Accelerating Progress for Young Children with Severe Speech Sound Disorders

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Why focus on speech sound disorders?
• 10% of school-age children have speech sound disorders.
• 80% are estimated to need services.
• 50-70% will have academic difficulty with risk for literacy problems.
• Children with speech sound disorders represent the largest percentage of school-based clinicians’ caseloads. (Gierut, 1998)

Perspectives
Phonetic
Perceptual
Oral Motor
Phonemic/Phonological

Phonetic Perspective
• Motor based
• Behavioral influence
• Focus on individual phonemes one at a time
• Traditional therapy
• Production errors
• Non stimulable sounds

Perceptual Perspective
• Lack of discrimination of sound contrasts
  – Perception of another’s production
  – Perception of self production
Oral Motor Perspective

• Assumption that both speech and non-speech oral movements are deficient
• Assumption that non-speech oral exercises will assist in development of speech movements
• Frequency associated with apraxia diagnosis

Review of Literature regarding Non-speech Oral Motor Exercises (Forrest, 2002)

“Until evidence from carefully controlled studies is presented to validate the utility of oral motor exercises, the inclusion of non-speech activities in treatment of children with PAD [phonological/articulatory disorders] simply may deplete resources that could otherwise be used for effective intervention procedures.”

Making Decisions Based on the Evidence (Lof, 2007)

• Non speech oral exercises are not supported by:
  – Empirical research
  – Underlying theory
  – What we know about speech production and function

Making Decisions Based on the Evidence (Lof, 2007)

• Some clinicians use non-speech oral motor exercises without evidence for children with:
  – Hearing impairment
  – Phonological disorders
  – Childhood apraxia of speech
  – Articulation disorders (/s/, /r/)

Phonemic/Phonological Perspective

• Severe to profound impairment
• Focus on child’s sound system
• Facilitation of patterns
• Focus on assessment
• Focus on target selection
• Target occasional use
• Consider stimulability

Treatment Approaches

• Traditional
• Motoric Automaticity
  – (begin at syllable level)
• Cycles
• Minimal Pairs
Implications of the Phonological Perspective for Clinical Practice

- Target Selection
- Assessment
- Intervention??

Target Selection

Assumptions about Target Selection
- Earlier or later developing sounds?
- Absent or inconsistent sounds?
- Stimulable or non-stimulable sounds?
- Less or more linguistic complexity?
- One or more than one target sound?
- Targets from the same class or different classes?
- Clusters or singletons?

Meet Bryce, a kindergarten student

Which targets would you select for him?

BP - Errors

Significant phonologic processes (score 3 or more): assimilation, final consonant deletion, weak syllable deletion, stopping, gliding, cluster simplification, depalatalization, backing.

Re-thinking Target Selection

Based on the Work of Gierut and Colleagues
Types of Phonological Knowledge

- Articulation
- Perception
- Phonological rules and phonotactic constraints

Evidence of Phonological Knowledge

- Perception
- Stimulability
- Production
- Acoustic/Instrumental

Perception (Rvachew, 2005)

- Structural and functional integrity of the auditory and speech perception mechanisms
- Appropriate input for contrasting phoneme categories
- Appropriate cognitive/linguistic processing
- Rvachew (2004) found that traditional articulation therapy + perceptual training, and training in letter identification, sound-symbol relationship and onset identification resulted in greater progress than articulation therapy alone.

Stimulability (Rvachew, 2005)

- Structural and functional integrity of the speech mechanism
- Appropriate input (visual, tactile, kinesthetic information) about the required articulatory gestures
- Imitation skills
- Focus and motivation

Relationship between phonemic perception and stimulability across 3 studies with 53 children (Rvachew, 2005)

<table>
<thead>
<tr>
<th>Study</th>
<th>+Perceive +Stimulable</th>
<th>-Perceive +Stimulable</th>
<th>+Perceive -Stimulable</th>
<th>-Perceive -Stimulable</th>
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<tbody>
<tr>
<td>Lof, 1996</td>
<td>6</td>
<td>10</td>
<td>9</td>
<td>5</td>
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<tr>
<td>Rvachew et al., 1999a</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Rvachew et al., 1999b</td>
<td>10</td>
<td>2</td>
<td>6</td>
<td>8</td>
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<tr>
<td>TOTALS</td>
<td>26</td>
<td>15</td>
<td>16</td>
<td>20</td>
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</tbody>
</table>

