NUEROPSYCHOLOGY OF ASSESSMENT- GOING BEYOND THE MISDIAGNOSIS OF LAZINESS

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LEARNING DISORDERS

OBJECTIVES

To galvanize an appreciation of neuropsychological assessment as approaches in understanding the learner.

- THE BRAIN

- METHODS of STUDYING the BRAIN

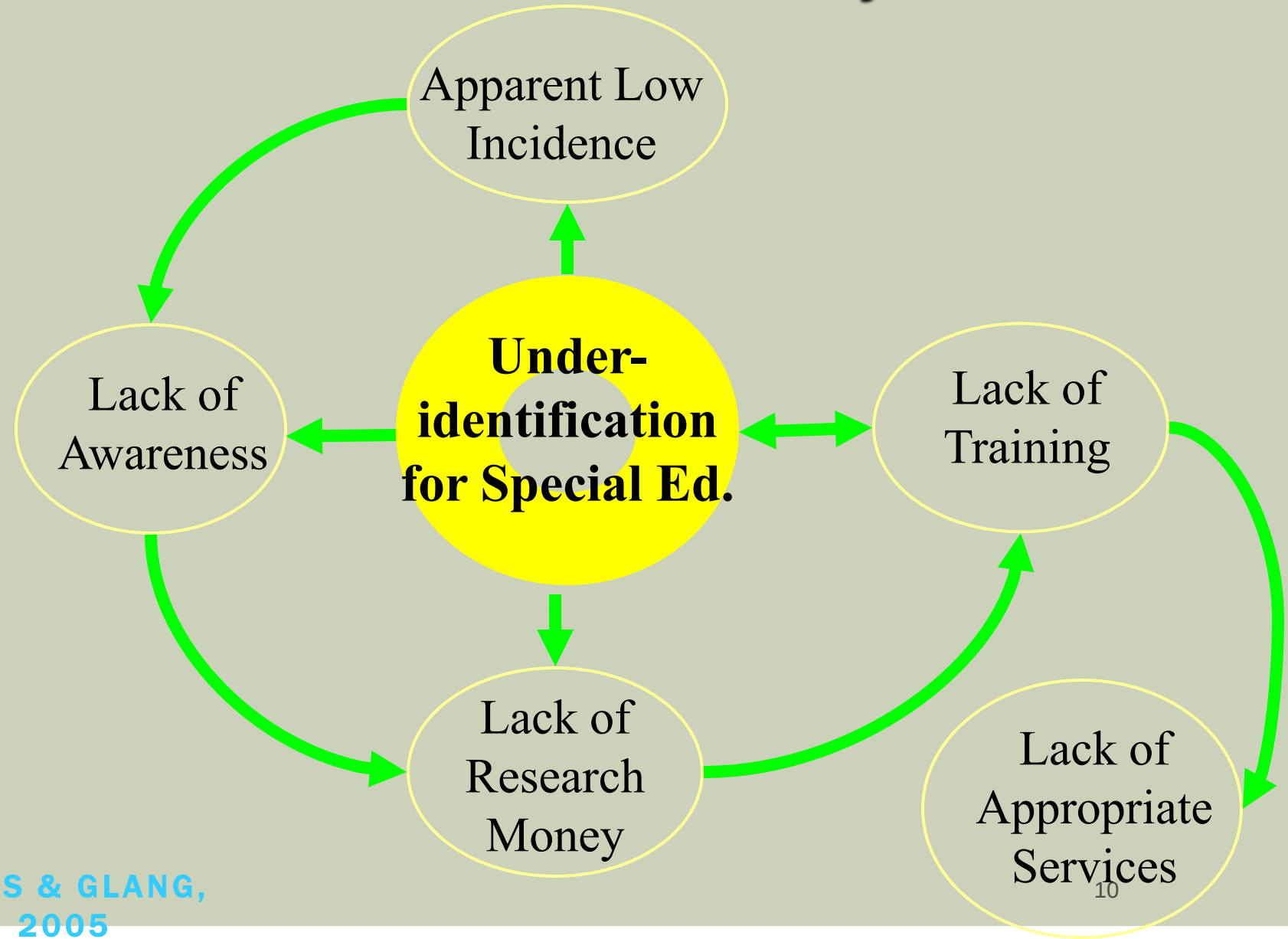
WHAT IS TRAUMATIC BRAIN INJURY?

