Understanding Psychological Evaluation Reports

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Review of Presentation

• Review of test development and administration
• Different types of evaluations
• Common instruments used in psychological evaluations
• Bell curve and brief statistics review
• How evaluations can be useful
  – How test scores relate to functional deficits
    • E.g. mild intellectual disability
• Limitations of these measures
• Case examples
• What helps individuals to be successful despite areas of weakness?
• Success includes more than intelligence
• Resources
Psychological Tests and Measurement

• It is important for clinicians to use well developed tests. Key components to a “good” test include:
  – Diverse and Representative Normative Sample
  – Measurement error
  – Strong reliability
  – Good validity
• Appropriate selection of measures, well-informed interpretation of scores
• Standardized administration
• Note: it is fairly common for healthy individuals to show isolated weaknesses in one test or area.

Slick (2006)

Psychological Tests and Measurement

• Professionals who administer and interpret psychological measures include graduate education and training in many areas, including (but not inclusive)
  – Psychometric and measurement knowledge
  – Statistics and measurement error
  – Selection of appropriate tests
  – Test administration procedures
  – Ethnic, racial, cultural, gender, age, and linguistic variables
• Published guidelines from the American Psychological Association (APA) can be found online at http://www.apa.org/science/programs/testing/qualifications.pdf
### Different Types of Evaluations

<table>
<thead>
<tr>
<th>Reason to Refer</th>
<th>Psychological Evaluations</th>
<th>Psycho-educational Evaluations</th>
<th>Neuropsychological Evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern about psychological functioning (e.g. emotional or behavioral functioning)</td>
<td>Concern about overall cognitive functioning or academic deficits. More often used without history of medical or neurological conditions</td>
<td>Concerns about cognitive skills. More often have history of medical or neurological condition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who conducts them</th>
<th>Psychological Evaluations</th>
<th>Psycho-educational Evaluations</th>
<th>Neuropsychological Evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>In outpatient settings, overseen by psychologist. In school settings, typically performed by master's level school psychologists</td>
<td>In outpatient settings, overseen by psychologist. In school settings, typically performed by master's level school psychologists</td>
<td>Neuropsychologist (psychologist who completed 2-year fellowship in neuropsychology)</td>
<td></td>
</tr>
</tbody>
</table>

### Different Types of Evaluations

<table>
<thead>
<tr>
<th>Types of measures given</th>
<th>Psychological Evaluations</th>
<th>Psycho-educational Evaluations</th>
<th>Neuropsychological Evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive ability (IQ test); personality and emotional functioning. May include measures of academic skills, behavior, and adaptive functioning</td>
<td>Cognitive ability (IQ test) and academic skills. May include personality/emotional adjustment and/or behavior.</td>
<td>Measures typically administered in other evaluations plus: learning and memory, executive functioning, motor and sensorimotor, visual perceptual skills, attention, language processing, and social perception.</td>
<td></td>
</tr>
</tbody>
</table>
Common Instruments Used

• Intelligence
  – Wechsler scales
    • Wechsler Adult Intelligence Scale-Fourth Edition (WAIS-IV)
    • Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V)
  – Stanford-Binet Intelligence Scales-Fifth Edition (SB5)

• Achievement
  – Wide Range Achievement Test-Fourth Edition (WRAT-4)
  – Wechsler Individual Achievement Test-Third Edition (WIAT-III)

Common Instruments Used

• Mood and Behavior
  – Beck Depression Inventory-Second Edition (BDI-II)
  – Beck Anxiety Inventory (BAI)
  – Behavior Assessment System for Children-Third Edition (BASC-3, norms available through age 21)
  – Behavior Rating Inventory of Executive Function-Adult Version (BRIEF-A)

• Personality
  – Minnesota Multiphasic Personality Inventory-Second Edition (MMPI-2)
  – Personality Assessment Inventory (PAI)
Common Instruments Used

• Adaptive Functioning
  – Adaptive Behavior Assessment System-Second Edition (ABAS-II)

• Symptom and Performance validity
  – Test of Memory Malingering (TOMM)
  – Word Memory Test (WMT)
  – Embedded measures

