Neuropsychological Assessment of FASD in the Adult Criminal Justice System: Diagnosis, Profiles, and Patterns

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What is a Neuropsychological Assessment

- A series of tests designed to measure brain functioning
- Does not diagnose “brain damage” per se but “brain dysfunction”
- Looking for Significant Deficits (more than 84% of the population performed better)
  - Further broken into levels of severity (e.g. mild, moderate, severe)
  - However, at whatever level, it refers to **impairment** in functioning (e.g. intellectual disability)

A Brief History of Assessment

Tests based on functions found to be impaired in people with damage to brain in multiple areas

Often initially learned from case studies in which specific regions of brain have been damaged resulting in specific deficits

Then followed up by systematic studies

- Memory deficits related to damage to parts of temporal lobe (hippocampus)
- Executive function deficits related to damage to frontal lobes
- Study larger groups of people with specific pathology (TBI, Stroke, Tumor, FASD, etc)

Why is Neuropsychological Assessment of FASD Relevant in Court?

- FASD = brain damage that may affect executive functioning →
- Executive functioning = judgment, decision making, impulse control →
- Judgment, decision making, impulse control **impact all aspects of behavior in the legal context** (including the criminal behavior and ability to function in court)

Phases of Criminal Cases

Pre-Trial

Guilt/Innocence

Sentencing

Appeal

Post Conviction Relief

Types of Questions Often Asked for Pre-Trial

- Intellectual Disability
  - Atkins issues
- Competency
  - Especially re assisting counsel
- Adult vs. Juvenile court

Types of Questions Often Asked for Guilt/Innocence

- Intellectual Disability
- Competency
  - Especially re assisting counsel
- Fragile Victim
- Insanity
- Diminished Capacity

Types of Questions Often Asked for Sentencing

- Intellectual Disability
- Competency
  - Especially re assisting counsel
- Fragile Victim
- Diminished Capacity
- Mitigation

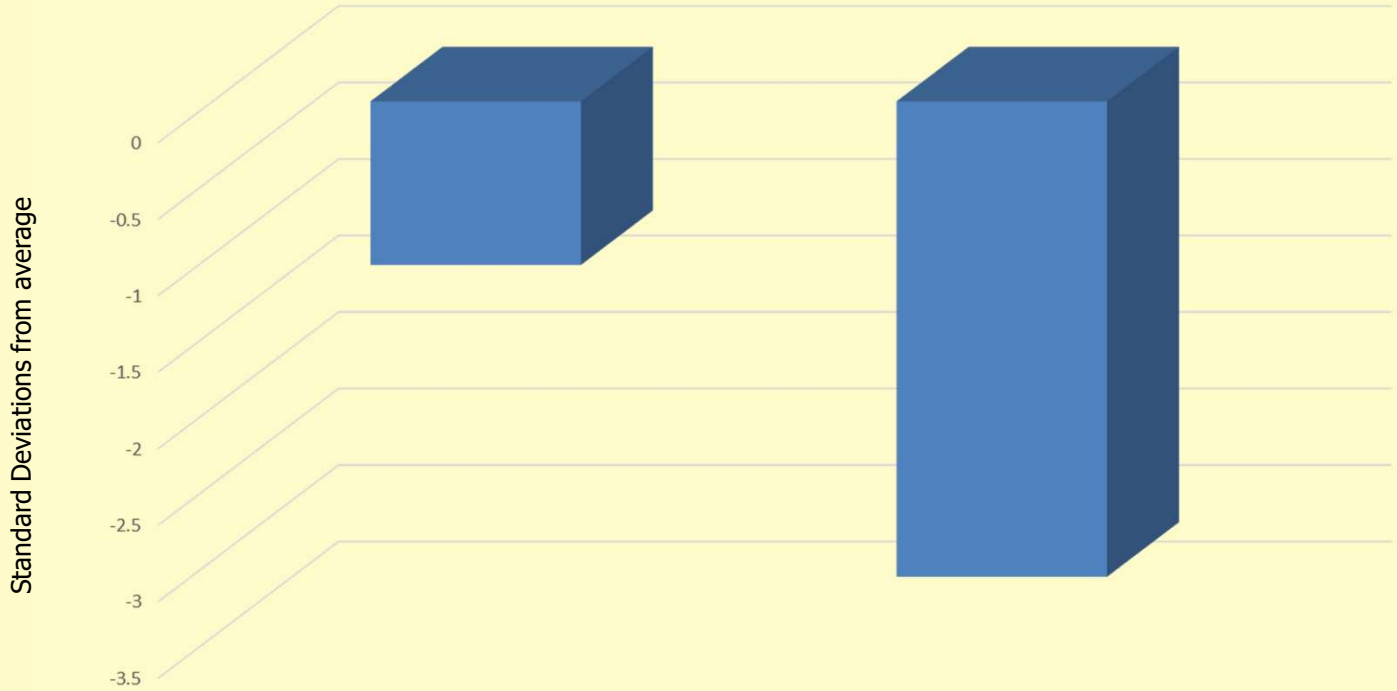
Types of Questions Often Asked for Appeal/Post Conviction

