Interpreting Clinical Cases for Speech Pathologists: Understanding the psychometrics of the Pearson speech-language assessments: DEAP, CTOPP-2 PPVT-4 and EVT-2

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Scoring FAQs

Scoring FAQs

Evie 3 years 4 months TD

Background information

Evie was seen during screening at nursery.

Diagnostic screen

Evie made the following errors: /θæŋkju/ → [saŋkju] and /helikptə/ → [helitpə]. She was able to imitate both sounds that she produced in error and her inconsistency rate was 0%. The sound /θ/ is not expected to be produced by all children until 6;0. Evie’s substitution of [s] for /θ/ was observed in the normative sample. At the time of the nursery screening Evie’s fronting pattern was age appropriate. However, children over the age of 3;5 should not be fronting. In cases where children are using processes just within an age appropriate band a review screen a few months later will confirm that their speech has continued to develop.
Joshua 4 years 5 months ICD

Background information

Joshua was referred to a research project by the local health authority speech and language therapy service. He was diagnosed as having a phonological disorder and was on the waiting list for therapy. He completed a battery of language assessments (refer to Table 5.4 for his test performance scores). Joshua’s hearing acuity was screened and found to be within normal limits.

Table 5.4 Joshua’s assessment results

<table>
<thead>
<tr>
<th>Assessments</th>
<th>Standard score (percentile)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Evaluation of Language Fundamentals</strong></td>
<td></td>
</tr>
<tr>
<td>–Preschool UK</td>
<td></td>
</tr>
<tr>
<td>Linguistic concepts</td>
<td>15 (95)</td>
</tr>
<tr>
<td>Basic concepts</td>
<td>11 (63)</td>
</tr>
<tr>
<td>Sentence structure</td>
<td>11 (63)</td>
</tr>
<tr>
<td>Receptive language Score</td>
<td>114 (82)</td>
</tr>
<tr>
<td><strong>Renfrew Word Finding Test</strong></td>
<td>Raw score =17; Age equivalent: 3.4</td>
</tr>
<tr>
<td><strong>British Picture Vocabulary Scales</strong></td>
<td>110 (74)</td>
</tr>
<tr>
<td><strong>Preschool Inventory of Phonological Awareness</strong></td>
<td></td>
</tr>
<tr>
<td>Rhyme awareness</td>
<td>11 (63)</td>
</tr>
<tr>
<td>Alliteration awareness</td>
<td>9 (37)</td>
</tr>
<tr>
<td>Syllable segmentation</td>
<td>12 (75)</td>
</tr>
<tr>
<td><strong>Children’s Test of Nonword Repetition</strong></td>
<td>Raw score = 1 (below norm)</td>
</tr>
</tbody>
</table>
Diagnostic Screen

Joshua produced 5 out of the 10 targets differently on the two trials. He was able to imitate all error sounds in isolation. In accordance with the instructions for the Diagnostic Screen, the Oro-motor and Inconsistency assessments were administered.

Oro-motor assessment

- DDK - Joshua scored 6/9 on DDK (Standard score 10, 50th percentile). He had incorrect consonant sequences in four trials. He had clear pronunciation in three trials and fluent pronunciation in all trials.
- Isolated movements - Joshua scored 11/12 (Standard score 10, 50th percentile).
- Sequenced movements - Joshua scored 18/18 on sequenced movements (Standard score 13, 84th percentile).

Inconsistency Assessment

Joshua produced 48% of target words (i.e. 12) differently across the three trials (see Table 5.5). Figure 5.1 illustrates the variability of his productions.

