Dysgraphia Assessment

Information to consider prior to recommending an assessment for dysgraphia:

- Normal or average skills/ability:
  - Cognition & memory
  - Oral language
  - Sensory & motor
  - Social/emotional
- Have other factors that could account for the student’s difficulty with writing been ruled out? (e.g., Intellectual disability, Williams Syndrome, Developmental Coordination Disorder, brain injury or disease, etc.)

→ DECISION – is assessment recommended?

If assessment is recommended – the process should occur through the safeguards and procedures in either Section 504 or IDEA (special education)

Assessment

- Review:
  - School Records – history of writing difficulties in early grades (K/1st)
  - Parent information:
    - Is there a history of ongoing and current handwriting problems?
    - Is there a family history of handwriting difficulties?
  - Handwriting samples – different times of the day; different lengths; copying vs. composing; drawings (art)

- During assessment, observe & describe the following characteristics of the student’s handwriting:
  - Handedness
  - Pencil Grip
  - Paper Position
  - Posture

Handwriting Achievement (to include rate and legibility):
  - Alphabet Task (compare oral & written)
  - Copying Task
  - Composition
  - Spelling
  - Keyboarding (optional)
- **Alphabet Task** - timed (measure of orthographic loop):
  Measures – orthographic-motor integration; motor planning and execution
  (requires the child to **retrieve from memory and produce alphabet letters in sequence**, integrating orthographic symbols and motor output – **orthographic loop**; long-term and working memory are involved)

**Directions:**

- **Materials:** pencil without an eraser and paper lined appropriate to grade level.
- **Instructions:**

  *The pencil you will use does not have an eraser. Whenever you want to make a correction, cross out and write the change above or below what you want to correct. With this pencil write the entire alphabet in order in lower-case, manuscript letters. Make sure you print and do not use cursive handwriting. [Once in a while I will make a red mark on your paper. Do not pay any attention to this. Keep going.] Work as quickly as you can without making mistakes. Remember to print in lower-case, not capital, letters. Ready? Go.* (Start stopwatch. Note what letter the child has written at 15 seconds. Record total time.)

<table>
<thead>
<tr>
<th>Task: Alphabet (15 sec.)</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average [M (SD)]</td>
<td>4.6 (2.6)</td>
<td>6.8 (4.1)</td>
<td>8.7 (5.8)</td>
</tr>
<tr>
<td>Below Average</td>
<td>1.3</td>
<td>2.4</td>
<td>3.9</td>
</tr>
</tbody>
</table>

- **Handwriting rate - copying a sentence containing all alphabet letters:** (timed)

  [This task is a visual-motor copying task that requires fewer cognitive demands because a model of each word is provided; Short-term and working memory are involved]

  - Ask the student to copy a sentence that has most of the letters of the alphabet (see below). Have the student practice writing the sentence one time, and then ask the student to copy the sentence as quickly as possible in 3 minutes. Count the total number of letters the student has written in the 3-minute period and divide this number by 3 to get the total letters per minute (lpm).
    - *The quick brown fox jumped over the lazy dogs.*
    - *The five boxing wizards jump quickly.*
    - *Few black taxis drive up major roads on quiet hazy nights.*

  - Compare the student’s proficiency to the following scale:

    | Grade 1: 25 lpm | Grade 2: 30 lpm | Grade 3: 38 lpm | Grade 4: 45 lpm |
    | Grade 5: 60 lpm | Grade 6: 67 lpm | Grade 7: 74 lpm |
- **Composition:**
  - To assess composition, you can have the student write about a topic they are interested in or something they are looking forward to; you could also use an unedited writing sample completed in class. Time the student for approximately 10 minutes (this also includes time for planning).
  - Use the 6+1 Trait Rubrics for scoring [http://educationnorthwest.org/trait](http://educationnorthwest.org/trait)
  - The student’s composition can be used to assess legibility (see below)

**Handwriting Legibility:**
Legibility can be assessed from either an unedited student work sample or from the student’s work on the composition measure. Score each category as either 1 (no difficulties observed based on questions for each category) or 0 (one or more difficulties observed based on questions for each category):

1. Letter Formations, Size, & Proportion:
   a. Are letters recognizable out of context?
   b. Are letters consistently formed?
   c. Are there large fluctuations in the size of the letters?
   d. Are letters proportional to each other and to case?
   e. Are letters capitalized appropriately?