- Ineffective Assistance
- Intellectual Disability
- Competency
  - Especially re assisting counsel
- Diminished Capacity
- Mitigation

FASD and Competency Issues

- McLachlan, *et al*., 2014
    - Grisso Instruments for Assessing Understanding and Appreciation of *Miranda* Rights
    - Fitness Interview Test – Revised
- 90% of FASD showed impairment in at least one psycholegal ability
    - Impacted by IQ and reading comprehension
- 76% of those with FASD vs 28% in comparison group – impairments in one or more domains of FIT-R
- Variability, throughout the duration of the process
- FASD dx impacted understanding of trial process and ability to communicate above and beyond what would be expected from intellectual and academic deficits

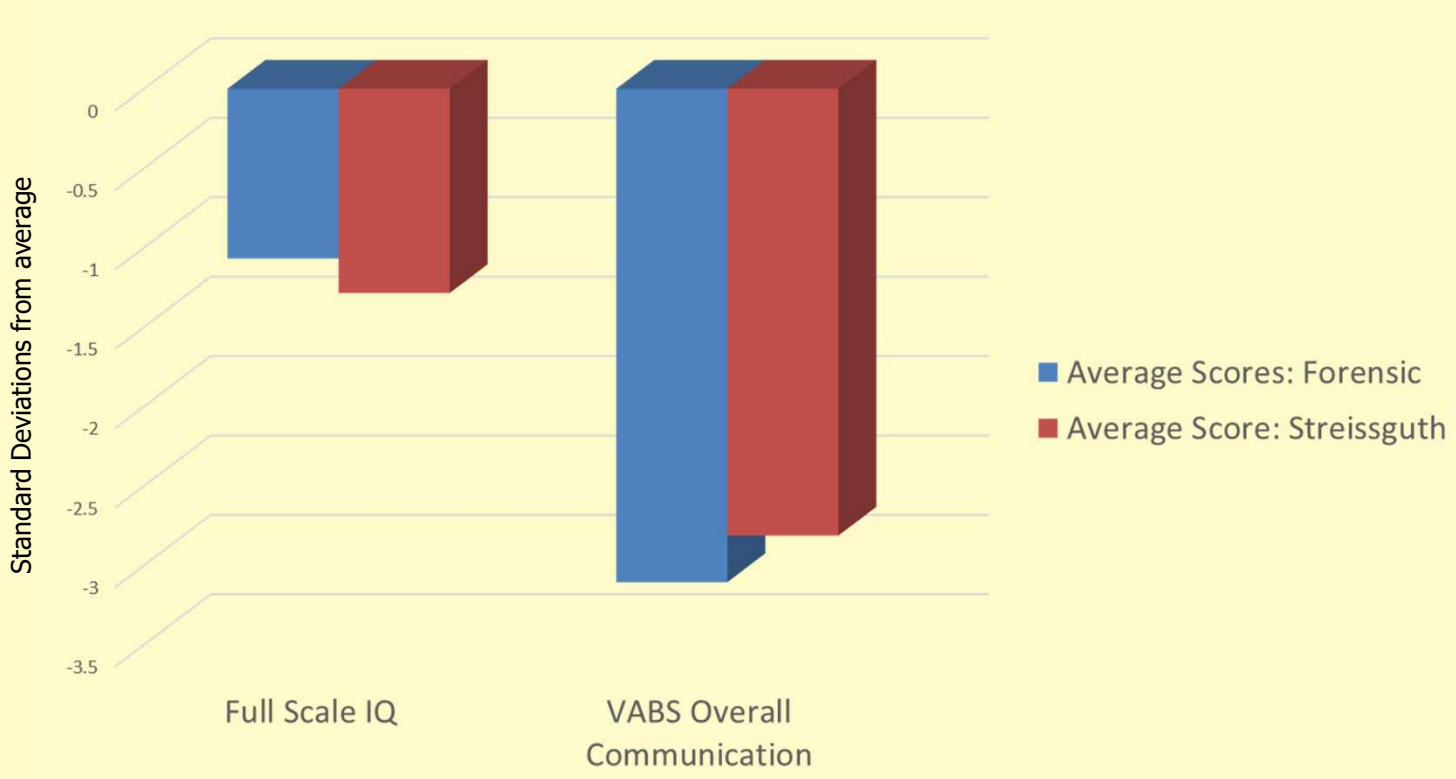
IQ and Communication-Related Testing in Legal Cases: Disconnection



