CHILDREN WITH PHONOLOGICAL DISORDERS: ASSESSMENT

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CHILDREN WITH PHONOLOGICAL DISORDERS

SURFACE MANIFESTATIONS

• Developmental Phonological Disorders; Speech Sound Disorders
• Children who misarticulate more sounds than their same age peers.
• Accurate identification of children with PD depends on knowledge of:
  o Normal speech development
  o Speech errors typical of children with PD.
• Speech errors change as child gets older / vary with severity of PD.

CHILDREN WITH PHONOLOGICAL DISORDERS

UNDERLYING MANIFESTATIONS

• Increasing support for a genetic cause.
• Increasing support for a core deficit in phonological processing for the vast majority of these children.
• To provide effective intervention for these children, knowledge about the underlying cause is required.
ASSESSMENT
PURPOSE AND DOMAINS

ASSESSMENT
PURPOSE
Diagnostic questions
Does the child have a phonological disorder?
If so, indication of which type/causes?
If so, what severity level?
Are there other concomitant impairments in other domains?

Intervention questions
Does the child need intervention?
What are the most important treatment goals?
What is the most appropriate treatment approach for the child?
What is the most effective and efficient service delivery model?

ASSESSMENT
DOMAINS
Body or body part
Impairment
Whole child
Activity limitations
Child in social context
Participation restrictions
### ASSESSMENT

#### BODY OR BODY PART IMPAIRMENT

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Treatment Planning</th>
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<tbody>
<tr>
<td>Standardized measures of articulation/phonology; speech sample.</td>
<td>Measures of knowledge of linguistic units at multiple levels of the phonological hierarchy at three levels of phonological knowledge (analysis of single words and speech sample).</td>
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<tr>
<td>Measures of functioning in other speech domains (voice, resonance, fluency).</td>
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<tr>
<td>Standardized measures of function in other language domains.</td>
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<tr>
<td>Standardized measures of functioning in other areas of development (cognitive, motor, social, etc.).</td>
<td>Measures of phonological processing that tap multiple levels of phonological knowledge and varying linguistic units (e.g., phonemic perception; phonological awareness of onsets, rimes, phonemes; nonword repetition).</td>
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<tr>
<td>Measures of hearing acuity and central auditory function.</td>
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<tr>
<td>Standardized measures of oral motor structure and function; feeding assessment.</td>
<td>Stimulability testing.</td>
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#### ASSESSMENT

#### ACTIVITY LIMITATIONS

<table>
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<tr>
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<tr>
<td>Measures of speech accuracy in connected speech (e.g., PCC).</td>
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<tr>
<td>Standardized measures of speech intelligibility.</td>
<td>Standardized measures of speech intelligibility.</td>
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<tr>
<td>Ratings of speech intelligibility in everyday environments.</td>
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#### ASSESSMENT

#### PARTICIPATION RESTRICTIONS

<table>
<thead>
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<th>Treatment Planning</th>
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<tr>
<td>Structures measures of participation (e.g. FOCUS).</td>
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<tr>
<td>Parent, teacher, and child interviews.</td>
<td>Observation of child in multiple contexts.</td>
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<tr>
<td>Case history form.</td>
<td>Diagnostic therapy.</td>
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</table>
**Suggested Assessment Plan**

Fig. 5.1 of Rvachew, S., & Brosseau-Lapré, F. (2012). Developmental Phonological Disorders: Foundations of Clinical Practice. Plural Publishing

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**SPEECH SAMPLE**

**ELICITATION & ANALYSIS**

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**SPEECH SAMPLE**

**ELICITATION PROCEDURES**

- Only about 1/3 of SLPs consistently elicit connected speech samples for children suspected of presenting with a phonological disorder.
  - Time constraints?
  - Lack of transcription skills?
- Feasible to obtain an adequate speech sample (100-200 words) in 10-15 minutes.
SPEECH SAMPLE

ADVANTAGES

- More errors in connected speech.
- More errors in syntactically or semantically complex contexts (e.g., verbs vs. nouns).
- Stress pattern influences (i.e. stressed more accurate than unstressed).
- Word position influences (e.g., initial weak syllables).
- Majority of children with speech impairments have associated language impairments.

