Interventions for Speech Sound Disorders in 2010

American Speech-Language-Hearing Association Convention
Short Course (SC20)
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Declaration of conflict of interest

The speakers in this short course are authors in


Organization of the short course

1. Overview of 18 evidence-based intervention approaches for SSD in children
   - Each author will present
     - brief overview
     - short video clip

2. Round table discussions
   - Participants can select two different round table discussions with authors that will be guided by structured questions

3. Concluding statements
Learning objectives

By the end of the short course, participants will be able to:

1. Identify unique features of 18 intervention approaches for speech sound disorders in children
2. Identify potential barriers to the implementation of various intervention approaches
3. Discuss interventions that are appropriate for specific sub-populations of children with speech sound disorders

Speech sound disorders (SSD) in children

- Speech sound disorders
  - widespread in preschool and school-aged children
  - encompass a variety of etiologies
  - often involves concomitant disabilities
  - for the majority of children there is currently no known cause

- This diversity presents a considerable challenge for understanding SSD and how best to design intervention that also meets the standards of evidence-based practice
Differential diagnosis and intervention

- SSD often associated with difficulties that are neither confined to speech nor to early childhood
  - High correlation with written language
  - General academic difficulty through high school
  - Socialization difficulties
- Important to make differential diagnoses of SSD and align the client needs with the most appropriate intervention

Clinicians are incredibly busy people

- “pick-and-choose” approach
  - Use some aspects of a studied intervention, but not others (Lancaster, Kench, Levin, Pring, & Martin, 2009)
- OR a ‘gold standard’ treatment approach that works for all children with SSD (Kamhi, 2006, p. 272)
  - A range of intervention approaches shown to be effective in modifying children’s sound systems ...

SO ...

HOW DO YOU CHOOSE THE BEST APPROACH?
Aim of this short course

- Present an overview of a wide spectrum of intervention approaches used for SSD in children
- Provide SLPs with a sufficient overview to choose intervention approach that best aligns with client’s SSD
- NOTE: A single intervention approach will likely not be the sole intervention
  - Several interventions designed as transitional methods to help children progress from emerging to elaborating their sound systems.

- 18 authors from around the world invited to present an overview about interventions they have developed and/or tested.
  - many of the world’s foremost SLP researcher-clinicians from the United States, Canada, Scotland, Ireland, England, and Australia.
- The interventions were selected based on their empirical evidence, or potential efficacy, as well as their widespread use across ages, severity levels, and populations.
Approaches encompass interventions that focus on

- sound production accuracy
- system-wide restructuring of the child’s phonology
- motor speech
- perceptual training
- computer-based interventions

19 intervention approaches

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Part I: Direct Speech Production Interventions

1. Minimal pairs
Unique features of the Minimal Pairs approach

- One of the oldest and most widely used contrastive intervention approaches
- Characterized by the pairing real words produced as homonyms by a child (e.g., key~tea; snail~nail)
- Application of Greenfield and Smith’s (1976) pragmatic principle of informativeness
- Two versions of the approach:
  - Meaningful minimal pair intervention
  - Perception-production minimal pair intervention

Video Clip: Minimal Pairs
2. Multiple Opposotions

A. LYNN WILLIAMS

Unique features of the Multiple Opposotions approach

- **Contrastive approach for children with limited sound inventories who use one sound for several target sounds**
  - e.g., [tip] produced for “tip, sip, chip, Kip, trip”

- **Based on a systemic perspective**
  - Child:adult system mapped in terms of phoneme collapses
    - compensatory strategies developed to account for limited sound system
  - Provides an ecologically valid description, which also has explanatory power

- **Treatment of the whole is greater than the sum of its parts**
  - Train across a rule set
  - Enlarge relevant frame of learning that is required
Video Clip: Multiple Oppositions

Multiple Oppositions for /k/~/f, l, tʃ, st/ #_

3. Complexity Approaches

ELISE BAKER
Unique features of the Complexity approaches

- Primary focus is on what is targeted in intervention, rather than how targets are taught (Gierut, 2005)
- Two main types:
  - Non-homoyous contrast approaches (e.g., maximal oppositions, and treatment of the empty set)
  - Non-contrastive approaches (e.g., targeting consonant clusters with small sonority difference scores)
- Based on the premise that complex targets facilitate efficient widespread change in children’s phonological systems
- Unique feature - use of novel word stimuli
  - e.g., chim and lim

Video Clip: Maximal Oppositions and Empty Set
4. Cycles

**BARBARA HODSON**

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**Unique features of the Cycles approach**

1. Identify Broad Phonological DEVIATION Patterns
2. Target Each Deficient PRIMARY Phonological PATTERN (e.g., /s/ clusters) 2-4 Hours (average) per CYCLE*
3. Incorporate AMPLIFICATION & METAPHONOLOGICAL Tasks During EACH Session
4. Reassess between Cycles & RECYCLE Primary PATTERNS as needed until Emerge in Conversation
5. Increase COMPLEXITY Gradually
6. Target SECONDARY PATTERNS after Specified Criteria are met (Hodson, 2007)**

- FOCUSED AUDITORY INPUT/Stimulation for Toddlers
- “MULTISYLLABICITY” & Complex Consonant Sequences for older students who have intelligibility issues

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Cycle is a period of time (Varies from 5 to 15 hours. Depends on number of PATTERNS that need to be targeted. Sessions are 60 minutes per week; Children typically require 3-4 Cycles.)