Sample Statistics

<table>
<thead>
<tr>
<th></th>
<th>Standard Score</th>
<th>Scaled Score</th>
<th>T-Score</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (M) and Standard Deviation (SD)</td>
<td>M = 100, SD = 15</td>
<td>M = 10, SD = 3</td>
<td>M = 50, SD = 10</td>
<td>-</td>
</tr>
<tr>
<td>CLASSIFICATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Superior</td>
<td>130 and above</td>
<td>16 and above</td>
<td>70 and above</td>
<td>98th and above</td>
</tr>
<tr>
<td>Superior</td>
<td>120-129</td>
<td>13-14</td>
<td>64 to 69</td>
<td>92nd – 97th</td>
</tr>
<tr>
<td>High Average</td>
<td>110-119</td>
<td>12-13</td>
<td>58-63</td>
<td>77th – 91st</td>
</tr>
<tr>
<td>Average</td>
<td>90-109</td>
<td>8-11</td>
<td>43-57</td>
<td>25th -75th</td>
</tr>
<tr>
<td>Low Average</td>
<td>80-89</td>
<td>6-7</td>
<td>37-42</td>
<td>9th – 23rd</td>
</tr>
<tr>
<td>Below Average/Borderline</td>
<td>70-79</td>
<td>4-5</td>
<td>30-35</td>
<td>3rd – 8th</td>
</tr>
<tr>
<td>Extremely Low</td>
<td>Below 70</td>
<td>3 and below</td>
<td>29 and below</td>
<td>2nd and below</td>
</tr>
</tbody>
</table>
Factors other than ability that may influence testing performance

- Physical variables (e.g. pain, sleep/fatigue)
- Psychological variables (e.g. depression and anxiety)
- Psychosocial variables
- Motivation
How psychological evaluations can be useful

• Identify factors that impact vocational goals and employability
  – Cognitive factors
    • Language deficits
    • Slow processing speed
    • Inattention
    • Executive dysfunction
    • Impaired fine motor skills
    • Learning disability
  – Psychiatric Factors
    • Depression
    • Anxiety
    • Behavioral dysregulation

How psychological evaluations can be useful

• Identify factors that impact vocational goals and employability
  – Adaptive Functioning
    • Similar cognitive profiles may be functioning very differently in daily life
  – Motivation
    • Seek help from others
    • Strong work ethic
    • Approach to evaluation
How psychological evaluations can be useful

• Test scores help identify functional deficits
  – Several studies support that neurocognitive factors are related to functioning in daily life:
    • Intellectual abilities, visual memory, verbal learning, cognitive flexibility, and behavioral ratings of attention span and frustration tolerance were associated with successful completion of instrumental activities of daily living (IADL) tasks (e.g., taking medication, managing money) in individuals in a post-acute brain injury rehabilitation program (Farmer & Eakman, 1995)

How psychological evaluations can be useful

– Several studies support that neurocognitive factors are related to functioning in daily life:
  • Measures of executive functioning may predict academic achievement and behavior in the workplace (i.e., number of hours worked, number of promotions received) (Ready, Steirman, & Paulsen, 2001)
  • Measures of executive functioning were stronger predictors of IADLs than other neuropsychological measures, mood factors, or demographic factors (Cahn-Weiner et al., 2000)
Example of utility of psychological evaluations

- Intellectual Disability
  - Onset during the developmental period
  - A. Deficits in intellectual functions, confirmed by clinical assessment and individualized, standardized testing
  - B. Deficits in adaptive functioning
  - C. Onset during the developmental period
- Specify current severity (Mild, Moderate, Severe, Profound)
- Defined on the basis of adaptive functioning because it determines the level of supports required

### DSM-V Mild Intellectual Disability

<table>
<thead>
<tr>
<th>Conceptual Domain</th>
<th>Social Domain</th>
<th>Practical Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems learning academic skills in school-aged individuals</td>
<td>Immature in social interactions</td>
<td>Personal care may be age-appropriate</td>
</tr>
<tr>
<td>Weaknesses in abstract thinking</td>
<td>Problems accurately perceiving social cues</td>
<td>Need more support in complex daily living tasks</td>
</tr>
<tr>
<td>Concrete approach to problem solving</td>
<td>Concrete or immature language/conversation</td>
<td>E.g., grocery shopping, transportation, managing finances</td>
</tr>
<tr>
<td>Executive Functioning deficits</td>
<td>Problems regulating emotions/behaviors in social situations</td>
<td>May require support to make health and legal decisions</td>
</tr>
<tr>
<td>E.g., planning, approach to tasks, flexibility</td>
<td>Limited understanding of risks in social situations</td>
<td>Typically need support in skilled vocation</td>
</tr>
<tr>
<td>Poor functional academic skills</td>
<td>Poor judgment</td>
<td>Less likely to do well in a job that requires conceptual skills</td>
</tr>
<tr>
<td>E.g., problems managing finances</td>
<td>Risk of being manipulated</td>
<td></td>
</tr>
</tbody>
</table>

Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition (DSM-V)
Limitations of test measures

- Samples not always representative of patient population referred for neuropsychological evaluation
- Significant but moderate correlations. Neurocognitive factors account for 20-50% of variance in measures of everyday ability
- Many studies rely on collateral reports of functioning
- Confounding factors
  - Multiple aspects must be considered (e.g., emotional functioning, motor problems, physical health)
  - Individual has good compensatory strategies