Ave = 84

Ave = 53.4

Legal vs Non-Legal FASD Cases



Communication Impairments Impacts All Aspects of the Legal Process

- Criminal Act
  - Prone to misunderstanding what is said and the emotional implications of what others say (doesn't take a hint)
  - Prone to saying inappropriate things that could get them into problematic situations (unusual conversation topics, opinionated, etc)

Communication Impairments Impacts All Aspects of the Legal Process

- Police interactions
  - May appear more capable than actually are (talks a lot, chatty, etc) So often inappropriate expectations
  - However, if interacted more may notice increased problems (little content to what they say, perseverates on same topics)

Communication Impairments Impacts All Aspects of the Legal Process

- Interaction with attorneys
  - Because have opportunity (responsibility) to interact more with the client, they can pick up on the troubles with communication that could impact and thus seek assessment for competency and/or diagnosis

Communication Impairments Impacts All Aspects of the Legal Process

- In the Courtroom
  - May be able to learn (with considerable practice) the players in the courtroom and basic courtroom procedures

BUT

  - Communication impairments (and executive function impairments) may negatively impact ability to assist counsel

Record Review

- birth records
- medical records (birth mom, client)
- school records
- juvenile justice records
- adoption
- social services records
- out-of-home placements
- outpatient evaluations
- employment records (if any)

Records: Childhood

- Prematurity / birth complications / seizures
- Developmental delay (e.g., motor skills)
- Early speech and language problems
- Learning disabilities / SPECIAL EDUCATION (school testing very helpful)
- Academic problems in school
- Behavior problems in school and elsewhere
- Mental health diagnoses
  prior psychological neuropsychological evaluations

