A Consumer's Guide to Neuropsychological Evaluation

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Objectives

- Understand what is neuropsychological assessment. Who it is for and how used?
- Know the elements of a good evaluation
- Problems typically seen
- Case review
- Q & A

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What is Neuropsychology?

- The study of brain-behavior relationships
- Not a set of tests or techniques
- A way of thinking about cognitive abilities, academic achievement, and behavior – often expressed as test scores

The Object of Investigation

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PARENT'S BRAIN
(ADOLESCENT'S PERSPECTIVE)

"Each child's brain is as similar and/or unique as their face."

Martha Denkla, M.D.

Therefore…..

accurate assessment of a child's functioning should be comprehensive.

Broad Scope

Appropriate in Depth (Sampling)

Child Development

An evaluation = snapshot in a child's developmental timeline

DEVELOPMENT: PIAGET'S

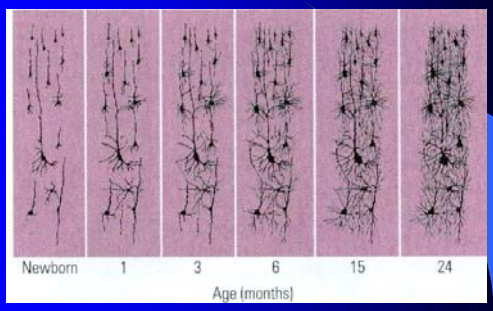
Stage 1: Sensorimotor (Birth to 18-24 months)
- Experiences world through senses and actions

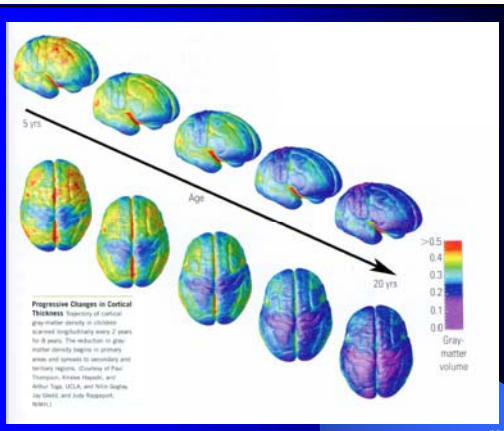
Stage 2: Preoperational (2 – 6 years)
- Represents things with words and images

Stage 3: Concrete Operational (7 – 11 years)
- Thinks logically about concrete events; grasps concrete analogies & performs arthmetical operations

Stage 4: Formal Operational (12+ years)
- Reason Abstractly

DEVELOPMENT: CELLULAR





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DEVELOPMENT:

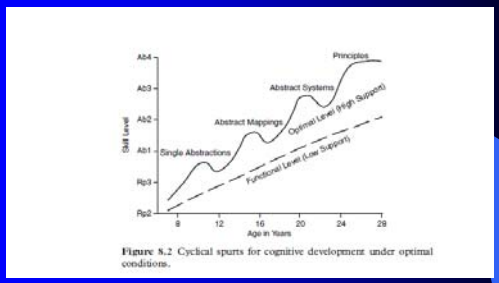

Figure 8.2 Cyclical spurts for cognitive development under optimal conditions.

Cited in Fischer, K. W. (2008).

WHO IS IT FOR

Factors That Can Influence School Performance

- Intellectual Disability
- Specific Learning Disabilities
  - Reading, Writing, Math (3 Rs)
  - Receptive – Expressive Language
  - Sensory-Motor Functioning
- Emotional/Behavioral Disturbances
  - Mood and Anxiety Disorders
  - Oppositional Defiant and Conduct Disorders
- Executive Dysfunction
  - Attention Deficit/Hyperactivity Disorder (ADHD)

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Factors That Can Influence School Performance

- Socio-economic
  - e.g., poverty
- Sensory Impairments
  - Vision
  - Hearing
- Brain Injury
- Pervasive Developmental Disorders
  - Autistic Spectrum Disorders
  - Asperger's Disorder