Limitations of test measures

- Neuropsychological tests do not always translate to functioning in daily life (i.e., poor ecological validity of some measures).
  - Neuropsychological measures may be helpful for identifying at risk drivers (i.e., poor visual-spatial skills), but an on-road test is the gold standard of driving function (Reger et al., 2004)
  - Studies regarding measures of executive functioning are mixed (Chaytor, Schmitter-Edgecombea, & Burr, 2006).
    - A measure of response inhibition was positively correlated with informant ratings of executive functioning and adaptive behavior in daily life.
    - A measure of switching was only correlated with informant ratings of adaptive functioning.
    - Other measures of executive functioning (verbal fluency, nonverbal problem solving) were not correlated with informant ratings.
Limitations of test measures

• Due to limitations of our measures, it is essential to gather additional data regarding functional performance
  – Rating scales of functional abilities through self-report or caregiver report
    • Adaptive Behavior Assessment System (ABAS)
  – Collateral interviews
    • Spouse/family members, teachers, employers, counselors
    • Gain insight into functioning in daily life

Case Example 1

• 20-year-old, right-handed male
• History of moderate TBI following car accident
• Inpatient rehabilitation
• Presenting concerns:
  – Easily frustrated and upset
  – Problems inhibiting his behavior and comments in social situations
  – Problems with peer relationships and job performance
Case Example 1

<table>
<thead>
<tr>
<th>Domain</th>
<th>Standard Score</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Wechsler Adult Intelligence Scale (WAIS) | Full Scale IQ: 102  
Verbal Comprehension Index: 95  
Perceptual Reasoning Index: 109  
Working Memory Index: 97  
Processing Speed Index: 108 | Average  
Average  
Average  
Average  
Average |
| **Academic Functioning**    |                                                                                 |                |
| Woodcock Johnson Tests of Achievement (WJ Ach) | Broad Reading: 103  
Broad Math: 99  
Broad Written Expression: 95 | Average  
Average  
Average |
| **Learning and Memory**     |                                                                                 |                |
| Wechsler Memory Scale (WMS) | Logical Memory Immediate: 8  
Logical Memory Delayed: 8  
Designs Immediate: 9  
Designs Delayed: 10 | Average  
Average  
Average  
Average |
| **Executive Functioning**  |                                                                                 |                |
| Tower of London             | Total Moves: 72                                                                 | Below Average  |
| **Behavior Rating Inventory of Executive Function (BRIEF)** | Parent and Self Report: Elevated Inhibit, Emotional Control, Self-Monitor scales | Clinically Significant |

*Scaled score

**Case Example 1**

- **Strengths**: Cognitive functioning within normal limits for age in most areas.

- **Limitations**: Weakness on a measure of executive function. Emotional and behavioral dysregulation causing problems with relationships and functioning at work.
Case Example 2

- 17-year-old, right-handed female
- History of brain tumor treated with chemotherapy and radiation
- Presenting concerns:
  - Having trouble completing activities as quickly as in the past
  - Decline in school performance

<table>
<thead>
<tr>
<th>Domain</th>
<th>Standard Score</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wechsler Adult Intelligence</td>
<td>Full Scale IQ: 81</td>
<td>Low Average</td>
</tr>
<tr>
<td>Scale (WAIS)</td>
<td>Verbal Comprehension Index: 110</td>
<td>High Average</td>
</tr>
<tr>
<td></td>
<td>Perceptual Reasoning Index: 85</td>
<td>Low Average</td>
</tr>
<tr>
<td></td>
<td>Working Memory Index: 90</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Processing Speed Index: 66</td>
<td>Extremely Low</td>
</tr>
<tr>
<td><strong>Academic Functioning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodcock Johnson Tests of</td>
<td>Broad Reading*: 80</td>
<td>Low Average</td>
</tr>
<tr>
<td>Achievement (WJ Ach)</td>
<td>Broad Math*: 92</td>
<td>Low Average</td>
</tr>
<tr>
<td></td>
<td>Broad Written Expression*: 85</td>
<td>Low Average</td>
</tr>
<tr>
<td><strong>Fine Motor Skills</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grooved Pegboard</td>
<td>Dominant Hand: 41</td>
<td>Extremely Low</td>
</tr>
<tr>
<td></td>
<td>Nondominant Hand: 63</td>
<td>Extremely Low</td>
</tr>
<tr>
<td><strong>Informant Ratings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptive Behavior Rating</td>
<td>General Adaptive Composite: 72</td>
<td>Below Average</td>
</tr>
<tr>
<td>System (ABAS)</td>
<td>Conceptual: 85</td>
<td>Low Average</td>
</tr>
<tr>
<td></td>
<td>Social: 92</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Practical: 62</td>
<td>Extremely Low</td>
</tr>
</tbody>
</table>

*Index includes academic fluencies
Case Example 2

- **Strengths:** Many aspects of cognitive functioning are intact. No problems identified with emotional, behavioral, or social functioning.