Six types of Productive Phonological Knowledge displayed by children with phonological disorders (Gierut, 1987)

<table>
<thead>
<tr>
<th>Lexical Representation</th>
<th>Breadth of Distribution</th>
<th>Phonological Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 adult-like</td>
<td>all pos/all mor</td>
<td>none</td>
</tr>
<tr>
<td>2 adult-like</td>
<td>all pos/all mor</td>
<td>optional or obligatory rules</td>
</tr>
<tr>
<td>3 adult-like</td>
<td>all pos/some mor</td>
<td>fossilized forms</td>
</tr>
<tr>
<td>4 adult-like</td>
<td>some pos/all mor</td>
<td>positional constraint</td>
</tr>
<tr>
<td>5 adult-like</td>
<td>some pos/some mor</td>
<td>combination of types</td>
</tr>
<tr>
<td>6 non-adult-like</td>
<td>all pos/all mor</td>
<td>inventory constraint</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td></td>
</tr>
</tbody>
</table>
Six types of phonological Knowledge (Gierut et al., 1987) **Type 1**

- A child displaying Type 1 knowledge of target /s/ would produce this sound correctly in all word positions and for all morphemes. /s/ would never be produced incorrectly.

  - Examples:  
    - [si] see  
    - [sup] soup  
    - [mɔsi] messy  
    - [məsi] missing  
    - [mɔsi] miss

Six types of phonological Knowledge (Gierut et al., 1987) **Type 2**

- A child displaying Type 2 knowledge of target /s/ would produce the sound correctly for all morphemes and positions. However, a phonological rule would apply to account for observed alternations between, for example, /s/ and /t/ in morpheme-final position.

  - Examples:  
    - [si] see  
    - [sup] soup  
    - [mɔsi] messy  
    - [məsi] missing  
    - BUT [kɔsi]→[kt] kiss  
    - [mɔsi]→[mt] miss

Six types of phonological Knowledge (Gierut et al., 1987) **Type 3**

- A child displaying Type 3 knowledge of target /s/ would produce this sound correctly in all positions. However, certain morphemes that were presumably acquired early and acquired incorrectly (fossilized forms) would always be produced in error.

  - Examples:  
    - [si] see  
    - [mɔsi] messy  
    - BUT [nænɘ] Santa  
    - [wu] juice

Six types of phonological Knowledge (Gierut et al., 1987) **Type 4**

- A child displaying Type 4 knowledge of target /s/ would produce the sound correctly for all morphemes in, for example, initial position. However, production of /s/ would be incorrect for all morphemes in medial and final positions.

  - Examples:  
    - [si] see  
    - [sup] soup  
    - BUT [mɔt] messy  
    - [mɔt] missing  
    - [kɔt] kiss  
    - [mɔt] miss

Six types of phonological Knowledge (Gierut et al., 1987) **Type 5**

- A child displaying Type 5 knowledge of target /s/ would produce this sound correctly in, for example, initial position. However, only some morphemes in this position would be produced correctly. All /s/ morphemes in post-vocalic positions would be produced incorrectly.

  - Examples:  
    - [si] see  
    - [sup] soup  
    - BUT [top] soap  
    - [skɔ] sock  
    - [mɔt] messy  
    - [kɔt] kiss

Six types of phonological Knowledge (Gierut et al., 1987) **Type 6**

- A child displaying Type 6 knowledge of target /s/ would produce this sound incorrectly in all word positions and for all morphemes. /s/ would never be produced correctly.

  - Examples:  
    - [ti] see  
    - [tup] soup  
    - BUT [mɔt] missing  
    - [mɔt] miss  
    - [kɔt] kiss
Target Selection Issues:
(Gierut et al.)

**WHAT to work on:**
- Stimulable/non-stimulable
- Most/least phonological knowledge
- Early/late developing
- Least/most marked
  (linguistically complex)

Target Selection based on **Phonological Knowledge**
(Gierut, Elbert, Dinnsen, 1987)

- Examined children’s phonological knowledge before and after treatment
- 6 children
- Began treatment at different points on the continuum of their phonological knowledge

Implications for target selection based on **Stimulability**
(Powell, Elbert & Dinnsen, 1991)

- Targeting stimulable sounds provides faster generalization of production of the target sound in other contexts.
- Targeting non-stimulable sounds provides more widespread generalization to other sounds and sound classes.

