Assessment in the Digital Age: What is Appropriate Clinical Practice?

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Disclosure

- Financial disclosures:
  - Dr. Adam Scheller is employed by Pearson Clinical Assessment, publisher of the CELF-5, PPVT-2, EVT-2, PLS-5, GFTA-2, and Q-interactive. No other language assessments or systems will be presented in this session.

- Non-financial disclosure:
  - There are no non-financial relationships to disclose.

Learner Outcomes

After the completion of the webinar, attendees will be able to:

1. Describe the results of at least one research study conducted with assessments delivered digitally.
2. Name at least one advantage to administering an assessment on a computer or tablet vs. on paper.
3. Name at least one disadvantage to administering an assessment on a computer or tablet vs. on paper.
4. Name at least two factors that influence test results delivered via telepractice that are different from a fact-to-face assessment delivered on a computer.

Adopting Technology

- The first commercially available computer was released in 1951.
  - By 2010, about 77% of households had a computer.
- In 2010, Apple announces the first iPad and starts the tablet PC race.
  - By 2012, 30% of internet users access the internet from a tablet PC.
  - By 2011, over 10% of households have a tablet PC.

Wearable tech?
History of Technology in Speech and Language

- Sound Level Meters
  - Voice
- Audiometers
  - Hearing
- Delayed Auditory Feedback Device
  - Stuttering
- Augmentative Devices
  - Non-verbal Communication
  - 1950s: systems for people who lost the ability to speak following surgical procedures

- What about for assessment?

ASHA Scope of Practice (2007)

- Speech-language pathology is dynamic and continuously developing
- Provide additional professional services necessary for the well-being of the individual(s) they are serving.
- Ethical and legal obligation to determine whether if they can and should perform such services.
- Clinical services include: prevention and pre-referral; screening*; assessment/evaluation*; consultation; diagnosis*; treatment, intervention*; management; counseling; collaboration; documentation*; referral

Scope of Practice: Clinical Services (cont.)

- Examples related to digital assessment include:
  - "using data to guide clinical decision making..."
  - "making service delivery decisions..."
  - "documenting provision of services..."
  - "providing intervention and support services..."

- "...staying up-to-date is important to keep engagement and motivation high for the students you are working with..."
- "Exposing students to new and different technologies...will help children adapt to...technology."

(ASHA, 2007)
Assessment via Telepractice

- Specific issues in the delivery of assessment via telepractice include, but are not limited to:
  1. Examinee age and characteristics
  2. Examiner characteristics
  3. Format of the assessment task
  4. Appropriate modifications of tasks (CELF C&FD)
  5. The use of norm-referenced scores validated on a paper
  6. Equivalency among paper-based, digital, and telepractice assessment processes
  7. The legal requirements for use of published test content

Some Findings Related to Telepractice Assessment

1. Audio/connectivity issues
2. Assessment online was very similar to in-person assessment
3. Stimulus books online is good, but it can be challenging to open the instructions separately
4. Using the computer seems to help students focus and stay motivated
5. Kids need to have good mouse use skills to point
6. Inability to see the child’s mouth (inside)

Ethical/Legal Considerations

HIPAA Security Rule

- Electronic records, like paper records, should be created and maintained in a way that is designed to protect their security, integrity, confidentiality, and appropriate access, as well as their compliance with applicable legal and ethical requirements.
Ethics and Records (ASHA, 2013)

- “ASHA members have a responsibility not only for monitoring their own conversations, securing of records, and sharing of client information.”
- “Appropriate steps must be taken to ensure the confidentiality and protection of electronic and computerized client records and information.”

Benefits of Digital Assessment

- Portability and less materials
- Access tests quickly
- Customize batteries
- Flexibility
- Focus on client/student
- Time savings and increase accuracy
- Increased security of records?

Considerations...disadvantages?

- Cost structure is different.
- Digital Security
- Are we measuring the same constructs?
- How do results look for kids with disabilities?
- Digital snafus
- Any others?

Psychometric Studies
Take Into Consideration That Digital Admin May Affect Test Scores...

1. Examinee interaction with the tablet.
2. Examiner interaction with the tablet, especially during response capture and scoring.
3. Q-interactive system scoring the examinee’s touch responses accurately.

