Knowledge



- 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**

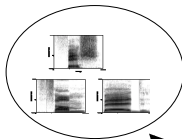
"To make the low second-formant frequency in the vowel vowel /u/, I can either round my lips or move the root of my tongue back"

"To make the low third-formant frequency for /r/, I can either curl my tongue back or bunch my tongue root"



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Speech Perception: Knowledge



"did I do that correctly?"

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

"To make the low second-formant frequency in the vowel 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"



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Speech Perception: Knowledge

- 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



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Speech Perception: Knowledge

- 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)



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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 paidologov database)



## Speech Perception: Time

- It should 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>
- 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

Pictures:  
Google Images






- 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



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## An example of a specific "[w] for / r/" perception problem

	Is it a whip?	Is it a rip?	Is it a dip?
	Always "yes" (or an inconsistent response?)	Always "yes" (or an inconsistent response?)	No
	Always "no" (or an inconsistent response?)	Always "no" (or an inconsistent response?)	No
	No	No	Yes



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This pattern would suggest that the child's production problems co-occur with a tendency to hear /r/ as [w]

## 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 doesn't correct for 'false alarms'.
- ...but it doesn't cost \$450.00



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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 along
- This is true regardless of the therapy type that the perception training is paired with.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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/.



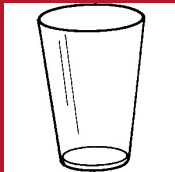
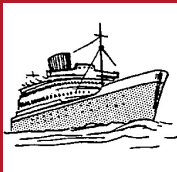
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

/s/ - /ʃ/

Forced choice with feedback



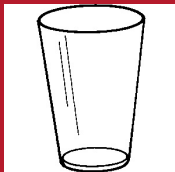
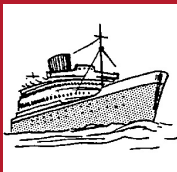
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

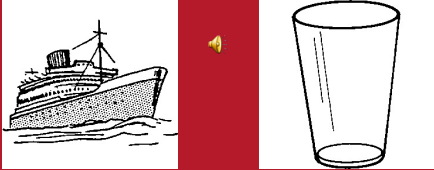


Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008



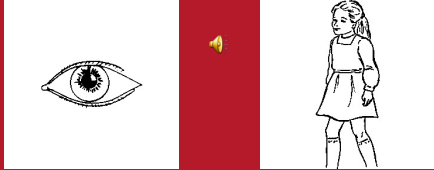
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008





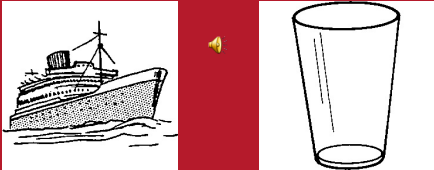
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of a ship, and the right box contains a black and white line drawing of a glass. A small yellow arrow points from the ship to the glass. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.



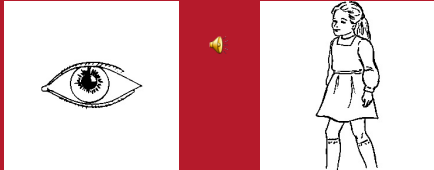
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of an eye, and the right box contains a black and white line drawing of a girl. A small yellow arrow points from the eye to the girl. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.



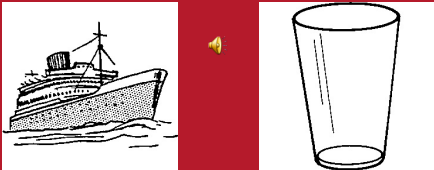
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of a ship, and the right box contains a black and white line drawing of a glass. A small yellow arrow points from the ship to the glass. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.



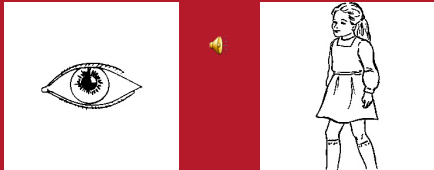
Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of an eye, and the right box contains a black and white line drawing of a girl. A small yellow arrow points from the eye to the girl. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of a ship, and the right box contains a black and white line drawing of a glass. A small yellow arrow points from the ship to the glass. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

This panel features a red background with two white square boxes. The left box contains a black and white line drawing of an eye, and the right box contains a black and white line drawing of a girl. A small yellow arrow points from the eye to the girl. In the bottom-left corner, there is a small cartoon character icon. The text 'Benjamin Munson, ASHA Phonology' and 'Panel, 11/22/2008' is centered at the bottom.

## 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.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## 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.



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Questions

- Ask away!
- I'm at [Munso005@umn.edu](mailto:Munso005@umn.edu)
- Disclaimer: I have no financial interest in SAILS, though I am actively collaborating with Susan Rvachew



Benjamin Munson, ASHA Phonology  
Panel, 11/22/2008

## Some Treatment Approaches

Gregory L. Lof, Ph.D., CCC-SLP  
Program Director/Associate Professor  
MGH Institute of Health Professions  
Boston, MA  
[glof@mghihp.edu](mailto:glof@mghihp.edu)

## Therapy Approaches

### Therapy Approaches

Traditional Therapy  
Minimal Pairs  
Maximal Pairs  
Multiple Opposition  
Metaphon  
Metaphonological

(Van Riper)  
Traditional Approach

### Traditional Articulation Approach

This is the 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

## 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 the replacement
- ✓ Child should be stimulable for correct target sound

## Minimal Pairs

*bow*      *boat*



## 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

# Maximal Pairs

## Maximal Pairs

Also known as...