Target selection based on **Order of Acquisition of Sounds**
(Powell & Elbert, 1984)

- Examined treatment of early and later developing clusters -- stop liquid and fricative liquid
- 6 children
- Children could produce all sounds as singletons prior to treatment unlike previous study

Target selection based on **Order of Acquisition of Sounds**
(Powell & Elbert, 1984)

- Targeting earlier and later developing clusters both provided generalization to both treated and untreated categories.
- Differential learning patterns were noted among children.
- One child who was taught early developing did not generalize to later.
- All children who were taught later developing did generalize to earlier.
Target selection based on Order of Acquisition of Sounds (Gierut, Morrise, Hughes, Rowland, 1996)

• Within and across subject comparison of treatment of early versus late developing sounds
• Examined learning of the treated sounds and generalization to other sounds
• 9 subjects

Target Selection based on Order of Acquisition of Sounds (Gierut, Morrise, Hughes, Rowland, 1996)

• Greater learning occurred for later developing sounds.
• Later developing sounds showed more continued improvement post treatment.
• Teaching later developing sounds produced greater system wide change.

Target selection based on Order of Acquisition of Sounds (Gierut, Morrise, Hughes, Rowland, 1996)

• Targeting early developing sounds provided greater generalization of the sound to other contexts.
• Targeting later developing sounds provided greater generalization to other sounds and sound classes.

Target Selection based on Order of Acquisition & Phonological Knowledge (Rvachew & Nowak, 2001)

• 48 children with moderate to severe phonological disorders
• 24 received treatment on early developing sounds with greater productive knowledge
• 24 received treatment on later developing sounds with little or no knowledge
• Measured progress toward acquisition during 2 blocks of 6 weekly sessions for 2 sets of 2 sounds

Target Selection based on Order of Acquisition & Phonological Knowledge (Rvachew & Nowak, 2001)

• Improvement occurred for untreated stimulable phonemes, but little improvement occurred for untreated unstimulable phonemes
• Confirmed the need to find ways to help children imitate sounds
Target Selection  
(Elbert, Dinnsen, Powell, 1984)
- Three research questions:
  - Generalization to treated sound classes versus untreated?
  - Performance on known versus unknown sound classes?
  - Implicational factors?
- Six children in pairs
- Treated on stop-liquid OR fricative liquid
- Traditional minimal pair treatment

- Generalization occurred only to stop liquid when stop liquid was trained and child had no knowledge of fricative liquid.
- Generalization occurred to both stop liquid and fricative liquid when fricative liquid was trained and/or when child had some phonological knowledge of fricative liquid.

Teaching Clusters  
(Williams, 1991)
- Hypothesis based on Gierut’s work:
  - Teaching two new sounds in a cluster may result in acquisition of two new sounds and clusters.
- Results:
  - If the child had some knowledge of the sounds and no sequences, learning occurred.
  - If the child had sequences and inventory constraints for the sounds, learning occurred.
  - If the child had inventory constraints for the sounds and did not have sequences, learning did not occur.

- If the child can make the more marked (harder) sound, he can make the less marked (easier) sound.

Markedness and Major Sound Classes  
(Gierut, 1999)
- Markedness
  - Order of least to most markedness
  - Obstruants
    - stops – fricatives – affricates
  - Sonorants
    - nasals – glides – liquids
  - Sonority sequence markedness
    - most to least sonorant versus similarity
  - More marked assumes less marked
    - if the child can make the more marked (harder) sound, he can make the less marked (easier) sound.

Clusters and Adjuncts  
(Gierut, 1999)
- Real clusters versus adjuncts
  - Clusters: from less to more sonority
    - stop glide, fricative glide
  - Adjuncts: /s/ stop
- Sonority Sequencing Principle
  - Easier clusters are those which have the greatest difference in sonority between the first and second segment: /pl/ over /fl/

- Adjuncts (s-stop clusters) are less marked (easier) than other clusters and therefore do not generalize to clusters.
- More marked clusters generalize to many clusters. /fl/ to /pl/, /br/, /kw/
- Less marked clusters generalize only to in-class clusters, not to others.
  - /pl/ to /bl/, /kl/, /gl/
Selection of Words for Target Sound Practice

Influence of Word Frequency on Phonological Change (Morissette & Gierut, 2002)

