Literacy Activities to Increase Intelligibility in Children with Moderate to Severe Speech Sound Disorders

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Phonetic vs. Phonological Perspective
Perspectives on how speech is learned

Phonetic Perspective

Considers individual sounds without any relationship to one another

Considers the learning of Articulation as a process of learning to produce each sound

Is associated with teaching Articulation as a process of teaching the child to produce each sound in isolation, then syllables, then words, then sentences and in the initial, medial and final positions.
Phonetic Perspective

• Motor based
• Behavioral influence
• Focus on phonemes
• Traditional therapy
• Mild to moderate impairment
Perspectives on how speech is learned

Phonological Perspective

Considers the sound system and the relationships among sounds

Considers learning the Sound System as a process of learning the rules of the phonological systems of the language

Is associated with identifying patterns of errors rather than individual sounds and eliminating those error patterns
Phonological Perspective

• Focus on system
• Facilitation of patterns and increase of overall intelligibility
• Focus on assessment
• Focus on target selection
• Severe to profound impairment
Implications of the Phonological Perspective for Clinical Practice

• **Assessment** is very different for the two perspectives. It has a much greater place in the phonological perspective and focuses on identification of error patterns rather than individual sound errors.

• **Target Selection** is a critical issue in the phonological perspective.

• **Intervention** activities may not vary as much. After assessment and target selection has occurred, the actual therapy activities may be similar.
Phonological Theories
American Structuralism

- Commonalities among segments were identified: voicing, manner, place of production
- Development is the correct production of individual speech sounds
- Led to treatment of articulation disorders using a behavioral approach
Generative Phonology
Chomsky

• Sounds and sound changes defined by distinctive features

• Development is *learning the rules* of the native language based on a genetic endowment

• *Led to assessment and treatment of phonological disorders based on distinctive features, describing rules and underlying phonological knowledge*
Natural Phonology
Stampe

• Includes concept of phonological processes, which are simplification rules

• Development is based on eliminating simplification production rules to reach perceptually based adult representations

• *Led to assessment and treatment based on elimination of phonological processes*
Nonlinear Phonology

• Autosegmental Phonology
  – If a segment is not linked to a position on another tier it will not be phonetically realized even though it may be available in an underlying representation
  – *This theory can capture contextually based limitations in development and disorders.*

• Metrical Phonology
  – Deals with the relative prominence of syllables, feet, words, and larger units in the hierarchical representation.

• Lexical Phonology
  – Relevant features include underspecification of features, phrasal phonology, inflectional morphology

• Feature Geometries
  – Specifies relationship of features to each other rather than considering them a random bundle
    • For a more complete discussion see *The New Phonologies*
Nonlinear and Optimality

• Nonlinear part:
  – There is more to learning and using the phonological system than learning phoneme segment and bundles of features

• Optimality part:
  – There is a conflict between faithfulness (matching the adult model) and constraints (what you cannot do). What results is an attempt at a repair that is mediated by the whole system, which includes more than linear segments.
Optimality Theory

• Maintains relationship between input and output or between underlying mental representation and surface representation or realization

• Input and output are mediated by two processes:
  – GENerator – generates all possibilities
  – EVALuator – evaluates possibilities and chooses phonetic form that is optimal for grammar
Markedness Constraints

- *Coda
- *Fricatives
- *Liquids
- *Liquid - [l]
- *Liquid - [r]
- *velar

- No final consonants
- No fricatives
- No liquids
- No liquid [l]
- No liquid [r]
- No velars
Faithfulness Constraints

- MAX
- DEP
- Ident-Feature
- Ident-[cons]
- Ident-[cont]

- No deletion
- No insertion
- Don’t change features
- Don’t change [consonantal]
- Don’t change [continuant]
Assessment and Intervention

- Everyone has an EVAL that contains all of the constraints we need. Initially, the constraints are in a default ranking. As phonological knowledge grows children learn the correct constraint ranking for the native language. Children with phonological disorders maintain the default ranking or have a mixed up ranking. The SLP’s goal is to facilitate re-ranking of constraints.
What does this mean for target selection?

- **Minimal Oppositions**
  - **Theory:** Awareness of phonological contrasts
  - **Teaching Method:** Provide meaningful activities to demonstrate the communicative importance distinction
  - **Activity:** Play production tasks focused on creating phonological Distinctions

  - **Theory:** Focus on Least Phonological Knowledge
  - **Teaching Method:** Maximal Oppositions
  - **Activity:** Practice with Minimal Pairs

  - **Theory:** Focus on all sounds that are collapsed to one phoneme in the child’s system to reorganize the phonological system
  - **Teaching Method:** Simultaneously contrast several target sounds with the comparison sound
  - **Activity:** Practice with multiple opposition pairs
Phonology & Language Treatment in the Classroom
Relationship between Language and Phonology

• It has been found that:
  – Children with phonological disorders are more likely to have language disorders.
  – Children with language disorders are more likely to have phonological disorders.
  – There is an obvious synergistic relationship between the two – phonology is an aspect of language!
  – Current theories of language and phonological acquisition support this relationship.
Assumptions about Intervention