SPEECH SAMPLE

ELICITATION PROCEDURES

- Spontaneous
  - Ideal. No model of targeted speech content is provided to the child.
- Delayed imitation.
  - Some studies have found similar performance in delayed imitation and spontaneous elicitation conditions.
- Direct imitation.
  - Try to avoid. Studies reported anywhere from negligible to large proportions of words being produced in a more adult-like manner when compared to spontaneous elicitation.
  - Imitative productions may not be more accurate.
  - It varies by child (age, whether they had previous SLP intervention).

SPEECH SAMPLE

ELICITATION PROCEDURES

- Effective sampling conditions:
  - Free play.
  - Story.
  - Routines.
  - Interview.
  - Scripted Story.
- Important variables:
  - Examiner questions.
  - Sampling materials.
  - Instructions to third parties.
SPEECH SAMPLE

ANALYSIS

- Selecting and organizing words for analysis:
  - Up to 100 words, from sample and if necessary, single-word articulation test.
  - Transfer orthographic form; fill in adult and child transcription with syllable boundaries.
- Determine if the sample addresses all levels of the phonological hierarchy (phrase, word, syllable, segment, feature).
  - Supplemental sampling if necessary.

Multilinear Phonology: Prosodic hierarchy

Word Shape Structures

- Are there enough words to establish a pretreatment baseline performance for the various word shapes?
- Are there complexity effects related to the number of consonants in the word?
- Differences between vowel-initial and consonant-initial variants of words?
- Differences between vowel-final and consonant-final variants of words, such as CCV versus CCVC?
- Do diphthongs affect the production of a particular word shape, such as CVC versus CVCC?

Segmental Content of Word Shapes

- Is a variety of segments represented in the multiple tokens of the same word shape?
- Is the accurate production of words facilitated by segment similarity, such as CSVCC versus CVC?
- Do morphological endings facilitate production of a word shape, such as CVC word more likely to be produced accurately when the final consonant is a plural /s/?

Adapted from Bernhardt & Holigrapher (2001).
MULTILINEAR ANALYSIS

GOALS

• Provide a systematic description of the child's underlying representations at all levels of the phonological hierarchy, as well as the relationship between these levels.
• Mismatches in the child's phonological knowledge in relation to the adult system are identified for all levels of the phonological hierarchy (phrase, word, syllable, segment, feature and associations between tiers).

MULTILINEAR ANALYSIS

OUTCOMES

• Structures that are present in the child's underlying system.
• Structures that are absent in the child's underlying system.
• Rules that explain the child's productive output.
  o Delinking.
  o Spreading.
MULTILINEAR ANALYSIS

STEPS & DEMONSTRATIONS

- Quick multilinear analysis demonstration:
  - Syllable and word shape inventory.
  - Segmental and feature analyses:
    - Substitution analysis.
    - Inventory by syllable position.
    - Feature match ratios.
    - Interaction between tiers.

PHONOLOGICAL PROCESSING Ax TOOLS

SPEECH PERCEPTION

- Goal: determine whether the child's underlying acoustic-phonetic representation is accurate.
  - Assess the child's perception of the target sounds in comparison to the misarticulated sound.
  - Identification task rather than discrimination task.
  - Multiple trials and control items.
- For Midwestern North American English:
  - Speech Assessment and Interactive Learning System (SAILS; www.medicine.mcgill.ca/srvachew).

PHONOLOGICAL PROCESSING Ax TOOLS

PHONOLOGICAL AWARENESS

- For children with unintelligible speech, non-verbal tasks are extremely useful (either alone, or in combination with traditional PA measures requiring a verbal response).
  - Phonological Awareness Test by Bird, Bishop and Freeman (1995).
    - Long history of use with preschoolers with PD.
  - Silent Deletion of Phonemes Task (Claessen, Leitao, and Barrett, 2010).
    - Very useful for children in first grades of school.
PHONOLOGICAL PROCESSING AT TOOLS

NONWORD REPETITION

- Syllable Repetition Task (SRT; Shriberg et al., 2009).
  - Only one vowel and four consonants that are accurately produced by young children with PD.
  - Eight 2-syllable items (CVC, such as dama)
  - Six 3-syllable items (CVCVC, such as bamana)
  - Four 4-syllable items (CVCVCVC, such as manabada)
  - Available from: http://www.waisman.wisc.edu/phonology; click on Phonology Project, then Publications & Presentations, then Technical Reports (see Report 14).

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