Development and Design
Two primary steps in current development process

1. Design tests in a way that minimizes digital effects
   - Group tests based on common features
   - Identify how particular features might impact raw scores
   - Develop interfaces for each ‘group’ that minimize those impacts

2. Conduct studies to establish raw score equivalency between paper and digital versions
   - Verify that goals in Step 1 are being realized
   - Allow for use of pre-existing norms, as well as reliability and validity information

Equivalency Studies
Process

- Develop efficient study designs
- Set a standard for equivalence:
  - Effect size < .20
- Extensive training of examiners
- Video recording of data collection
- Investigations of any observed format effects

WAIS-IV & WISC-IV

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Comprehension</td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
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<tr>
<td>Vocabulary</td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
</tr>
<tr>
<td>Word Reasoning</td>
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<tr>
<td>Perceptual Reasoning</td>
<td></td>
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<tr>
<td>Block Design</td>
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<tr>
<td>Matrix Reasoning</td>
<td></td>
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<tr>
<td>Visual Puzzles</td>
<td></td>
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<tr>
<td>Figure Weights</td>
<td></td>
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<tr>
<td>Picture Comparison</td>
<td></td>
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<tr>
<td>Picture Concepts</td>
<td></td>
</tr>
<tr>
<td>Working Memory</td>
<td></td>
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<tr>
<td>Arithmetic</td>
<td></td>
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<tr>
<td>Digit Span</td>
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<tr>
<td>Letter Number Sequencing</td>
<td></td>
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<tr>
<td>Processing Speed</td>
<td></td>
</tr>
<tr>
<td>Coding</td>
<td></td>
</tr>
<tr>
<td>Symbol Search</td>
<td></td>
</tr>
<tr>
<td>Cancellation</td>
<td></td>
</tr>
</tbody>
</table>
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### CELF-5 Equivalence Study: Method

- Four CELF-5 tests were identified for study:
  - Linguistic Concepts
  - Recalling Sentences
  - Following Directions
  - Formulated Sentences

### CELF-5 Equivalence Study: Method

1. Test-retest design.
2. Every examinee will take the same sequence of subtests.
3. 20 demographically-matched pairs of examinees.
4. Video-recorded to analyze nonequivalence.
5. Video camera will keep rolling for a total of 15 min. between the two administrations.
6. Examiner training.
7. No examinee may participate in more than one of the two studies.
**CELF-5 Study Findings**

<table>
<thead>
<tr>
<th>Test</th>
<th>Mean Digital-Paper</th>
<th>SD Digital-Paper</th>
<th>Mean Paper</th>
<th>SD Paper</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic Concepts</td>
<td>10.23</td>
<td>2.92</td>
<td>10.34</td>
<td>3.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Recalling Sentences</td>
<td>11.35</td>
<td>2.89</td>
<td>12.47</td>
<td>3.65</td>
<td>0.18</td>
</tr>
<tr>
<td>Following Directions</td>
<td>10.00</td>
<td>2.81</td>
<td>10.11</td>
<td>2.81</td>
<td>0.00</td>
</tr>
<tr>
<td>Formulated Sentences</td>
<td>11.22</td>
<td>4.14</td>
<td>11.17</td>
<td>3.73</td>
<td>0.06</td>
</tr>
</tbody>
</table>

**Other S/L Tests**

- **PPVT:**
  - Didn't/won't have an equivalency study
- **GFTA-2:**
  - Will not have an equivalency study either

**Digital Assessment Options**

- **Q-global**
- **Q-interactive**

**What is Q-global?**

1. Web-based system that consolidates content and functionality from: Q-Local™, PsychCorp Center, and ASSIST™.
2. On-screen administration of assessments
   - Assessments that do not require interaction between the clinician and client.
3. Scoring and reporting capabilities
   - A complete set of options for scoring, interpreting, and reporting assessment results.
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**Q-interactive**

Digital platform for individually-administered tests

**CENTRAL:**

Browser-based function for generating client profiles, building test batteries, creating assessment sessions, and sharing results.

**ASSESS:**

Application that lets an examiner administer a test via two tablets connected by Bluetooth.

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**Central: Custom Batteries at Your Fingertips**

- **CELF-5 Ages 9-21**
  - CELF-5 Ages 9-21: Verbal Comprehension
  - CELF-5 Ages 9-21: Language Production
  - CELF-5 Ages 9-21: Word Finding
  - CELF-5 Ages 9-21: Sentence Comprehension
  - CELF-5 Ages 9-21: Reading Comprehension
  - CELF-5 Ages 9-21: Oral Expression

- **Your custom battery (you can render these items in the next step)**

**Total Time: 60 mins**

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**Q-interactive: Components of Assess**

Practitioner

Client

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**Assess: Instant scores!**

- Proprietary analysis displayed
- Test results summarized
- Unique profiles
- Advanced reporting

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Features of Q-interactive

- Familiarity / consistency built-in to overall design
- Administration Guidance
- Alert messages
- Timer
- Easy-to-use event buttons
- Observational notes / audio recording
- Automated exposure time and scoring on many subtests

What Materials/Equipment will I need?
Do I need Web Access?

Traditional Print Edition
Materials/Equipment needed
Printed Manuals and Forms
Web Access needed?
No

What Materials/Equipment will I need?
Do I need Web Access?

CD-ROM
Materials/Equipment needed
CD-ROM Computer with CD-ROM player
Web Access needed?
No

What Materials/Equipment will I need?
Do I need Web Access?

