

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

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## 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.



## 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



## Phonetic vs. Phonological Perspective



### Phonetic Perspective

- Motor based
- Behavioral influence
- Focus on phonemes
- Traditional therapy
- Mild to moderate impairment



### 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
- **Maximal Opposition** (Stenut, J.A. (1989). Maximal opposition approach to phonologic treatment. *JSHD*, 54, 9-19.)
  - Theory: Focus on Least Phonological Knowledge
  - Teaching Method: Maximal Oppositions
  - Activity: Practice with Minimal Pairs
- **Multiple Oppositions** (Williams, L. (2000) Multiple oppositions: Theoretical Foundations for an alternative contrastive approach. *AJSLP*, 9, 282-298. (ASHA Website))
  - 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
  - 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
  - Copula                        He is sad/He is mad
  - Auxiliary                      She is tall/She is small
  - He is shopping/He is hopping

## 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.

## 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.

## 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.

## 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!)

## \*\*Remediation Based on Normal Development

- The acquisition of phonemes and phonological rules is not an all-or-non 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.

## 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

## 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 Geirulf]
- **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

## 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

## 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)

- **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 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 trailer – match ones that rhyme using vocabulary from book
  - Duck – truck
  - Sheep – jeep
  - Goat – boat
  - Stuck – muck

## 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?
  - Ohh, that looks cold, why?

## 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

## 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?

## 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 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

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