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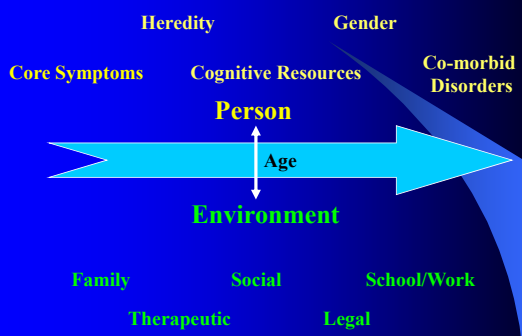
Developmental Model



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Need for Comprehensive Evaluation

- Given the complexity of the situation, a comprehensive evaluation will increase the likelihood of accurately identifying the core problems to be addressed in school and possibly for treatment.
- Evaluation is the most important part of intervention.

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MAXIMIZATION PROCEDURE

Neuropsychological Evaluations are conducted in a manner to obtain "Best Performances"

INFLUENCES ON TESTING*

- Testing environment
- Examiner-examinee rapport
- Oral presentation style and rate
- Similarity or familiarity between the personal characteristics of examiner and examinee
- Supportive or encouraging gestures and comments
- Test-taking anxiety (just the patient?)

* Anastasi (1988)

GOOD ADMINISTRATION

1. Follow standardized procedures, unless the child's limitations would interfere with a valid administration, then carefully adjust.
2. Minimize environmental factors extraneous to brain-behavior relationship under study
3. Make sure examinee is alert and sufficiently aroused
4. Record all responses and response times
5. Provide sufficient help and encouragement to ensure task is being attempted

PRINCIPLES OF NSY EVALUATION

Tests are multifactorial. Different individuals may obtain the same score for very different reasons. This applies equally in cases of success as well as failure.

Elements of a Good Evaluation

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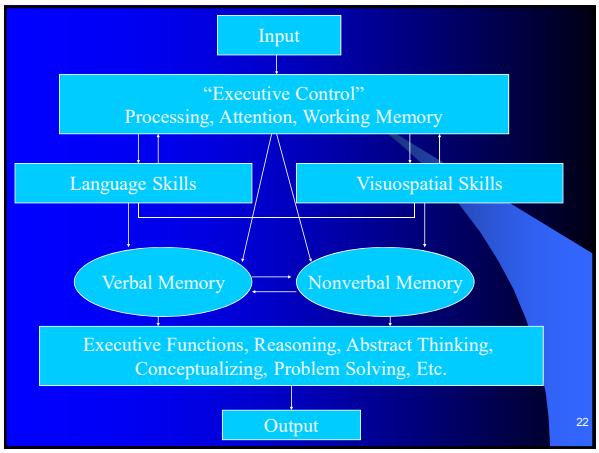

EXECUTIVE SKILL MODEL

- Self Monitor
- Sustain
- Plan
- Organize
- Working Memory
- Initiate

- Emotional Control
- Shift
- Inhibit

Metacognitive: Problem Solving

Behavioral/Emotional Regulation

ELEMENTS OF NEUROPSYCH EVAL

Multiple sources of information

- Clinical interviews of parent(s) and child
- Historical Review
  - Developmental
  - Educational
  - Medical
  - Psychiatric
  - Family
- Input of Educators

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ELEMENTS OF NEUROPSYCH EVAL

- General Intelligence
- Attention/Concentration/Orientation
- Executive Functions
  - Initiating, sustaining, inhibiting
  - Mental flexibility, set-shifting
  - Concept formation, problem solving
- Receptive & Expressive Language
- Visual-Spatial & Visual-Motor Integration

ELEMENTS OF NEUROPSYCH EVAL

- Motor Functioning
- Sensory/Perceptual Functioning
- Learning & Memory
- Psychological/Emotional Functioning
- Social Functioning
- Academic Achievement

ELEMENTS OF NEUROPSYCH EVAL

Five Pillars for Reading Success:

- Phonemic Awareness – manipulation of spoken syllables in words
- Phonics – letter-sound correspondence
- Fluency – reading speed and accuracy
- Vocabulary – lexicon of known words
- Comprehension Skills – deriving meaning from print

Mathematics:

- Fluency
- Numerical Operations
- Quantitative Reasoning

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ELEMENTS OF NEUROPSYCH EVAL

Additionally, the evaluation should assess the child's mood, interpersonal functioning, effort and other behaviors/factors and their potential impact on current test performance.