PREVALENCE OF TBI

Brain injury is the
leading cause
of death
and disability
in children
and young adults.

NUMBERS: WHERE HAVE ALL THE CHILDREN WITH TBI GONE?

Under-identification Cycle



TODIS & GLANG, 2005

Common Causes for School-Aged Children

PUZZLING PARADOX OF PEDIATRIC BRAIN RECOVERY

- Prognosis for functional recovery of *old* skills is better in early brain injury
- Prognosis for acquiring *new* skills after injury is worse after early brain injury

COMMON CHARACTERISTICS OF LD STUDENTS

Some common characteristics of students with LD include:

1. Learning Characteristics:
   - Average or above average intelligence

2. Behavioural Characteristics:
   - Attention problems, Hyperactivity, Behavioural/emotional difficulties

DYSLEXIA

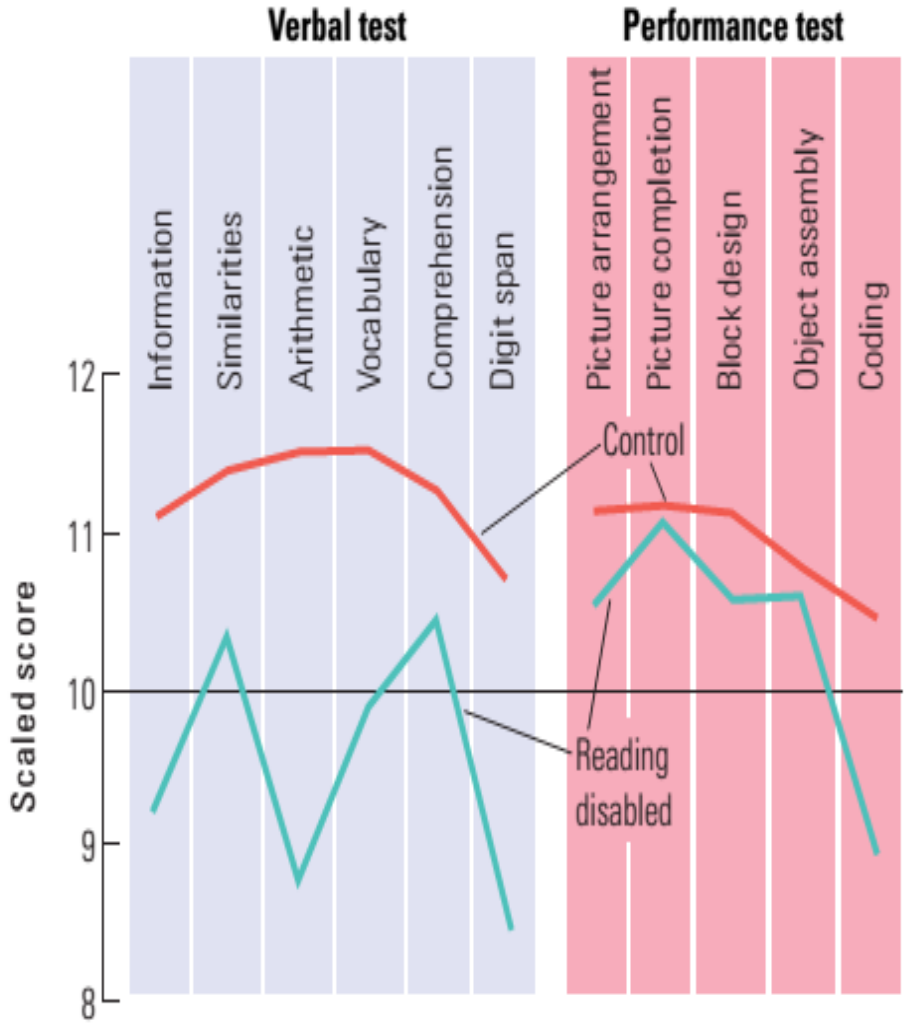


Figure 24.2

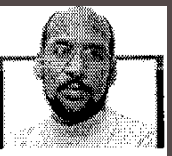
The ACID Profile Intelligence test profiles of developmentally dyslexic subjects and controls. Note the low scores on arithmetic, coding, information, and digit span (ACID) typical of children with reading disabilities. (From Rugel, 1974; after Whishaw and Kolb, 1984.)

	Reading-disabled	Control
Verbal IQ	98	108
Performance IQ	102	106
Full-scale IQ	100	107
Number of subjects	1521	554

THE JAMAICA OBSERVER
Wignall's WORLD

How did he enter UWI Mona? Sunday, May 06, 2007

- The following is one e-mail response to my article. It came from a student in the Math Department. He is very obviously not a supporter of Farley but I would like my readers to skirt the surface of a mind that somehow, by a crazy mix of 'turd' world standards, and the need to cram the Math Department with all available students, the university found it useful to admit him. Here goes the e-mail, which he wrote on April 26. I am giving it verbatim

THE JAMAICA OBSERVER Wignall's WORLD 

How did he enter UWI Mona? Sunday, May 06, 2007

- "Quiet an interesting article, I must say Mr. Wignall. It has become a real interest of mind and some of my fellow classmates that it is time we allow you, and the media to know our side of [redacted]"UWI and Pfor. " issue. "I am currently a student at the University of the West Indies, pursuing a degree in the field of Computer Science and Mathematics. I must agree with some of the issues raised by the Prof. The one that stricks me the most is "the headless math department" but let us not loss focus hear, Isn't he a member of the math department and a very prominent one [redacted]? From this, I think I would not be out of line to say that, Prof. is quit headless. Dont you think?