Table 5.5 Joshua’s performance on the inconsistency assessment

<table>
<thead>
<tr>
<th>Target</th>
<th>MPA</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. shark</td>
<td>shak</td>
<td>[shak]</td>
<td>[shak]</td>
<td>[shak]</td>
<td>1</td>
</tr>
<tr>
<td>2. boat</td>
<td>boat</td>
<td>[boat]</td>
<td>[boat]</td>
<td>[boat]</td>
<td>0</td>
</tr>
<tr>
<td>3. rain</td>
<td>reen</td>
<td>[reen]</td>
<td>[reen]</td>
<td>[reen]</td>
<td>0</td>
</tr>
<tr>
<td>4. table</td>
<td>tabel</td>
<td>[tabel]</td>
<td>[tabel]</td>
<td>[tabel]</td>
<td>0</td>
</tr>
<tr>
<td>5. birthday cake</td>
<td>birthday cake</td>
<td>[birthday cake]</td>
<td>[birthday cake]</td>
<td>[birthday cake]</td>
<td>0</td>
</tr>
<tr>
<td>6. jump</td>
<td>jump</td>
<td>[jump]</td>
<td>[jump]</td>
<td>[jump]</td>
<td>1</td>
</tr>
<tr>
<td>7. program</td>
<td>program</td>
<td>[program]</td>
<td>[program]</td>
<td>[program]</td>
<td>0</td>
</tr>
<tr>
<td>8. bicycle</td>
<td>bicycle</td>
<td>[bicycle]</td>
<td>[bicycle]</td>
<td>[bicycle]</td>
<td>1</td>
</tr>
<tr>
<td>9. apple</td>
<td>apple</td>
<td>[apple]</td>
<td>[apple]</td>
<td>[apple]</td>
<td>0</td>
</tr>
</tbody>
</table>

Total score: 12
Consistency score: 46%
Joshua 4 years 5 months ICD

Interpretation

Joshua presented with an inconsistent speech disorder. He presented with age-appropriate oro-motor skills, was able to imitate all sounds in isolation, and his production of the same lexical item was variable.

For example, /θ/ was realised as /tʃ, t, d/ and /ʃ/ was realised as /θ, l, t/. As can be seen from Table 5.5, Joshua also inserted and omitted consonants and syllables. Unlike many children who have inconsistent speech, Joshua’s vowels were produced consistently.

Natalie 6 years 8 months DVD

Background information

A paediatric speech and language therapist assessed Natalie in a community clinic.

Diagnostic Screen

Natalie produced 5 out of the 10 targets differently on the two trials. She was unable to imitate /tʃ, dʒ, θ, ñ, s, z/ in isolation. She glottalised intervocalic consonants and deleted all word final sounds except nasals. The Articulation, Oro-motor and Inconsistency assessments were administered.

Articulation assessment

In addition to the sounds Natalie could not imitate in the Diagnostic Screen, she could not imitate /ð, j, ʒ, ɹ, v/.
Oro-motor assessment

- DDK - Natalie scored 3/9 on DDK (Standard score 3, 1st percentile).
- Isolated movements - Natalie scored 7/12 (Standard score <3, 1st percentile).
- Sequenced movements - Natalie scored 15/18 (Standard score 7, 16th percentile).

Her performance was well below that expected for her chronological age.

Inconsistency Assessment

Natalie produced 60% of target words (i.e. 15) differently across the three trials (see Table 5.6).