ELEMENTS OF NEUROPSYCH EVAL

"Threats to test validity"

The Neuropsychological Evaluation should answer both the questions posed by the referring source as well as those relevant but unasked questions.

Social Inability

- Frequent problem area for individuals with AD/HD and LDs, other Neurodevelopmental conditions, and traumatically acquired brain dysfunction that has direct, significant impact on functioning.

Social Inability

Given the tremendous amount of "data" needing to be processed and responded to in "real time," social skill difficulties would be predicted, if not expected, and can be understood in terms of weaknesses in attention, process speed, inhibition, and executive functions.

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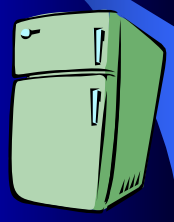
PROBLEMS ENCOUNTERED

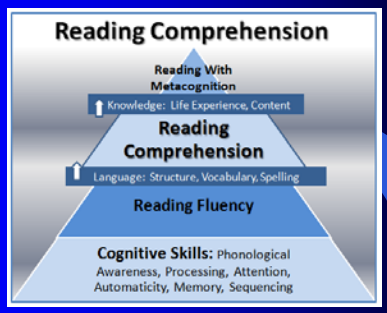
- Appropriate normative data
- Appropriate level of difficulty
- Established reliability & validity
- Adequate coverage of relevant cognitive domains
- Multiple measures of domains
- Scoring
- Interpretation

"WHAT DOES YOUR MEAN REALLY MEAN?"

"IF YOUR CRITERION FOR A DIAGNOSIS OF READING DISORDER IS A SPECIFIC SCORE ON A READING TEST…

"…THEN SMALL CHILDREN, PETS, AND HOUSEHOLD APPLIANCES ARE ALL LIKELY TO BE LABELED READING DISORDERED"





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ASSESSMENT IS "A BODY-CONTACT SPORT"

- WALSH, 1992

TYPICAL QUESTIONS

1) What are the areas of weakness? Strengths?
2) How impacted is this student?
3) Is the student progressing or declining?
4) Does the student qualify for services?

"WHY TEST?"

Ideally, the **benefit** is that the score can provide objective, reliable, replicable data in a form that can aid interpretation and permit meaningful comparison across patients and across areas of function within a patient.

"WHY TEST?"

Test Score = a standardized method of summarizing (usually) observed behavior.

- Examiner evaluates each behavior sample, fitting it to a predetermined scale (often Pass/Fail, 1/0)
- Test with more than one item typically render summary scores (frequently a simple summation)

"HOW IMPAIRED IS THIS STUDENT?"

"What does this score mean?"

Test scores in and of themselves have little meaning in isolation. To derive meaning, some comparison is made.

"Daddy, I got a 30 on the Math test!"

"HOW IMPAIRED IS THIS PERSON?"

Norm-referenced

- Grade Equivalents
- Percentile Ranks
- Standard Scores (T score, *z score*)

Criterion- referenced

- "Mastery Level" (% correct)
- Cut-off score

"HOW IMPAIRED IS THIS PERSON?"

Typical Rule of thumb: 2 SD deviation from premorbid functional level represents significant impairment.

- Too Stringent
- Will miss too many students

"Clinical neuropsychology is not about test data and the application of statistical rules alone but about a much underused process called…..Thinking.