- 4 children who were trained with either high frequency or low frequency words
- Treatment of high frequency words resulted in greater generalization to treated and untreated sounds within and across sound classes

Designing Phonological Intervention

Minimal Pair Selection

The work of Gierut and Others

Principles of Phonological Intervention (Fey, 1992)

- modification of groups of sounds that share a common pattern
- less emphasis on correct sound production and focus on neutralized contrasts
- more emphasis on using speech sounds for communication purposes

Phonological Intervention (Fey, 1992)

"I believe that there is only one therapy procedure that embodies all of the three principles ... It has as its basic underlying principles the notion of "minimal contrast" and the functional use of speech to transmit unambiguous messages."

Minimal Pairs

- Definition
  - Two words that differ by only one phoneme
Assumptions about the nature of the contrasting pairs

- Target versus substituted sound
- Target versus another established sound
- Two new target sounds
- Multiple targets versus substituted sounds

Types of Feature Oppositions in Minimal Pairs

Minimal Oppositions
Child’s error contrasted to target

- [we] → ray
- [wek] → rake
- [tot] → coat
- [ti] → see
- [ti] → she
- [wek] → lake
- [do] → go

Minimal Feature Oppositions

- toe
- hit
- toe
- goat
- nail
- bat
- comb
- do
- sew
- hick
- doe
- coat
- sail
- back
- cone
- zoo

Maximal Oppositions:
Maximal number of features

- run
- sew
- fast
- cone
- show
- peak
- man
- lead
- pun
- go
- last
- phone
- bow
- zeal
- ran
- feed

Maximal Pair Treatment
Child’s target contrasted to maximally different sound

- Child’s production
  - /we/ new & old
  - /to/ new & old
  - /tæn/ new & old
  - /wet/ two new
  - /tu/ two new
  - /to/ two new
- Target
- Contrast
  - re
  - pe
  - sew
  - bow
  - can
  - man
  - late
  - Kate
  - coo
  - sue
  - show
  - go
### Maximal Pair Treatment

**Teaching 2 new phonemes**

- **Child’s repertoire**
  
  - \( p, t \)
  - \( b, d \)
  - \( f, h \)
  - \( v \)
  - \( m, n \)

### Target Selection: Nature of Oppositions (Gierut, 1989)

- The child learned 16 new initial consonants with only 3 sets of maximal oppositions.
- The child reorganized his phonological system to include word initial consonants.

### Target Selection: Nature of Oppositions (Gierut, 1990)

- **Differential Learning of Phonological Oppositions**
  - 3 subjects - missing sounds:
    - 1: /\( \theta, \varepsilon, s, z, j, s, l, r/\)
    - 2: /\( k, g, f, v, 0, \gamma, l, t/\)
    - 3: /\( k, g, v, 0, \gamma, z, t, j, d, l, r/\)

  - Paired a sound that they *used* with a **maximally** different sound and with a **minimally** different sound in two conditions.

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### Minimal Pair Selection

(Gierut et al.)

**HOW to work on it: Minimal Pair Contrasts**

- **Minimal/maximal** oppositions
- **One/two** new sound(s)

### Target Selection:

**Nature of Oppositions** (Gierut, 1989)

- **Maximal Opposition Approach to Phonological Treatment**
  - **one child**
    - initial consonant deletion with nearly complete phonetic inventory except \( /f, v, r/\)
    - \( /m, b, w, j/\) used in initial position
  - Paired a sound that he used in the initial position contrasted with a **maximally** different sound: e.g. \( /s/\) contrasted with \( /m, b, w/\)
<table>
<thead>
<tr>
<th>Target Selection: Nature of Oppositions (Gierut, 1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Maximal pairs</strong> resulted in greater improvement in target sounds, more additions of untreated sounds and less over generalization to known sounds.</td>
</tr>
</tbody>
</table>
| • Learning was enhanced by **maximal differences and major class distinctions**:
  - multiple and major class distinctions > multiple distinctions > few distinctions |

<table>
<thead>
<tr>
<th>Target Selection: Nature of Oppositions (Gierut, 1992)</th>
</tr>
</thead>
</table>
| • Replication of previous studies investigating:
  - number of feature differences in pairs
  - nature of feature class distinctions
  - relationship to child’s pre-treatment grammar
• Added treatment of two new sounds
• 4 children |