- **Limitations:** Weak processing speed and fine motor skills, which are likely impacting academic and adaptive functioning.

Case Example 3

- 23-year-old, right-handed female
- History of special education services
- Presenting concerns:
  - Help understanding current cognitive function to help with vocational placement
## Case Example 3

<table>
<thead>
<tr>
<th>Domain</th>
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<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Wechsler Adult Intelligence Scale (WAIS) | Full Scale IQ: 66  
Verbal Comprehension Index: 65  
Perceptual Reasoning Index: 60  
Working Memory Index: 55  
Processing Speed Index: 70 | Extremely Low  
Extremely Low  
Extremely Low  
Extremely Low  
Below Average |
| **Academic Functioning**        |                                                                                |                     |
| Woodcock Johnson Tests of Achievement (WJ Ach) | Broad Reading: 50  
Broad Math: 55  
Broad Written Expression: 60 | Extremely Low  
Extremely Low  
Extremely Low |
| **Learning and Memory**         |                                                                                |                     |
| Wechsler Memory Scale (WMS) *   | Logical Memory Immediate: 3  
Logical Memory Delayed: 3  
Designs Immediate: 2  
Designs Delayed: 3 | Extremely Low  
Extremely Low  
Extremely Low  
Extremely Low |
| **Executive Functioning**       |                                                                                |                     |
| Tower of London                 | Total Moves: 64                                                                | Extremely Low       |
| **Informant Ratings**           |                                                                                |                     |
| Adaptive Behavior Rating System (ABAS) | General Adaptive Composite: 58  
Conceptual: 57  
Social: 91  
Practical: 43 | Extremely Low  
Extremely Low  
Average  
Extremely Low |

### Case Example 3

- **Strengths:** Social skills, no emotional or behavioral concerns

- **Limitations:** Overall intellectual abilities, will likely have weaknesses in learning, problem solving, executive functions, and functional academic skills
Case Example 4

• 16-year-old male
• History of two concussions
• Presenting concerns:
  – Poor sleep
  – Memory concerns (can’t remember information for tests at school)
  – Family is concerned about poor self-esteem

<table>
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<tr>
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<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Wechsler Adult Intelligence Scale (WAIS) | Full Scale IQ: 103  
Verbal Comprehension Index: 106  
Perceptual Reasoning Index: 115  
Working Memory Index: 88  
Processing Speed Index: 100 | Average  
High Average |                             |
| **Academic Functioning**      |                                                     |                             |
| Woodcock Johnson Tests of Achievement (WJ Ach) | Broad Reading: 112  
Broad Math: 105  
Broad Written Expression: 110 | High Average  
Average  
High Average |                             |
| **Learning and Memory**       |                                                     |                             |
| Wechsler Memory Scale (WMS) * | Logical Memory Immediate: 12  
Logical Memory Delayed: 13  
Designs Immediate: 11  
Designs Delayed: 10 | Average  
Average  
Average  
Average |                             |
| **Executive Functioning**    |                                                     |                             |
| Tower of London               | Total Moves: 104 | Average |                             |
| **Behavior Assessment**       |                                                     |                             |
| System for Children (BASC)    | Parent and Self Report: Elevated Anxiety and Depression scales | Clinically Significant |
Case Example 4

- **Strengths**: Average to high average cognitive profile
- **Limitations**: Clinically significant symptoms of depression and anxiety. Poor sleep

What helps individuals to be successful despite areas of weakness?

- Family support
- Adherence to medical needs
- Counseling/Coping strategies
- Community/social support
- Assistive technology
- Speech, occupational, physical therapies
- Motivation, self-awareness

Dutta et al., 2008
Gamble, Dowler, & Oundene, 2006
Goldberg, Higgins, Raskind, & Herman, 2003
Werner, 2000
Success includes more than IQ

• Duckworth and Seligman (2005) found that self-discipline, not IQ, predicted gains in academic performance over the school year in 8th graders

• Personality traits may predict academic success in college
  – Conscientiousness predicted GPA, course performance, and attendance over SAT scores in undergraduate students (Conard, 2006)

Conclusion

• Many factors to consider when interpreting neurocognitive profiles
  – Similar IQ may present very differently based on other factors
    • Usually reflected in concluding or summary sections of reports
  – Leads to different vocational goals and employability
Resources

• Division 40 of American Psychological Association (APA)-Society of Neuropsychology
• APA information on psychological evaluations
• Explanation of types of psychological testing
  – http://psychcentral.com/lib/types-of-psychological-testing/?all=1

References


Questions?

Thank you for your attention!