Learning Disability: Prevalence

- A child with reading disabilities is 2x as likely as a member of the general population to meet diagnostic criteria for ADHD (15% vs. 7%).
- Individual diagnosed with ADHD more likely than an individual in the general population to have a reading disability (36% vs. 17%).
- Despite co-occurrence, studies suggest reading disabilities and ADHD are distinct and separable disorders.

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ADHD: Hyperactive-Impulsive Symptoms

- Fidgets with hands or feet or squirms in seat
- Leaves seat inappropriately
- Runs about or climbs excessively (in adolescents/adults subjective feelings of restlessness)
- Has difficulty playing quietly
- Acts as if "driven by a motor"
- Talks excessively
- Blurts out answers before questions have been completed
- Has difficulty awaiting turns
- Interrupts or intrudes on others

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ADHD: Inattention Symptoms

- Difficulty sustaining attention, effort, "motivation"
- Fails to give close attention to details/makes careless mistakes
- Does not seem to listen when spoken to directly
- Does not follow through on instructions/fails to finish work
- Has difficulty organizing tasks and activities
- Avoids tasks requiring sustained mental effort
- Loses thing necessary to tasks
- Easily distracted by extraneous stimuli
- Forgetful in daily activities

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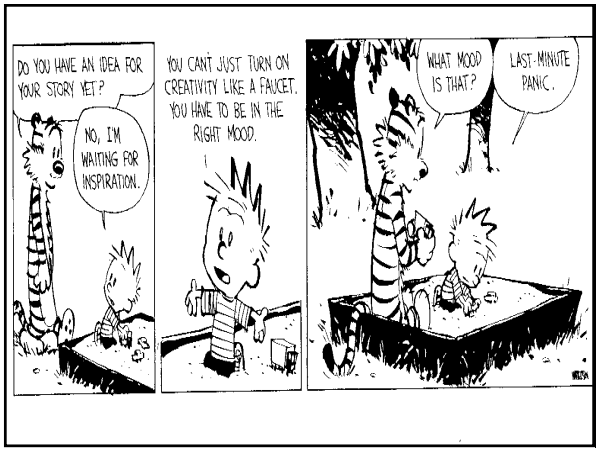

ADHD(DSM-IV): Prevalence

- Range 2-9.5% school-aged children (Avg. 3-4%)
- Rates fairly consistent in other countries
- 4.7% of Adults (Chronic Condition)
  - Many of those identified as children, while no longer meeting the current clinical dx, were found to still be having sig. adjustment problems at work, in school, or in personal/social settings.
- 3:1 Males to Females

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ADHD (DSM-IV) Comorbidity

- Poor School Performance (> 90%)
- Learning Disabilities (24-70%)
- Peer Relationship Problems (50-75%)
- Major Depression (27% by age 20)
- Anxiety Disorders (25%)
- Bipolar Disorder (6-10%)
- Oppositional Defiant D/O (40-67%)
- Delinquent / Antisocial Behavior (18-30%)
- Substance Use/Abuse (10-20%)

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Executive Functions

- Core problem area for ADHD
- Of increasing importance in higher grades
  - Begins to come into play around 3rd – 4th grade
- Affects the *process* of how one learns rather than the *content*.

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EXECUTIVE SKILL MODEL

- Self Monitor
- Sustain
- Plan
- Organize
- Working Memory
- Initiate
- Emotional Control
- Shift
- Inhibit

Metacognitive: Problem Solving

Behavioral/Emotional Regulation

DESIRABLE BEHAVIORS

ELIGIBILITY FOR SERVICES

- Does the child meet criteria for one or more of the existing disability categories?
- Does the child's disorder have an adverse impact on educational performance?

ELIGIBILITY FOR SERVICES

- Does the child need special instruction to ensure a free, appropriate public education (FAPE)?
- Does the child's disorder substantially limit , to a greater degree than the Average person, one or more important life activities?

RECOMMENDATIONS

- Tailored to the individual child
  - considers strengths as well as areas of weakness
- Age-appropriate
- Variety of interventions
- Low tech & High Tech