Records: Adolescence

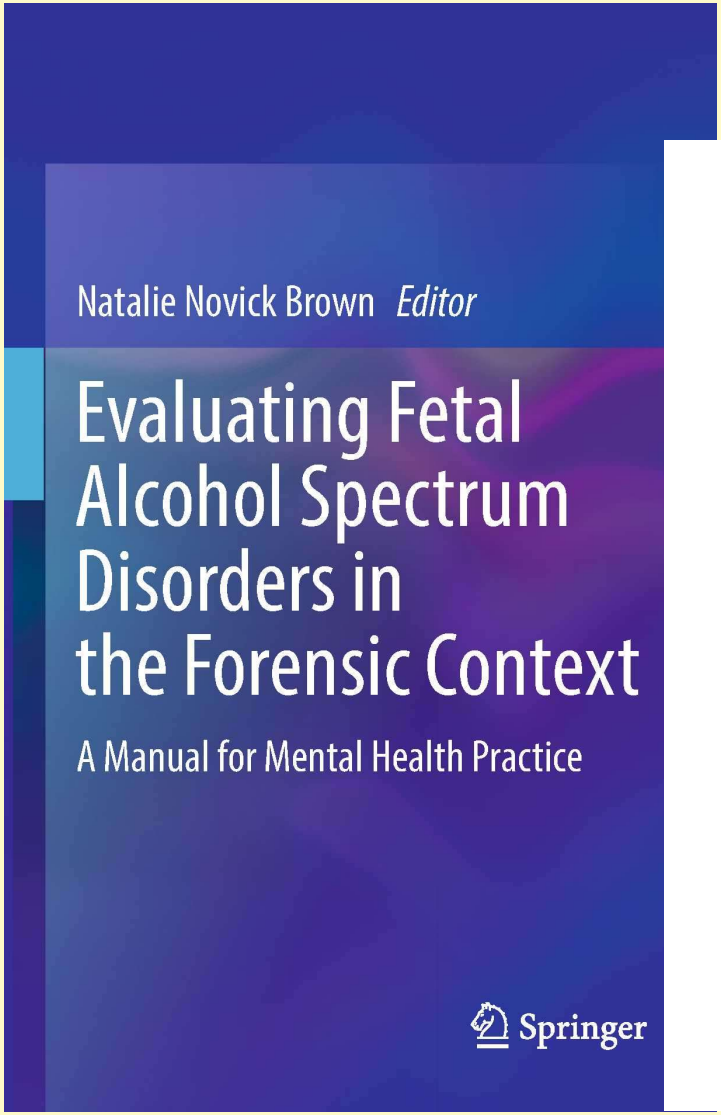
- School failure, disruption
- Mental health problems
- Substance abuse
- Sexually inappropriate behavior
- Inability to fit in with age-peers
- Ongoing self-regulation problems (viewed by adults as volitional)

Choosing the Battery

Effort Testing/Malingering

Battery for FASD Cases

- IQ (WAIS-IV)
- Achievement (WRAT-4)
- Visual Spatial Construction (RCFT)
- Learning and Memory (CVLT, RCFT)
- Attention (CPT)
- Motor Coordination (Grooved Pegs, Finger Tap)
- Executive Functions (WCST, DKEFS, COWAT, RFF, Stroop, ACT, Trails)
- Auditory Comprehension (NAB)
- Social Cognition (ACS)
- Suggestibility (GSS2)
- Adaptive Functioning direct assessment (TFLS)
- Adaptive behaviors assessing 3 domains of functioning (Vineland Adaptive Behavior Scale VABS)



Chapter 5
Neuropsychological Assessment of Fetal Alcohol Spectrum Disorder in Adults

Paul D. Connor

Abstract Assessment of current neuropsychological status is an essential component in the fetal alcohol spectrum disorders (FASD) diagnostic process. Because assessment and diagnosis of children with FASD has been occurring routinely for nearly 50 years now, psychometric measures that address this disability in children are fairly well established. By contrast, testing protocols for adults with possible FASD are less well described. The following chapter addresses the body of neuropsychological research in adults with FASD. Based upon this research and formal training in FASD as well as neuropsychology, I describe specific tests found to be sensitive to the effects of prenatal alcohol exposure. The chapter includes specific suggestions for presenting neuropsychological data in reports and testimony in order to make findings more understandable to legal professionals, which includes comparing individual performance to diagnostic guidelines and the FASD empirical literature.

Keywords Fetal alcohol spectrum disorder, FASD · Neurodevelopmental disorder associated with prenatal alcohol exposure, ND-PAE · Neuropsychological assessment

5.1 Introduction

Since fetal alcohol syndrome (FAS) was first identified and described in the United States in 1973 (Jones & Smith, 1973; Jones, Smith, Ulleland, & Streissguth, 1973), a large body of research has been published on the neuropsychological effects of prenatal alcohol exposure. Most of that research focuses on children and early adolescents with relatively little attention to adults with FASD, although it is clear FASD is a lifelong condition caused by permanent brain damage (Bookstein,

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N. Novick Brown (ed.), *Evaluating Fetal Alcohol Spectrum Disorders in the Forensic Context*, https://doi.org/10.1007/978-3-030-73628-6_5