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## 5. Nuffield Centre Dyspraxia Programme

**Pam Williams**

### Unique features of the Nuffield Centre Dyspraxia Programme

- Created in UK for children with SSD/CAS, 3-7 years
- A motor and linguistic approach
- Build accurate motor programs for phonemes, words and sentences, supported by picture cues
- Establish through repetitive practice
- Develop a contrastive system at each phonotactic level (e.g., C, V, CV, CVCV, CVC)
- Work on several targets simultaneously across speech system
- Photocopiable pictures/worksheets
6. Stimulability Intervention

ADELE W. MICCIO & A. LYNN WILLIAMS
Unique features of Stimulability intervention

- For young children with limited phonetic inventories who are not stimulable for many or all absent sounds
- Major components
  - Target stimulable and non-stimulable sounds
  - Speech sounds are associated with alliterative characters
  - Speech sounds are associated with hand/body movements
  - Vocal practice encouraged through play-based turn-taking activities
  - Early success and successful communicative attempts ensured with practice on both stimulable and non-stimulable sounds

Video Clip: Stimulability
Part II: Interventions within a broader context

7. Metaphonological Approach

ANNE HESKETH
Unique features of the Metaphonological approach

- Aims to increase children’s awareness of word forms and how their own differ from the adult target, to facilitate speech change and literacy acquisition.

  - **MAKES CHILDREN THINK** about the structure of words in ways directly related to their speech patterns

  - Encourages children to be agents in their own learning; helps them understand the need for change and how to achieve it

  - Facilitates and capitalises on literacy development

Note: It is integrated with speech production practice and can be adapted to any phonological goal.

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Video Clip: Metaphonological
8. Computer-Based Interventions

YVONNE WREN

Unique features of computer-based interventions

- Computer = ‘tool’ not a ‘type of intervention’
- Assists in *delivery* of intervention
- Consistent and controlled presentation of stimuli
- Reliable recording of performance
- Supports attention
- Can deliver a range of types of interventions
- Can be customised to child’s specific needs
- Child can work independently
Video Clip: PFSS

Video Clip: SCIP
9. Speech perception

SUSAN RVACHEW

Unique features of speech perception approaches

- Clarification: Phonemic perception intervention is a procedure, not an approach.
- Compatible (and tested with) linguistic and motoric approaches to the promotion of speech intelligibility.
- SAILS presents the child with highly variable natural stimuli that include actual rather than simulated misarticulations of target words produced by multiple talkers.
- SAILS has been validated in 1 single subject randomization study involving 4 subjects, 1 equivalent groups comparison, and 4 RCTs.
Video Clip: Speech Perception

10. Nonlinear phonological intervention

B. MAY BERNHARDT
Unique features of Nonlinear phonological intervention

Q: How much fun is there in nonlinear /fənələdʒi/?

A: The [fən] starts at the feature and ends at the prosodic phrase.

Focus on multiple levels will enhance Tx outcomes....

Hola from Canada and the GSFs.....

Video Clip: Nonlinear Phonology
11. Whole Language/Dynamic Systems

PAUL HOFFMAN & JAN NORRIS

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**Dynamic Systems Model Intervention Principles**

- Focus on features, phonemes, syllable structures to improve clarity of individual oral utterances and develop phonemic awareness and literacy skills.

- Use cloze procedures, extensions, and modeling to develop simple and complex syntax and provide practice in speech sound production in more complex utterances.

- Provide models, expansions, extensions, and explanations of language units, combining auditory and visual inputs linking print with oral language.

- Structure the interaction as joint development of a complex topic like a narrative.
12. Morphosyntax Approach

Ann Tyler
### Unique features of the Morphosyntax approach

- Children with co-occurring SSD + expressive language impairment
- Indirect focus on speech through targeting tense and agreement markers, therefore final clusters (e.g., past tense, *kicked* → /kt/; 3SR, *likes* → /ks/, *gives* → /vz/)
- Multiple targets scheduled in a cycle
  - alternating weeks of speech sound intervention and morphosyntax intervention = speech or language target every other week
  - 4-week cycle of one morpheme each week
- Outcomes capitalize on interactive aspects of morphology and phonology → gains in both speech and language
- Adapted stories and scripts for activities in which to provide focused stimulation and elicited production opportunities (*Months of Morphemes*)
  - in group and individual sessions

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### Video Clip: Morphosyntax
13. Naturalistic Speech Intelligibility

STEPHEN CAMARATA

Unique features of the Naturalistic Speech Intelligibility approach

1. Focuses on word intelligibility as function outcome
2. Intervention targets word production rather than individual phonemes or non-speech oral motor exercises
3. Emphasis on increasing word level intelligibility
4. Does NOT target articulation drill and practice
5. Follows principles of natural speech and language acquisition: Transactional Speech and Language Interaction
6. Does NOT emphasize prompting
7. Is especially well suited to preschoolers and patients with low intelligibility (e.g., dysarthria or apraxia)
Video Clip: Naturalistic Speech Intelligibility