<table>
<thead>
<tr>
<th>Target Selection: Nature of Oppositions (Gierut, 1992)</th>
</tr>
</thead>
</table>
| • **Greatest widespread system change**:
  - minimal pairs comparing two new phonemes differing by **maximal and major class features**.
  - The major class distinction may be more important than the number of features. |

<table>
<thead>
<tr>
<th>Target Selection: Nature of Oppositions (Gierut, 1992)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• “This result suggests that it may be unnecessary to teach children that newly learned phonemes are in some way related to other existing phonemes in their grammar by setting up explicit minimal pair comparisons” (p. 1056)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Selection: Multiple Oppositions (Williams, 2000)</th>
</tr>
</thead>
</table>
| • Larger treatment sets of multiple phonemic contrasts
• Intervention across a broader spectrum of a child’s error pattern, rule or phoneme collapse.
• Contrast single substitution with multiple targets that are collapsed to that substitution |
Target Selection: Multiple Oppositions (Williams, 2000)

- Child’s system: *l/s, ʃ, w*

- Contrast Pairs:
  - *let – set*
  - *see – she*
  - *lay – way*

  - *hat – fat*
  - *hay – they*
  - *he – she*
  - *hi – sigh*
  - *who – chew*

Target Selection: Multiple Oppositions

- Child’s system: *t/s, ʃ, k*

- Contrast Pairs:
  - *tea – see*
  - *tea – she*
  - *tea – key*
  - *two – chew*

  - *do – zoo*
  - *doe – Joe*
  - *doe – go*
  - *doe – though*
  - *D – Z*

Principles for making this work in the school setting

- A Winning Formula (Rvachew, 2004):
  - traditional articulation therapy
  + perceptual training
  + training in letter identification
  + training in sound-symbol relationships
  + onset identification

  = in greater progress than articulation therapy alone.

How does this work in the School-based SLP world?

- Assessment
- Materials
  - Maximal contrast
  - Multiple targets
- Can I really teach clusters?

Ramifications for Assessment

*The selection of treatment targets based on phonological assessment has the potential to maximize treatment outcome, and therefore, plays a major role in treatment efficacy.*

*Williams, 2002*

How does this work in the school SLP world?

- Gierut: 19-23 sessions
- SS: 29 sessions
- BP: 1x/week, poor general attendance
Assessment

- Choose an assessment with a large sample of words and phonemes in multiple contexts
- “Deep test” error sounds
- Language sample
- Phonemic inventory

Assessment - Phonemic Inventory

<table>
<thead>
<tr>
<th>Obstruent</th>
<th>Stops</th>
<th>S</th>
<th>B</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>Fricatives</td>
<td>t</td>
<td>v</td>
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<td></td>
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<td>Affricates</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Nasals</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids</td>
<td>l</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td>w</td>
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</table>

Significant phonologic processes (score 3 or more): assimilation, final consonant deletion, weak syllable deletion, stopping, gliding, cluster simplification, depalatalization, backing

BP - Errors

Applying Gierut’s Clinical Decision Tree for Bryce

0% Accuracy x Contexts

Stimulable

Non-Stimulable

Non-Stimulable

Early Acquired

Later Acquired
Applying Gierut's Clinical Decision Tree for Bryce

Later Acquired

Obstruents

Sonorants

Minimal PVM Differences

Maximal PVM Differences

Maximal PVM Differences

Low Frequency Word Pairs

High Frequency Word Pairs

The Phonology Funnel

1. Least Productive Phonological Knowledge
2. Nonstigmatizable Phonemes
3. Later Acquired Phonemes
4. Most Linguistically Complex Phonemes

Selecting Targets

<table>
<thead>
<tr>
<th>Obstruent</th>
<th>Stops</th>
<th>p, h</th>
<th>b</th>
<th>f, v</th>
<th>k, g</th>
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<tbody>
<tr>
<td>Fricatives</td>
<td>s, sh, s, r, f, v</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Affricates</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids</td>
<td>t, r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td>w, j</td>
<td></td>
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</tbody>
</table>

BP - Applying Gierut's Clinical Decision Tree

<table>
<thead>
<tr>
<th>Obstruent</th>
<th>Stops</th>
<th>p, h</th>
<th>b</th>
<th>f, v</th>
<th>k, g</th>
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<tr>
<td>Glides</td>
<td>w, j</td>
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Intervention