Presenting Data in Court

FASD MILESTONES

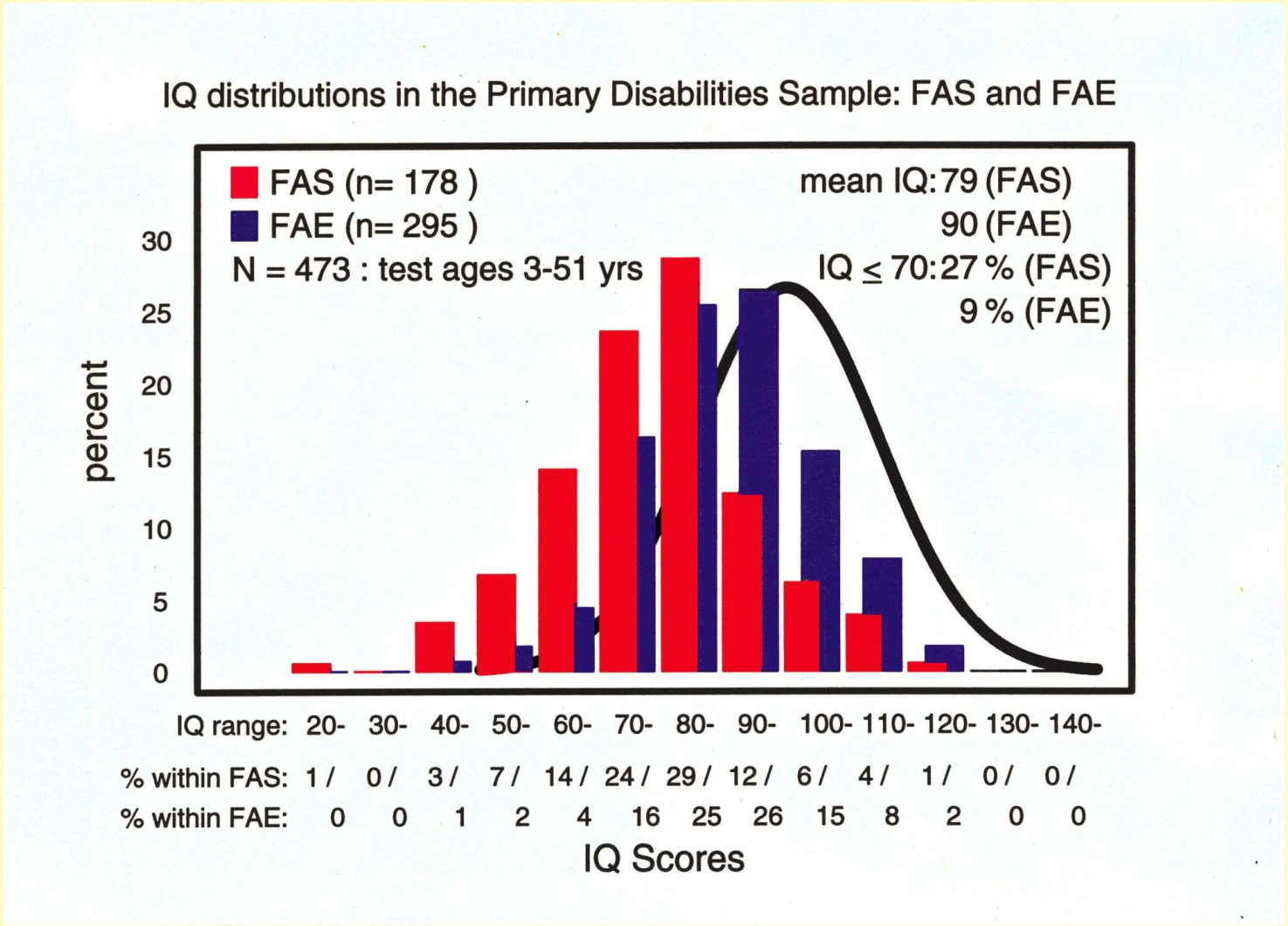
1973	“Fetal Alcohol Syndrome” reported in The Lancet.
1977	National Institute of Alcohol Abuse and Alcoholism (NIAAA) issues an official warning against heavy drinking during pregnancy.
1981	U.S. Surgeon General warns pregnant women and women planning a pregnancy not to drink alcoholic beverages.
1988	Alcohol Beverage Labeling Act.
1996	Institute of Medicine (IOM) develops diagnostic criteria for Fetal Alcohol Spectrum Disorders (FASD). (FAS, PFAS, ARND, ARBD)
1996	Final Report on Secondary Disabilities in Clients with Fetal Alcohol Syndrome and Fetal Alcohol Effects.
2004	Centers for Disease Control and Prevention (CDC) publishes more specific diagnostic criteria for Fetal Alcohol Syndrome (FAS)
2005	U.S. Surgeon General issues second warning pregnant women, women planning a pregnancy, and those at risk for pregnancy not drink alcoholic beverages.