14. Enhanced Milieu Training-
Phonological Emphasis

NANCY SCHERER
Unique features of the Enhanced Milieu Teaching-Phonological Emphasis approach

- Supports phonological change simultaneously with language for children under 3 years of age
- Components
  - Target words chosen based on phonologic and vocabulary criteria
  - Phonetic awareness to promote consonant production & oral airflow
  - Responsive interaction and environmental arrangement to promote engagement in play and communicative activities
  - Prompting strategies provide opportunities to model, expand, request responses, and recast speech sound targets

Video Clip: Enhanced Milieu Training: Phonological Emphasis

Mand Model
Unique features of the PROMPT approach

- Uses Global Domain Analysis, Speech Analysis Observation and Motor Speech Hierarchy to create, assess and devise a Communication Focus for treatment goals & objectives.
- Works across all domains (physical-sensory, cognitive-linguistic, social-emotional) and embeds motor speech actions at the appropriate level to establish functional communication.
- Uses very specific types of tactual input devised to support and activate different levels of the motor system; varies according to child profile.
- Always uses a motor-phoneme warm-up (mass practice), and implements distributed, variable practice in functional, game-like activities. Always gives clear feedback and directions e.g. “yes”, “no”, “correct”, “incorrect”.
- Co-articulation is always worked on. Beginning at the basic syllable level e.g. “be”, “bo”, “ba”, the changes (acoustically) that result from different motor movements and timing are considered.
- Always includes turn-taking, choice making in age appropriate activities, routines, games.
- Parents are an essential part of the team and work with clinician to develop appropriate home program.
- Can be used with clients with cognitive impairments.
- PROMPT is a motor skill; requiring extensive clinician training and practice.
Part III: Interventions for Achieving Speech Movements
16. Visual feedback

ALICE LEE & FIONA E. GIBBON

- Uses an artificial EPG plate moulded to fit against hard palate.
- Embedded with 62 electrodes, for detecting characteristic tongue-palate contact patterns for lingual sounds.
- Identifies abnormal patterns of articulation in assessment.
- Can be used as a visual feedback device for treatment.

Video Clip: EPG
17. Nonspeech Oral Motor Therapy

HEATHER CLARK

Unique features of Non-speech Oral Motor Therapy

- **Goals**
  - To normalize underlying motor functions supporting speech production
  - To provide kinesthetic and proprioceptive input that may facilitate speech movements

- **Targets**
  - Strength, tone, control, somatosensation

- **Key Issues**
  - Identifying underlying impairments
  - Utilizing techniques based on sound neurophysiologic principles
  - Incorporating integrated speech movements
18. Vowel Intervention using Ultrasound

MAY BERNHARDT AND PENEOPE BACSFALVI
Unique features of vowel intervention using ultrasound

- Bernhardt’s nonlinear phonology studies of 1990s; Treated Cs and word structure: Vowels improved for free.....
- *If, however, vowels need attention.....*
  - Analyse vowel features singly and in combinations
  - Use pictures, especially moving ones (artic feedback)

Video Clip: Vowel Intervention Using Ultrasound
ROUND TABLE DISCUSSIONS

Round table discussion questions

1. What single “new” or “critical” element most differentiates your intervention from others?

2. What is the biggest barrier(s) to an established clinician adopting your intervention?

3. Are there aspects of your intervention that could be adopted by a clinician without serious misuse? What would that/those be?

4. If a beginning SLP working with SSD can only learn to implement the procedures associated with 3 interventions,

   a) What 3 interventions would you recommend?
   b) If your own was not included, why not?
Concluding comments

REBECCA MCCAULEY
A. LYNN WILLIAMS
SHARYNNE MCLEOD

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Unique features of 19 intervention approaches for SSD in children

- Handout (Table 1.5 from Williams, McLeod, & McCauley, 2010)

- Summarized according to 3 parameters
  - Developmental Level
  - Targeted Stage of Production
  - Targeted Outcomes

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<td>Literacy</td>
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Potential barriers to the implementation of the approaches

- Special training (e.g., PROMPT)
- Use of technology (e.g., EPG, Ultrasound, Computer-based Interventions, Speech Perception Intervention)
- Accessibility of parents/families
- Intensity

Interventions that are appropriate for specific sub-populations of children

- Very young children (2-4 years)
  - Stimulability Approach, EMT-Phonological Emphasis, Cycles
- CAS
  - Core Vocabulary, Nuffield Centre Dyspraxia Programme, PROMPT, Cycles
- Children at risk for literacy difficulties
  - Metaphonological Approach, Psycholinguistic Approach, Cycles
- Children with limited phonetic inventories
  - Multiple Oppositions, Complexity Approaches, Cycles
Concluding comments

- Co-morbid language impairment
  - Morphosyntax Approach, Dynamic Systems

- Motor-based SSD
  - EPG, Ultrasound, OMT, Developmental Dysarthria

- Cleft lip/palate
  - EMT-Phonological Emphasis

- Perception difficulties
  - Speech Perception Intervention