• Does work on phonology help language skills?
• Does work on language skills help phonology?
• Where is it best to target phonology?
  – In individual phonological therapy?
  – Concurrently with language therapy?
  – In naturalistic environments – e.g. the classroom?
Treatment Strategies

- Phonology treatment only
- Language treatment only
- Sequential phonology and language treatment
- Simultaneous language and phonology treatment - non integrated
- Integrated phonology and language treatment
Implications for Treatment

• The possibilities to consider are:
  – There is generalization across phonology and other language domains
  – There is no generalization across domains
  – There is generalization only in one direction, i.e. from phonology to other language domain only or from other language domains to phonology only.
Implications for Treatment: Research findings

• Generalization from language-based intervention to phonologic domain (Hoffman et al., 1990; Hoffman et al., 1996; Tyler et al., 2002)

• Little generalization from language to phonology (Tyler & Waterson, 1991; Tyler & Sandoval, 1994; Fey et al. 1994)

• Generalization from phonologic treatment to language domain (Fey et al., 1994)

• Evidence to date is not conclusive.
Possible Explanations for Discrepancies among Studies

• Differences in:
  – Severity of impairments across studies
  – Research methodology
  – Duration of treatment programs
  – Treatment methods
General Treatment Approaches

• Contrast training
  – Minimal pair opposition
  – Maximal pair opposition
• Selected word practice
• “Seizing the moment”
  – Using books
  – Using the curriculum
  – Intervening during play
Remediation Suggestions

• If the therapy goal is to use Final Consonants, then incorporate specific grammatical morphemes in contrasting word pairs.

• Grammatical Morpheme  Examples
  Plurality  key-keys, sock-socks
             shoe-shoes
  Possessive  Jo-Jo’s, Mae-Mae’s
  Regular Past Tense  row-rowed, show-showed
Remediation Suggestions (cont).

• If the therapy goal is to use Consonant Clusters, then incorporate specific grammatical morphemes in contrasting word pairs.

• Grammatical Morpheme Examples
  - Plurality: boat-boats, hat-hats
  - Possessive: mom-mom’s, dad-dad’s
  - Regular Past Tense: walk-walked, kiss-kissed
Remediation Ideas (cont.)

• If the therapy goal is to use other grammatical morphemes, use contrasting word pairs in sentences that are more conversation-based.

• Grammatical Morpheme Examples

  
<table>
<thead>
<tr>
<th>Copula</th>
<th>Auxiliary</th>
</tr>
</thead>
<tbody>
<tr>
<td>He is sad/He is mad</td>
<td>He is shopping/He is hopping</td>
</tr>
<tr>
<td>She is tall/She is small</td>
<td></td>
</tr>
</tbody>
</table>


Considering ALL the issues:

- Patterns/process selection
- Sound/word target selection
- Stimulability
- Facilitating contexts
- Intelligibility
- Frequency of occurrence of the sound
- Developmental appropriateness
- Phonological knowledge
What do we as SLPs already know?

- Children learn language by learning at least four sets of rules: pragmatic, semantic, syntactic, phonologic/graphic.
- The language learning process is self-regulated by each child. The child must be cognitively ready for the language function, meaning and structure.
- Children learn language in appropriate contexts which are experientially based and meaningful for them.
- Children learn language when they have a reason to communicate.
So, What do SLPs do?

- Make the content for language teaching meaningful and relevant to the child and sequentially based on normal development.
- Pace must be at the child's own speed.
- Sequence skills to follow normal development.
- Carefully observe each child to allow the child to help us choose meaningful goals.
- Use natural reinforcement as the best motivator for successful communication. (you get what you ask for!)
And, then we...

- base interventions and activities on the child's level of cognitive development;
- draw from the child's natural environment;
- involve the children in interpersonal interaction;
- encourage active participation on the part of the child;
- make fools of ourselves in adult eyes – but have a BALL with children being larger than life.
**Remediation Based on Normal Development**

- The acquisition of phonemes and phonological rules is not an all-or-none process. Accuracy comes gradually and not for one sound at a time.
- All exemplars of a phoneme do not have to be practiced for acquisition to occur.
- Treatment of multiple error patterns in preschool children presents different issues than treatment of older children who have errors on only /r/ or /s/.
- There are advantages to working with children in groups.
- Like other language rules, phonological rules are learned through the process of communication in natural and meaningful contexts.
Implications for Serving Preschool Children

• The preschool classroom provides a natural and meaningful context where communication is required.
• Every child does not have to work on only one sound that is chosen as his target.
• Modeling and practice of a variety of sounds can occur and is in keeping with normal acquisition.
• Naturally occurring words can be used for practice words.
• Modeling, exposure and the opportunity for practice can be provided.
• Children can learn from each other and can be encouraged to try when other children participate.
Including Phonology in the Preschool Classroom