Flash Drive Kit
Materials/Equipment needed
Flash drive, computer or tablet with USB port
Web Access needed?
No

*not available for Surface RT
What Materials/Equipment will I need? Do I need Web Access?

<table>
<thead>
<tr>
<th>Materials/Equipment needed</th>
<th>Web Access needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q-global®</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Computer: iPad or tablet with or without USB port; printed record forms

What Materials/Equipment will I need? Do I need Web Access?

<table>
<thead>
<tr>
<th>Materials/Equipment needed</th>
<th>Web Access needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two iPads; (some paper forms required)</td>
<td>Yes to download tests No to administer/score tests</td>
</tr>
</tbody>
</table>

Decision Making for CELF-5:
If you use a desk/laptop computer with USB port

- USB-accessible Administration
  - unlimited use
  - no web access needed
  - accessible on any device with a USB port

*Not available for Surface RT*

Decision Making for CELF-5:
If you access to iPads and the web...

<table>
<thead>
<tr>
<th>Web-based administration, scoring &amp; reporting</th>
<th>Web-based administration &amp; scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>- unlimited use of digital manuals and stimulus books</td>
<td></td>
</tr>
<tr>
<td>- no need to carry the flash drive with you</td>
<td></td>
</tr>
<tr>
<td>- automated scoring (pay-per-use or subscription)</td>
<td></td>
</tr>
<tr>
<td>- accessible on any computer or tablet (including iPad)</td>
<td></td>
</tr>
</tbody>
</table>

- flexible, guided administration including automatic start point, basal, and ceiling notifications
- real-time capture of examinee's responses (including audio recordings)
- real-time, accurate scoring
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**CELF-5 Q-interactive**

**Administration and Scoring Assistance**

**Scoring PP example**
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**CELF-5 Q-global**

**Decision Making for PPVT-4 & EVT-2:**
If you use a desk/laptop computer with USB, do you have internet access?
Decision Making for PPVT-4 & EVT-2:
If you have access to iPads

Option 1 (Requires one iPad)
- Web-based administration & scoring
  - Administrator
  - Digital test stimuli and Record Forms
  - Score
  - Automated scoring

Option 2 (Requires one iPad)
- Web-based administration, scoring, & reporting
  - Administrator
  - PPVT-4 or EVT-2 by web-based digital Stimulus Book (and paper Record Forms)
  - Score and report
  - Scores online, entering either item scores or raw scores from paper Record Forms

PPVT-4 Q-global

Decision Making for GFTA-2:
If you use a desk/laptop computer with a USB port

USB-accessible Administration

Purchase
- Paper GFTA-2 Manual
- Paper GFTA-2 Record Forms
- USB drive that includes the Digital Stimulus Book

Administer
GFTA-2 by inserting the flash drive in the USB port. Print the Administration Directions on the flash drive. Open the Digital Stimulus Book to display the GFTA-2 picture stimuli to the child. Record the child’s responses on a paper GFTA-2 Record Form.

More compatible with Author diet
Decision Making for GFTA-2:
If you use a computer with a CD-ROM drive

- Scoring and Reporting
  - Purchase
    - GFTA-2 iPad™ 2 ASSIST software (Windows only)
  - Scoring and reporting
    - Enter raw scores or re-scores from GFTA-2 paper Record Forms to generate a report.

Decision Making for GFTA-2:
If you have access to 2 iPads

- Web-based Administration & Scoring
  - Purchase
    - Annual license
    - Pay per use administration/scoring combined
  - Administrator
    - GFTA-2 on two iPads—one for the examiner to use the test content and one for you to capture the examinee’s responses.
  - Score
    - Automated scoring includes two standard scores for Sounds in Words and raw scores for Sounds in Sentences when you complete testing. View a full error analysis of each phoneme (item scores, phonetic transcription, and phonetic transcription) automatically in Q-Central when you complete testing.

Error Analysis – GFTA-2

- Table showing error analysis with columns for different phoneme types and rows for different items.

Decision Making for the PLS-5:
If you use a desk/laptop computer with a USB port

- USB-accessible Administration
  - Purchase
    - PLS-5 flash drive that includes the Digital Stimulus Book
    - Paper PLS-5 Administration and Scoring Manual
    - Paper PLS-5 Examiner’s Manual
    - Paper PLS-5 Record Forms
  - Administrator
    - Administer PLS-5 by inserting the flash drive in the USB port. Open the Digital Stimulus Book to display the PLS-5 picture stimuli to the child.
    - Record the child’s responses on a paper PLS-5 Record Form.

*Not compatible with tablets or iPads.*
How to choose...how to chose?

- What tech do you have?
- Do you have internet access?
- Are you doing telepractice?
- Do you need portability?
- Do you need something to just score/report assessments, or are you looking for something more integrated?