Table 5.6 Natalie’s performance on the inconsistency assessment

<table>
<thead>
<tr>
<th>Target</th>
<th>#%</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. shark</td>
<td>6</td>
<td>[ʃa:k]</td>
<td>[ʃa:k]</td>
<td>[ʃa:k]</td>
<td>1</td>
</tr>
<tr>
<td>2. boat</td>
<td>6</td>
<td>[bo:t]</td>
<td>[bo:t]</td>
<td>[bo:t]</td>
<td>0</td>
</tr>
<tr>
<td>3. rain</td>
<td>6</td>
<td>[re:n]</td>
<td>[re:n]</td>
<td>[re:n]</td>
<td>0</td>
</tr>
<tr>
<td>4. verbena</td>
<td>6</td>
<td>[vərˈbɛnə]</td>
<td>[vərˈbɛnə]</td>
<td>[vərˈbɛnə]</td>
<td>1</td>
</tr>
<tr>
<td>5. birthday cake</td>
<td>6</td>
<td>[bɜˈdeɪ keɪk]</td>
<td>[bɜˈdeɪ keɪk]</td>
<td>[bɜˈdeɪ keɪk]</td>
<td>1</td>
</tr>
<tr>
<td>6. parrot</td>
<td>6</td>
<td>[pærət]</td>
<td>[pærət]</td>
<td>[pærət]</td>
<td>0</td>
</tr>
<tr>
<td>7. jump</td>
<td>6</td>
<td>[dʒʌmp]</td>
<td>[dʒʌmp]</td>
<td>[dʒʌmp]</td>
<td>0</td>
</tr>
<tr>
<td>8. vacuum cleaner</td>
<td>6</td>
<td>[ˈvækjʊlmɪnə]</td>
<td>[ˈvækjʊlmɪnə]</td>
<td>[ˈvækjʊlmɪnə]</td>
<td>1</td>
</tr>
<tr>
<td>9. bridge</td>
<td>6</td>
<td>[bri:dʒ]</td>
<td>[bri:dʒ]</td>
<td>[bri:dʒ]</td>
<td>1</td>
</tr>
<tr>
<td>10. pool</td>
<td>6</td>
<td>[pʊl]</td>
<td>[pʊl]</td>
<td>[pʊl]</td>
<td>0</td>
</tr>
<tr>
<td>11. alpaca</td>
<td>6</td>
<td>[ˈɔːləpəkə]</td>
<td>[ˈɔːləpəkə]</td>
<td>[ˈɔːləpəkə]</td>
<td>0</td>
</tr>
<tr>
<td>12. skipper slide</td>
<td>6</td>
<td>[ˈskɪpəslaid]</td>
<td>[ˈskɪpəslaid]</td>
<td>[ˈskɪpəslaid]</td>
<td>1</td>
</tr>
<tr>
<td>13. tongue</td>
<td>6</td>
<td>[tuŋk]</td>
<td>[tuŋk]</td>
<td>[tuŋk]</td>
<td>1</td>
</tr>
<tr>
<td>14. gumball</td>
<td>6</td>
<td>[ˈɡʌmbɔl]</td>
<td>[ˈɡʌmbɔl]</td>
<td>[ˈɡʌmbɔl]</td>
<td>1</td>
</tr>
<tr>
<td>15. frisbee</td>
<td>6</td>
<td>[ˈfriːzbi]</td>
<td>[ˈfriːzbi]</td>
<td>[ˈfriːzbi]</td>
<td>1</td>
</tr>
<tr>
<td>16. kangaroo</td>
<td>6</td>
<td>[ˈkæŋɡəroʊ]</td>
<td>[ˈkæŋɡəroʊ]</td>
<td>[ˈkæŋɡəroʊ]</td>
<td>1</td>
</tr>
<tr>
<td>17. chips</td>
<td>6</td>
<td>[tʃɪps]</td>
<td>[tʃɪps]</td>
<td>[tʃɪps]</td>
<td>1</td>
</tr>
<tr>
<td>18. wish</td>
<td>6</td>
<td>[wɪʃ]</td>
<td>[wɪʃ]</td>
<td>[wɪʃ]</td>
<td>1</td>
</tr>
<tr>
<td>19. thank you</td>
<td>6</td>
<td>[ˈθæŋk juː]</td>
<td>[ˈθæŋk juː]</td>
<td>[ˈθæŋk juː]</td>
<td>1</td>
</tr>
<tr>
<td>20. which</td>
<td>6</td>
<td>[wɪtʃ]</td>
<td>[wɪtʃ]</td>
<td>[wɪtʃ]</td>
<td>0</td>
</tr>
<tr>
<td>21. why</td>
<td>6</td>
<td>[waɪ]</td>
<td>[waɪ]</td>
<td>[waɪ]</td>
<td>0</td>
</tr>
<tr>
<td>22. helicopter</td>
<td>6</td>
<td>[ˈhɛlkəptər]</td>
<td>[ˈhɛlkəptər]</td>
<td>[ˈhɛlkəptər]</td>
<td>1</td>
</tr>
<tr>
<td>23. underwater</td>
<td>6</td>
<td>[ˈʌnwaːtə]</td>
<td>[ˈʌnwaːtə]</td>
<td>[ˈʌnwaːtə]</td>
<td>1</td>
</tr>
<tr>
<td>24. scissor</td>
<td>6</td>
<td>[ˈskɪzdər]</td>
<td>[ˈskɪzdər]</td>
<td>[ˈskɪzdər]</td>
<td>0</td>
</tr>
<tr>
<td>25. scissors</td>
<td>6</td>
<td>[ˈskɪzdəz]</td>
<td>[ˈskɪzdəz]</td>
<td>[ˈskɪzdəz]</td>
<td>0</td>
</tr>
</tbody>
</table>