THE JAMAICA OBSERVER

Wignall's WORLD

How did he enter UWI Mona? Sunday, May 06, 2007

"You see Mr. Wignall, what is really happen is not been told. I cant say you or your article is being biased or unfair seeing that you are actually hearing one side of what I would call a three side story. There is the students side, the department side, and the prof. side. "

Just a snoppist, it am sure that in all the report that the prof. has made he has never mentioned to you the number of times he missed classes and I am not talking missing class for a day I am talking for weeks, he has never mentioned the number of time he kept class during the time allotted to other couses and when "I" went to him and told him of the inconvience he is putting me in, his reply was "WELL IF YOU CANT COME THEN DONT COME GET THE NOTES FROM SOMEONE".

THE JAMAICA OBSERVER

Wignall's WORLD

How did he enter UWI Mona? Sunday, May 06, 2007

Mr. Wignall we are talking "Abstract Algebra" here, the world "Abstarct" alone will scare you. "A fellow class mate said you, responed and told her we should write and attached our number I would really like you to have the views of all the students, we should be having abstract algebra finals on friday 27 at 1pm dont know how possible it would be for u to show up but would be grately appriciate. I really wouldnt mind having a talk with you either so if it is convient to you I would greatly appriciate a call."

'Thanks, Concerned Student'

As for me,' I, responded to him but that is 'unfit for airplay'.

ACQUIRED VS. DEVELOPMENTAL DYSCALCULIA

Acquired Dyscalculia

Developmental Dyscalculia

COMMON MATH ERRORS:

- ME: 6+5= 10
- OE: 9+3 = 6 [9-3]
- AE: 123 [subtracted smaller from larger number despite placement]
  87
  164
- PE: .70
  + .76
  .146 [incorrect placement of 1]

NEUROANATOMY OF DYSCALCULIA

Left Hemisphere

- Damage to the *left frontal region, perisylvian region, inferior parietal lobe and basal ganglia* are all associated with difficulties in math.