Additional Strategies

• Road to the Code
  – Evidence-based practice for phonemic awareness
• Say it and Move it

• Road to the Code
• Stimulability training - the “Magic Wand”
• Adding a rime to onsets
  – Use target sounds or stimulability targets in rime

• Visual feedback
• Auditory feedback
• Kinesthetic engagement

Target Words and Pairs

<table>
<thead>
<tr>
<th>she (high frequency)</th>
<th>go (high frequency)</th>
<th>shoe - go</th>
</tr>
</thead>
<tbody>
<tr>
<td>shake - rake</td>
<td>wish - wig</td>
<td>ship - rip</td>
</tr>
<tr>
<td>shack - rack</td>
<td>fish - fig</td>
<td></td>
</tr>
<tr>
<td>sheep - keep</td>
<td>ghost - mast</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>jump - pump</th>
<th>jolly - Molly - Polly - Wally</th>
<th>jelly</th>
</tr>
</thead>
<tbody>
<tr>
<td>joke - poke</td>
<td>jam - Pam - wham</td>
<td>gerbil</td>
</tr>
<tr>
<td>juice - moose</td>
<td>jar - car</td>
<td></td>
</tr>
<tr>
<td>Jeep - peep</td>
<td>Jack - pack</td>
<td></td>
</tr>
</tbody>
</table>
Target Words and Pairs

<table>
<thead>
<tr>
<th>jump</th>
<th>pump</th>
<th>jolly</th>
<th>Polly</th>
<th>Wally</th>
</tr>
</thead>
<tbody>
<tr>
<td>dump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>clump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>joke</td>
<td>poke</td>
<td>jam</td>
<td>Pam</td>
<td>wham</td>
</tr>
<tr>
<td>juice</td>
<td>moose</td>
<td>Jill</td>
<td></td>
<td>pill</td>
</tr>
<tr>
<td>Jeep</td>
<td>peep</td>
<td></td>
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</tr>
</tbody>
</table>

BP - Pretest

<table>
<thead>
<tr>
<th>Obstruent</th>
<th>Stops</th>
<th>p, b, t</th>
<th>k, g</th>
<th>s, z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fricatives</td>
<td>f, v</td>
<td>s, z</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affricates</td>
<td>w, v</td>
<td>t, d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids</td>
<td>m</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td>w</td>
<td></td>
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</tr>
</tbody>
</table>

Significant phonologic processes (score 3 or more): assimilation, final consonant deletion, weak syllable deletion, stopping, gliding, cluster simplification, depalatalization, backing

BP - Post-test 5 months

So how do I put this in an IEP?

- Writing present levels of performance
- What is your ultimate goal?
- Progress monitoring

Brice - Present Levels

On the Clinical Evaluation of Language Fundamentals-Preschool, Brice’s scores fell within the expected range for his age, with the exception of Expressive Vocabulary, which was below average. He also demonstrated the following syntax errors: pronoun substitution (them/they, her/she), regularization of past tense (fallen/fell), deletion of plural forms and verb endings, and weak syllable deletion. On phonological testing, Brice demonstrated errors on the following sounds: [TH, t, d, s, z, sh, ch, dg, j, v] and consonant clusters. He also demonstrated the following phonological deviations: backing, weak syllable deletion, stopping, gliding, vocalization, and cluster reduction. His spontaneous speech intelligibility is estimated at 60%, based on a language sample.

Writing IEP Goals

- Think in terms of intelligibility
- “During a spontaneous language sample of at least 50 utterances, at least 70% of words spoken will have all phonemes (sounds) produced correctly.” WPC = words produced correctly
- Objectives may be written with respect to maximal pairs, processes, or specific phonemes
Brice - Annual Goal

In a spontaneous language sample of at least 50 utterances, at least 75% of words spoken by Brice will be produced correctly.

Brice - Sample Objectives

1. Brice will imitate maximal word pairs (such as shook/cook) containing his target sounds correctly 8/10 trials.
2. Brice will name familiar maximal pairs containing his target sounds correctly 8/10 trials.
3. Brice will imitate sentences containing pronouns he, she, they correctly 8/10 trials.

Writing IEP Goals

- Objectives may be written with respect to maximal pairs, processes, or specific phonemes

Worth the time?

- One hour of analysis may equal less than a year of therapy
- Global change and generalization
- “Sign me up for speech next year!”

REFERENCES


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