• Calendar
  – /k/ calendar, cold, week
  – /s/ sunny, summer, snow
  – /r/ rain, September, year
  – /f/ Friday, February, fair
• Songs/poems – ALSO in books!
  – /k/ Five Little Monkeys
  – /s/ Itsy Bitsy Spider, The Wheels on the Bus
  – /r/ Row, Row, Row Your Boat, The Wheels on the Bus
  – /f/ Five Little Monkeys
More Phonology in the Classroom

• Play activities
  – /k/ cars and trucks, blocks
  – /s/ sand table, school
  – /r/ rolling the ball, rocking the baby, making a road
  – /f/ farm football

• Arts and crafts activities
  – /k/ crayons
  – /s/ scissors
  – /r/ rock painting
  – /f/ finger painting
OH WAIT – Still more!!!!
:-)

- Snacks
  - /k/ popcorn
  - /s/ juice
  - /r/ raisins
  - /f/ fruit
- Book reading
  - /k/ The Very Hungry Caterpillar (Carle)
  - /s/ Cinderella
  - /r/ Are You My Mother (Eastman)
  - /f/ Find My Blanket (Brady)
Targeting language, phonology and phonological awareness in **ONE** session is possible!

- **Target Words**
  - Choose 5/10 words from the story based on your chosen method for target selection – [I generally use natural and optimality – Hodson and Geirut]

- **Read story**
  - THINK about auditory bombardment of ALL target words. Over exaggeration of sound with tactile cueing.

- **Retell story**
  - giving children opportunity to use target words
• **Cloze sentences**
  – to give child opportunity to use target words
  (e.g. “Chances are if he asks for a glass of __________, he’ll want a __________!”)

• **Phonological Awareness Activity**
  – rhyming word with target FC for FCD, initial and final sound awareness, sound manipulation

• **Language Activity**
  – WH ?s setting up opportunities for use of target word.
  – Morphology – plurals and possessives (final /s/)
  – Vocabulary – find books with new words (muck) or that fit theme in classroom (snow, sled, skate)
Duck in the Truck J. Alborough

• Targets –
  – Phonology: Final consonants - /k/ and /g/
  – Morphology: past tense (the duck in the truck was stuck in the muck)
  – Semantics:
    • wh? questions - who croaked from the bush?
    • Vocabulary – stuck, muck, relax, motorboat
  – Phonological awareness: rhyming
Duck in the Truck Activities

• Read story:
  – Auditory bombardment, modeling
    • Attending to and exaggerating target words (duck, truck, stuck, muck, croak)

• Wh ?s, recall,
  – Trucks with questions and pictures of answers:
    • Who croaked from the bush, ‘I’ll help you push?’ (frog)
    • Who relaxed on a motorboat? (goat)
    • What did the goat tie to the boat? (rope)
Activities Cont’d

• Rhyming –
  – Cab of truck and trailor – match ones that rhyme using vocabulary from book
    • Duck – truck
    • Sheep – jeep
    • Goat – boat
    • Stuck – muck
Berenstein Bears Christmas
S. Berenstein

• Targets –
  – Phonology: /s/ blends or stridency deletion (sled, skate, ski, snow)
  – Morphology: present progressives (-ing)
  – Semantics:
    • wh? questions - “Why did Pappa fall?"
    • Predicting – uh oh, what is going happen to Pappa next?
Berenstein Bears Christmas Activities

• Read story:
  – Auditory bombardment, modeling
    • Attending to and exaggerating target words (ski, skate, sled, snow, lots of them in this book!)

• Predicting/Inferencing:
  – What will happen next?
  – Why did pappa fall?
  – Ooh, that looks cold, why?
Activities Cont’d

• White paper roll, cardboard skis and ski poles – go skiing
• Bring a sled and pull children on sled
• If can go outside and build a snowman, do it! Get messy – play is messy!!!
• Have snowcones for snack – make them yourselves and talk about how the water freezes
Drip Drop
Sarah Weeks

• Targets –
  – Phonology: FCD (bed, head, drip, drop, leak, cup)
  – Morphology: regular and irregular past tense
    – ed (climbed, filled, fell, cried)
  – Language:
    • wh?
    • inferencing
  – Phonological awareness: rhyming
Drip Drop Activities

• Read story:
  – Auditory bombardment, modeling
    • Attending to and exaggerating target words

• Retell:
  • Give child chance to use words spontaneously – use the book for cues

• Back to Bed Memory:
  • Pictures of Beds with target process matches
  • Use some minimal pairs: i.e. boat – bow
  • You can play “go fish” or memory with these.
Activities Cont’d

• Questions
  • How is the water getting in?
  • What is a leak?
  • What will he use next?
  • Why can’t he sleep?

• Rhyming –
  – Umbrellas with raindrops of rhymes
    • Each raindrop has rhyming words from story
      Bed – head
      Ran – pan
      Flashed – splashed
      Cup – up
MORE STORIES

• If You Give a Pig a Pancake
• If You Give a Mouse a Cookie
• Snowmen at Night
• The Biggest Best Snowman
• Mrs. McNosh and the Great Big Squash
• The Wind Blew