Right Hemisphere

- Impaired visio-spatial skills

ASSESSMENT OF DYSCALCULIA

- Difficult since there are multiple reasons for being bad at math:
  - Inappropriate teaching
  - Anxiety
  - Lack of motivation
  - Low self efficacy
  - Poor school attendance
  - Poor learning capacity

ASSESSMENT OF DYSCALCULIA

- Diagnosis can only be made after administering:
  a. Cognitive test (measure of overall IQ)
  b. Standardized arithmetic/ achievement test

  * These should be followed up by neuropsychological testing to determine the localization of the problem [battery should be comprehensive, testing the many factors involved- memory, perception, executive functioning etc.]

TREATMENT OF DYSCALCULIA

- Due to the wide variety of problems, treatment plans vary.
- Recognizing how child solves math problems & the types of errors they make, can help us understand how to aid them and/or help them compensate for their deficits

TREATMENT OF DYSCALCULIA

PROGNOSIS

- Prognosis depends largely on:
  - Specific type of difficulty with mathematics

MATHEMATICS DISORDER (DYSCALCULIA)

- (Affects 1% of school children)
- **Linguistic skills**
- **Perceptual skills**
- **Attention skills**
- **Math skills**

DISORDER OF WRITTEN EXPRESSION (DYSGRAPHIA)

- Composing and organizing written text is problematic

MOTOR SKILLS DISORDER

- Commonly associated with other learning disorders
- Developmental Coordination Disorder

COMMUNICATION DISORDERS

- Communication difficulties involving verbal language including sign language

COMMUNICATION DISORDERS

Mixed Receptive-Expressive Language Disorder

- (Detectable before age 4. May occur in up to 3% of school-age children. Two types: Developmental in which speech may begin late and Acquired due to encephalitis or head trauma)

COMMUNICATION DISORDERS

- **Phonological Disorder**
- (2-3% of 6-7 year-olds present with moderate to severe cases)
- Failure to use developmentally expected speech sounds that are appropriate for age and dialect.