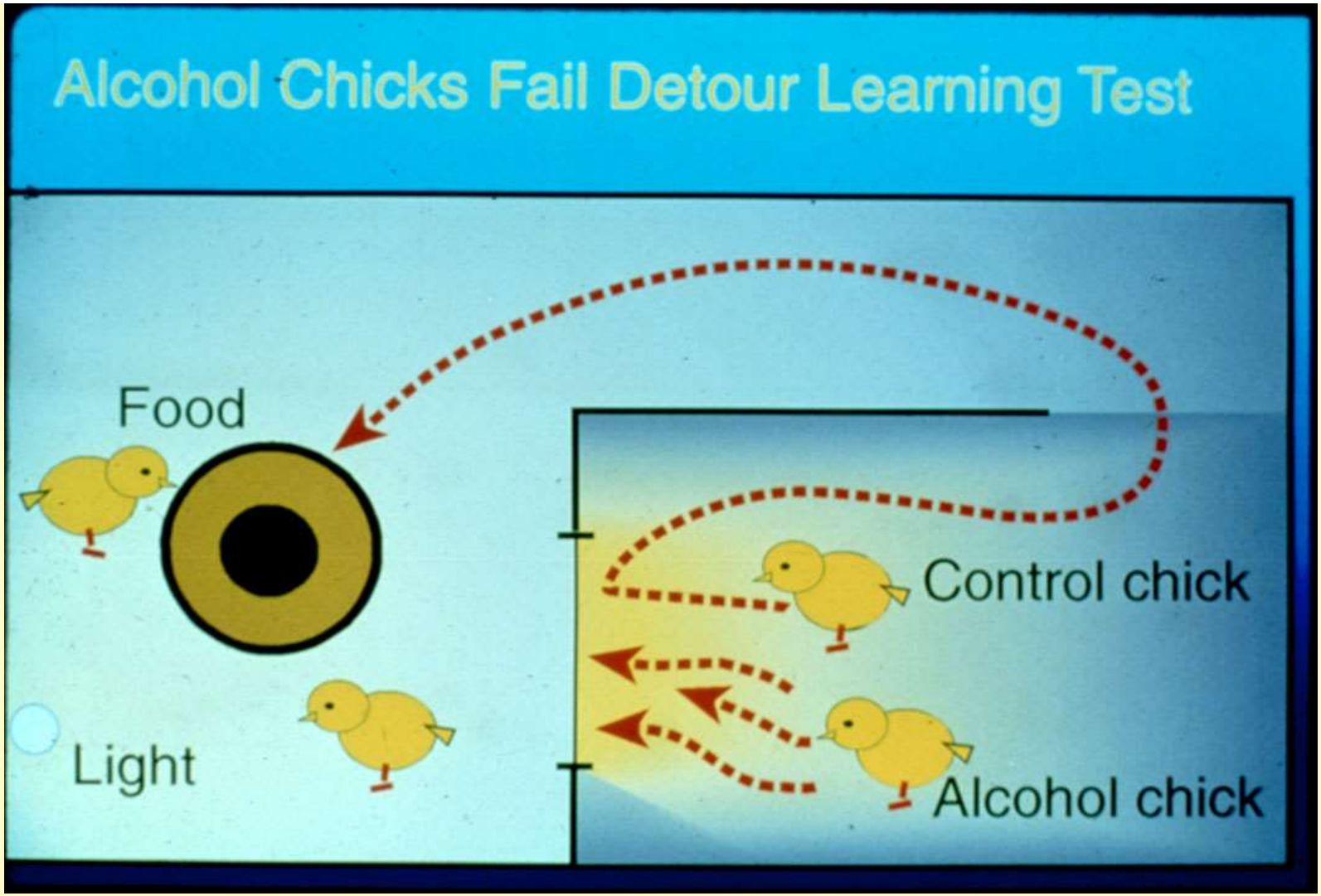
Alcohol is a Teratogenic Drug

- Alcohol freely passes from the mother's blood into the fetus.
- A fetus has no functioning liver early in gestation.
- Fetal brain cell death commences within 12 hours of maternal alcohol exposure.