2. Spacing and Alignment:
   a. Is there crowding of words, letters, or lines?
   b. Are lines of text reasonably straight?
   c. Are margins relatively balanced?

3. Line Quality:
   a. Is there uneven pressure?
   b. Is there pressure that is too heavy?
   c. Is there pressure that is too light?

4. Slant – Is the slant generally consistent?

5. General Appearance:
   a. Are there excessive erasures or strikeovers (messy)?
   b. Is the writing too small for reading?
   c. Is the writing too large for reading?

**Overall Scoring (Quality):**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<tbody>
<tr>
<td>0-1</td>
<td>Very Poor</td>
</tr>
<tr>
<td>2</td>
<td>Poor</td>
</tr>
<tr>
<td>3</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

- **Spelling**
  - Spelling of single words in isolation (compare oral spelling to written spelling):
    - Informal - *Words Their Way Developmental Spelling Inventory*
    - Formal - Various achievement tests include a measure of spelling
  - Analyze spelling errors – phonology, orthography, morphology
  - Measure of word choice (ability to identify correctly spelled words in the absence of graphomotor skills):
    - *Test of Orthographic Competence* – Word Choice
    - PAL-III – Word Choice

→ **DECISION:**
  - Does the student exhibit difficulty in any of the above skills? (if formal measures used, look at a scaled score below 8 or the 25th percentile)
  - If the answer is ‘YES’, then assess cognitive processes related to handwriting.

**Cognitive Processes related to handwriting:**

**Finger Succession Task:**
[Measures – planning and programming of complex fine-motor movements]

**Directions:**
*Please hold your hands up just like I am.* (Hold up both hands out of peripheral vision. Demonstrate for right hand first.) **First, watch what I do.** (Touch each finger with thumb working in succession: always little finger to ring to middle to index finger; repeat cycle twice.) **Now do it with me. Now try it on your own.** (Practice until the child gets the idea. Note if more than three sequences are needed.) **When I say ‘go’, touch your fingers together just like I did as quickly as possible using this hand** (Point - dominant hand.) **Keep doing it until I tell you to stop. Ready? Go.** (Tell child to stop after five successions.) Performance (completion of 5 successions or 20 touches) was timed by hand-held stopwatch (to nearest second) and commenced when the examiner pronounced the word, ‘go’

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>LF*</td>
</tr>
<tr>
<td>Finger Succession (Dominant Hand)</td>
<td>15.9</td>
<td>21</td>
<td>24.3</td>
</tr>
</tbody>
</table>

*LF = Low Functioning (SD and LF are above M because higher scores reflect poorer performance)*
Orthographic Coding
- Informal:
  - Building Blocks Questionnaire (Adapted)
  - Spelling
- Formal: PAL-II Receptive Coding; Symbol Imagery Test

Rapid Naming
[Rapid Naming assesses the phonological and orthographic codes in word spelling (Berninger, 2009)]
- Various tests include a measure of rapid naming

Phonological Awareness:
- Based on the student’s results on RAN and/or spelling, there may be a need to assess phonological coding.

→ DECISION:
- Does the student exhibit difficulty in any of the above processes? (if formal measures used, look at a score below the 25th percentile)
- If the answer is ‘YES’, then consider a diagnosis of dysgraphia.

According to Berninger (2009, p. 75), the hallmark features of dysgraphia include:
- Impaired orthographic coding, and/or graphomotor planning for sequential finger movements (together these function as the orthographic loop)
- “The transcription skill that explains unique variance in the handwriting, fluency, and quality of composing of children with dysgraphia, whose motor development falls within the normal range, is automatic retrieval and production of legible letters.”

References