Total score 15
Consistency Score 60%
Natalie 6 years 8 months DVD

Interpretation

Natalie presented with inconsistent speech and poor performance on the Oro-motor Assessment. Imitation of both oral movements and isolated speech sounds were difficult for her and accompanied by groping behaviour. Table 5.6 indicates that Natalie’s speech is characterised by changes to syllable structure, a limited range of phonemes, vowel changes and inconsistent use of glottalisation making her speech unintelligible. Her speech and oro-motor difficulties suggest further investigation for developmental verbal dyspraxia is required.

Complimentary Training Video

1 hour overview of the DEAP, presented by Barbara Dodd.

Simply email me your details and I’ll share it with you via Dropbox.

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Download accompanying notes here:
**What the Composites Measure**

- **Phonological Awareness Composite Score (PACS)**
  - 4-6 year olds: Elision, Blending Words and Sound Matching
  - 7-24 year olds: Elision, Blending Words and Phoneme Isolation
  - It measures the awareness and access to the phonological structure of oral language
  - Poor phonological awareness is viewed as a hallmark of reading disability
What the Composites Measure

- **Phonological Memory Composite Score (PMCS)**
  - Memory for Digits and Nonword Repetition for all ages
  - It represents the examinee’s ability to code information phonologically for temporary storage in working or short-term memory
  - A deficit does not necessarily lead to poor reading of familiar material but is more likely to impair decoding of new words
  - A deficit may not impair listening or reading comprehension for simple sentences but is likely to impair both listening and reading comprehension for more complex sentences

- **Rapid Symbolic Naming Composite Score (RSNCS)**
  - 4-24 year olds: Rapid Digit Naming and Rapid Letter Naming

- **Rapid Non-Symbolic Naming Composite Score (RNNCS)**
  - 4-6 year olds: Rapid Color Naming and Rapid Object Naming
  - RSNCS and RNNCS measure abilities in efficient retrieval of phonological information from long-term memory and executing a sequence of operations quickly and repeatedly (required when reader try to decode unfamiliar words)
    - Poor scores indicate problems with reading fluency
Discrepancy Analyses

- Compare test for significant differences
- Make only subtest-to-subtest and composite-to-composite comparisons
- Calculate difference scores
  - Determine whether the difference is statistically significant (follow procedure and use tables to find this) or clinically useful (use tables to determine this)

### Table 3.2
Level of Confidence That Differences Between Composite Scores Are Statistically Significant

<table>
<thead>
<tr>
<th>Level of confidence</th>
<th>PMCS to RSNCs</th>
<th>PMCS to RNNCs</th>
<th>PACS to PMCS</th>
<th>PACS to RNNCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>95%</td>
<td>&gt;13</td>
<td>&gt;11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>12–13</td>
<td>10–11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85%</td>
<td>10–11</td>
<td>8–9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80%</td>
<td>9</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70%</td>
<td>7–8</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not confident</td>
<td>&lt;6</td>
<td>&lt;5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: PMCS = Phonological Memory Composite Score; RSNCs = Rapid Symbolic Naming Composite Score; RNNCs = Rapid Non-Symbolic Naming Composite Score; PACS = Phonological Awareness Composite Score.
Joshua’s scores

• PACS 82 & PMCS 82
• PACS 82 & RSNCS 79
• PMCS 82 & RSNCS 79

• All the differences in the composite scores are 3 points or less.