Image retrieved from: http://www.soundpiper.com/mln/wern2.jpg

THE NEUROPSYCHOLOGICAL ASSESSMENT BATTERY APPROACH

Clinical Interview

Behavioural Observations

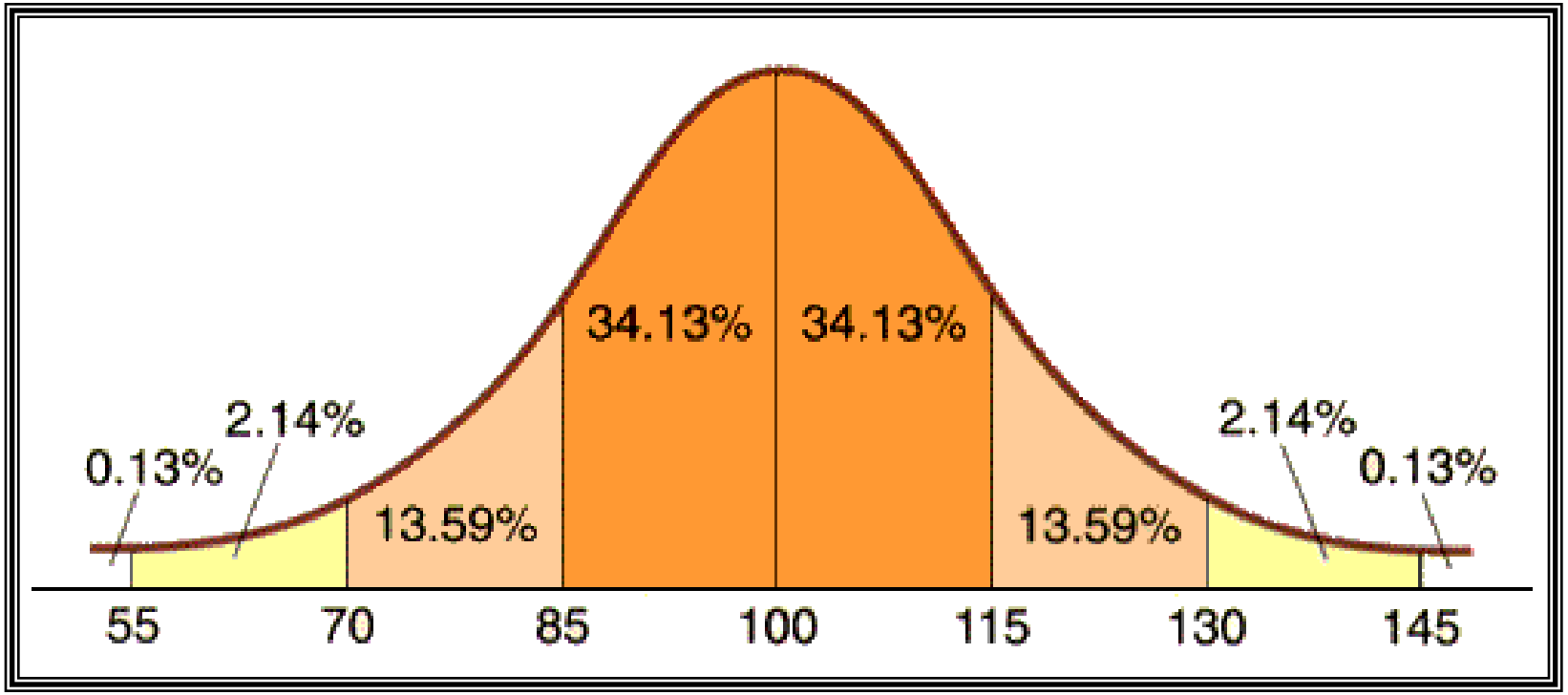
Formal Psychological Assessment

- Intelligence tests
- Academic achievement tests

QUALITATIVE FACTORS

DISCUSSION!!!

UNDERSTANDING IQ AND ACHIEVEMENT SCORES



RELATIVE & COMPARITIVE ABILITIES

DISCUSSION & DEMONSTRATION!!!

INTERVENTION STRATEGIES

- Individuals with memory and learning problems may be helped through a variety of interventions.

TREATMENT

- The most common treatment for learning disabilities is special education.

TREATMENT OF CHILDREN WITH LEARNING DISORDERS

- Evaluation of the following abilities is strongly recommended in children with learning problems:
  - Auditory processing/phonemic awareness Attention
  - Working memory
  - Executive functions (metacognition)
  - Processing speed

WORKING MEMORY

- This is the ability to hold information in mind while performing a mental operation.

AMNESIA AND DIFFERENTIAL DIAGNOSIS

- Memory problems must be differentiated from more common forms of memory loss.

PROCESSING SPEED

- This skill has been found to be related to ability as well as to learning skills

REMEDIATION

- Neurologically the child lays down neural connections that once formed may be difficult to reteach.

EXECUTIVE FUNCTIONS

- Important for the child to evaluate his/her performance and to self-correct

NEUROPSYCHOLOGY

- THE INQUIRY…

MYTHS ABOUT CHILDREN

- This is a low incidence population and schools do not really have to be concerned with serving them.
- They will grow out of it.
- Mild injuries (concussions) are not a real problem.

- THE FRONTAL LOBE

- THE TEMPORAL LOBE

- THE OCIPITAL LOBE

- THE PARIETAL LOBE

COMMON CHARACTERISTICS OF LD STUDENTS

3. Social Characteristics:

- Weak Social Skills and Interpersonal Relationships

- Students who show very few strengths, and don't have a non-academic area in which to excel, may exhibit social problems.

CASE ILLUSTRATIONS

EMOTIONAL IMPLICATIONS

- Low self esteem!
- Anxiety!
- Depression!
- Somatic complaints!
- Task avoidance / Malingering!
- Munchousen syndrome/proxy?!!!

ATTENTION

- In order for something to be learned, it has to be attended.
- Attention has been found to play an important role in reading and reading comprehension
- Children with ADHD tend to have more difficulty with comprehension than with decoding.

THANK YOU!

Thank

You

Very

Much

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