Teratogenic Effects of Prenatal Alcohol Exposure

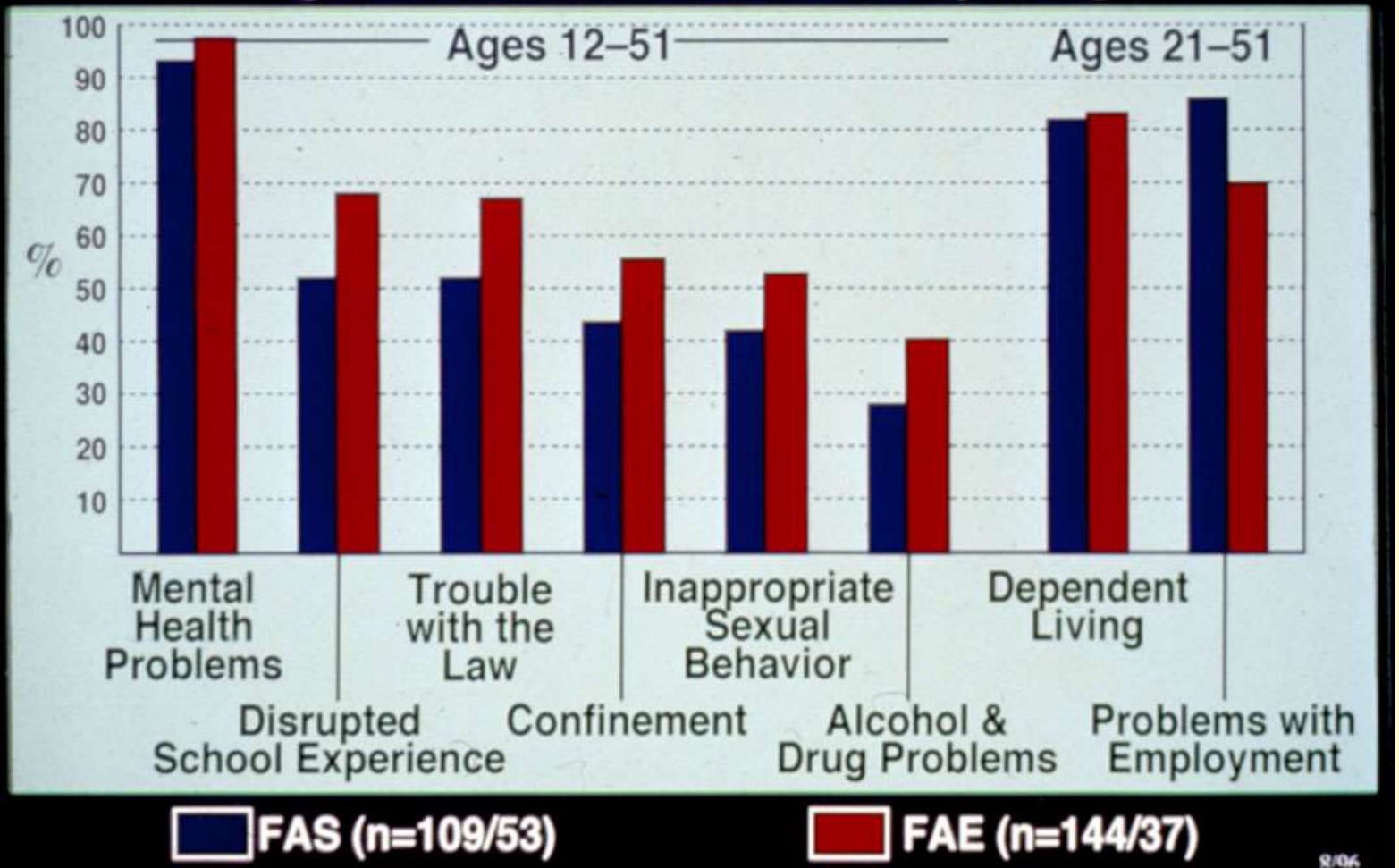
- Direct toxic effect of alcohol on cells
- Direct toxic effect of acetaldehyde on cells
- Hypoxia from impaired placental/fetal blood flow
- Effect on migration of cells
- Effect on apoptosis