• Differences are neither statistically significant nor clinically meaningful.
The importance of vocabulary

One of the best predictors of academic success when starting school

1. Strongly related to reading comprehension
2. Correlates highly with general verbal ability
3. Has a direct impact on overall literacy development
**Vocabulary Demands on Students**

- Children arrive in first grade with about 6,000 words
- Only about 400 words a year are directly taught by teachers
- Everyday speech consists of 5,000 to 7,000 words

**A Multi-Module Approach**

- Listening and speaking vocabularies enhance reading and writing vocabularies
- The benefits of particular practice activities cross over from one mode to another
Summary Report Example

Summary Narrative Example

The Psycholexical Picture Vocabulary Test Fourth Edition® (PPVT-4) measure is a test of the receptive (listening) vocabulary of children and adults. The PPVT-4 consists of an individually administered, non-linguistic, oral-language test.

On December 12, 2006, Cemetery Hold was administered the PPVT-4 Form B. The test was held at the time of testing. Age norms were used to score the administration.

Cemetery obtained a PPVT-4 standard score of 105. The chances are about 50% that the range of scores from 100-113 includes her true score. Her percentile rank is 73 percent, which indicates that 73% of children of her age, sex, and ethnicity scored at or below the 73 percentiles of her age. This average equivalence is 10.7. Cemetery’s receptive vocabulary understanding is in the average range.
Analysis Report Example

Classification by Part of Speech

Noun...Verb...Attribute (Adjectives & Adverbs)
Uses of the EVT-2

1) **Screening for Expressive Language Problems**
   ○ Poor vocabulary skills are a valuable indicator of a possible language difficulty

2) **Screening Preschool Children**
   ○ Expressive vocabulary is a vital aspect of early language development

3) **Measuring Word Retrieval**
   ○ Direct comparison between the EVT-2 and PPVT-4 is an excellent way to screen for aphasia and other expressive language impairments in children and adults

4) **Understanding and Assessment of Literacy Skills**
   ○ Measuring an individual’s vocabulary knowledge can contribute greatly to the understanding and assessment of literacy skills

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1. **Monitoring Growth**
   - Wide age range allows for monitoring growth from preschool through to school years and into adulthood

2. **Research**
   - Can be administered repeatedly through use of the Parallel Form B

3. **Evaluating acquisition of English words (as a criterion measure)**
   - Evaluate the individual’s knowledge of standard American English words
1. Scores the test quickly and accurately
2. Displays a Standard Score Graphical Profile
3. Produces an easily understood narrative in reports
4. Generates developmentally appropriate vocabulary intervention exercises
5. Displays progress over time on the Individual Growth Graph
6. Displays a Group Report to follow student progress
7. Provides an Individual Receptive-Expressive Comparison Chart and narrative report
Intervention

1. Listening, speaking, reading, and writing
2. Antonyms and synonyms
3. Categorisation
4. Word parts
5. Rhyming
6. Compounds
7. Onomatopoeia
8. Meaning and usage
9. Storytelling

Therapy planning

Tier 1—Basic Vocabulary

Tier 2—High Frequency/Multiple Meaning Vocabulary

Tier 3—Low-Frequency, Context-Specific Vocabulary
Why The Bridge of Vocabulary?

- Evidence-based therapy resource
- Covers pre-school to adult
- Contains 101 vocabulary instruction, enrichment, and intervention activities in print form
- Contains an additional 300 guided practice activities and Independent Practice Worksheets on CD-ROM, as well as:
  - Picture cards
  - Word cards

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I’m here to help

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