Maximal Opposition  
Therapy

## Maximal Pairs

- ✔ 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

## Maximal Pairs

*Multiple feature contrasts*

m	ʃ
Nasal	Oral
Voiced	Voiceless
Non-Strident	Strident
Anterior	Posterior

## Maximal Pairs

- ✔ Suppose a child produces t/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,

## Maximal Pairs

- ✔ 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 stimulative for missing sounds

# Multiple Oppositions Approach

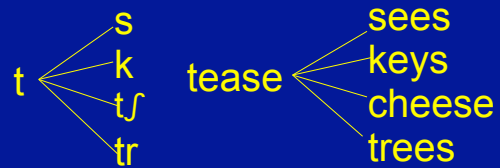
## Multiple Oppositions

- ✓ 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/

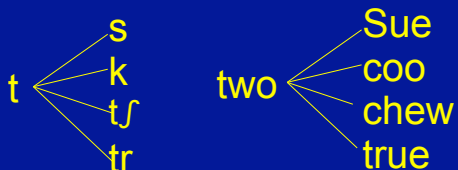
## Multiple Oppositions



## Multiple Oppositions



## Multiple Oppositions



## Multiple Oppositions

- ✓ Best for children who have many homonyms

# Metaphon Approach

## 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)

## Metaphon Approach

### Two Phases of Therapy

#### Phase 1

Developing phonological awareness

#### Phase 2

Developing communicative awareness

## Metaphon Approach

### 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

## Metaphon Approach

### 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

## 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

- ✓ **Phoneme blending**  
(adult says: b—a—l, child says “ball”)
- ✓ **Phoneme segmentation**  
(adult says: “ball”, child says “b—a—l”)
- ✓ **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

- ✓ **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

## 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.

## Nonspeech Oral Motor Exercises

### Reasons Why They Don't Work:

- ❑ Part-whole training and transfer
- ❑ Strengthening the structures
- ❑ Relevancy to the act of speaking
- ❑ Task specificity
- ❑ Warm-up/Awareness/Metamouth

## Nonspeech Oral Motor Exercises

### 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.

## Nonspeech Oral Motor Exercises

### Reasons Why They Don't Work:

- ❑ Strengthening the structures
- Very little strength is needed for talking;  
Probably aren't increasing strength with the exercises;  
Strength measurement is subjective and unreliable.

## Nonspeech Oral Motor Exercises

### Reasons Why They Don't Work:

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

## Nonspeech Oral Motor Exercises

### Reasons Why They Don't Work:

- ❑ 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.

## Nonspeech Oral Motor Exercises

**If you want speech to change, you must work on speech!**

## Goal Attack Strategies

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



## Goal Attack Strategies

### VERTICAL STRATEGY

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



## Goal Attack Strategies

### HORIZONTAL STRATEGY



More than one goal is  
treated simultaneously

## Goal Attack Strategies

### HORIZONTAL STRATEGY



Or more than one sound within a  
pattern is worked on at a time

## Goal Attack Strategies

### HORIZONTAL STRATEGY

Production of Final Fricatives

/s/ /f/ /z/ /v/ /ʃ/

## Goal Attack Strategies

### CYCLICAL STRATEGY



## Goal Attack Strategies

### CYCLICAL STRATEGY



For example  
Hodson's  
Cycles  
Approach

## Goal Attack Strategies

### 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

## Goal Attack Strategies

### 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

## Goal Attack Strategies

### Cycles Approach

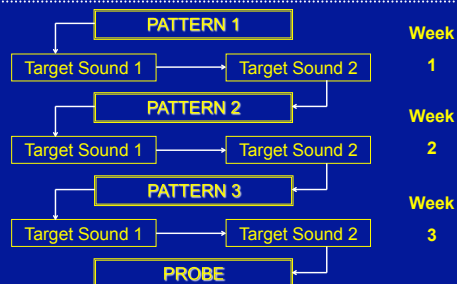
The first cycle lays a foundation and allows children to have early success

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

## Modified Cycles Approach



## 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

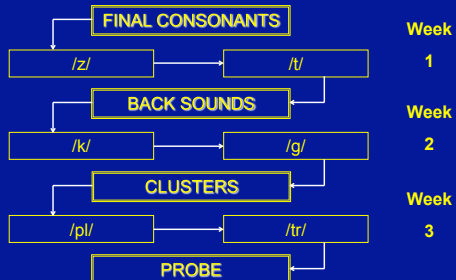
### Pattern 3

*Produce clusters*

Sound 1: /pl/

Sound 2: /kr/

## Modified Cycles Approach



## Modified Cycles Approach

### PROBE

- At end of 3 weeks, probe to determine emergence.
- If sounds  $\leq$  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.  
Department of Hearing and Speech  
School of Allied Health  
University of Kansas Medical Center  
Kansas City, KS, USA  
e-mail: [mfey@kumc.edu](mailto: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

## Intervocalic Targets

- number → ['nʌhi]
- lucky → ['lʌhi]
- pencil → ['pɪho]
- balloon → [bə'lu:n]
- forget → [fə'gɪ]
- **Betina** → [bə'tihə]
- **another** → [ə'nʌhə]
- people → ['piho] ~  
[pi'po]
- baby → ['behi] ~  
[be'bi]

## Final Targets

- group → [gwʊm]
- like → [laɪŋ]
- mad → [mæd<sup>n</sup>]
- knife → [naɪn]
- here → [hɪəŋ]
- light → [laɪt<sup>ŋ</sup>]
- lid → [lɪd] ~  
[lɪd<sup>n</sup>]
- ball → [bɔŋ] ~  
[bɔg<sup>ŋ</sup>]



# F & S's Phonological Intervention Plan



# Nora's New Intervention Plan: Clinician



# Nora's Intervention Plan: Parent



# Nora's Intervention Plan: Teacher



## 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