IQ distributions in the Primary Disabilities Sample: FAS and FAE
FAS (n= 178)
FAE (n= 295)
N = 473 : test ages 3-51 yrs
mean IQ: 79 (FAS)
90 (FAE)
IQ ≤ 70: 27 % (FAS)
9 % (FAE)
percent
30
25
20
15
10
5
0
IQ range: 20- 30- 40- 50- 60- 70- 80- 90- 100- 110- 120- 130- 140-
% within FAS: 1 / 0 / 3 / 7 / 14 / 24 / 29 / 12 / 6 / 4 / 1 / 0 / 0 /
% within FAE: 0 0 1 2 4 16 25 26 15 8 2 0 0
IQ Scores



Means, McDaniel, Pennington (1989) *Alcoho*

HISTORY OF SECONDARY DISABILITIES
Among Clients ≥12 Years Old By Diagnosis



IOM Guidelines

- D. Evidence of CNS neurodevelopmental abnormalities, as in:
  - Decreased cranial size
  - Structural brain abnormalities
  - Neurological hard or soft signs such as **impaired fine motor skills, poor eye hand coordination**
- **E. Evidence of a complex pattern of behavior or cognitive abnormalities that are inconsistent with developmental level and cannot be explained by familial background or environment alone, such as learning difficulties; deficits in school performance; poor impulse control; problems in social perception; deficits in higher level receptive and expressive language; poor capacity for abstraction or metacognition; specific deficits in mathematical skills; or problems in memory, attention, or judgment**

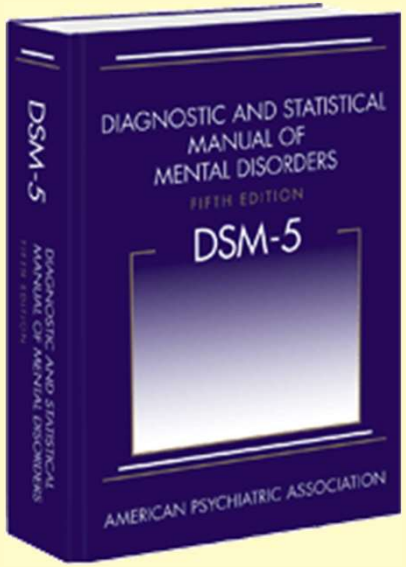
CDC Guidelines

- Functional Deficits
  - IQ 2 SD below average
  - Deficits 1 SD below average in at least 3 domains
    - Cognitive or developmental or **Discrepancies** (Including academics)
    - Executive functioning
    - Motor functioning
    - Attention or hyperactivity
    - Social skills
    - Other domains that can include sensory problems, pragmatic language problems (receptive and expressive communication), and learning and memory deficits among others (not meant to be an all inclusive list)

Using CDC Criteria to Apply to IOM

- CDC criteria is:
  - More structured
  - More able to be applied consistently and reliably across cases
- Therefore, they could be used as a method of quantifying IOM requirements for a "…complex pattern of behavior or cognitive abnormalities…"

Other Specified Neurodevelopmental Disorder



Neurodevelopmental Disorder Associated with Prenatal Alcohol Exposure (ND-PAE) is "characterized by a range of developmental disabilities following exposure to alcohol in utero." Page 86. DSM-5.

Expected Findings in FASD

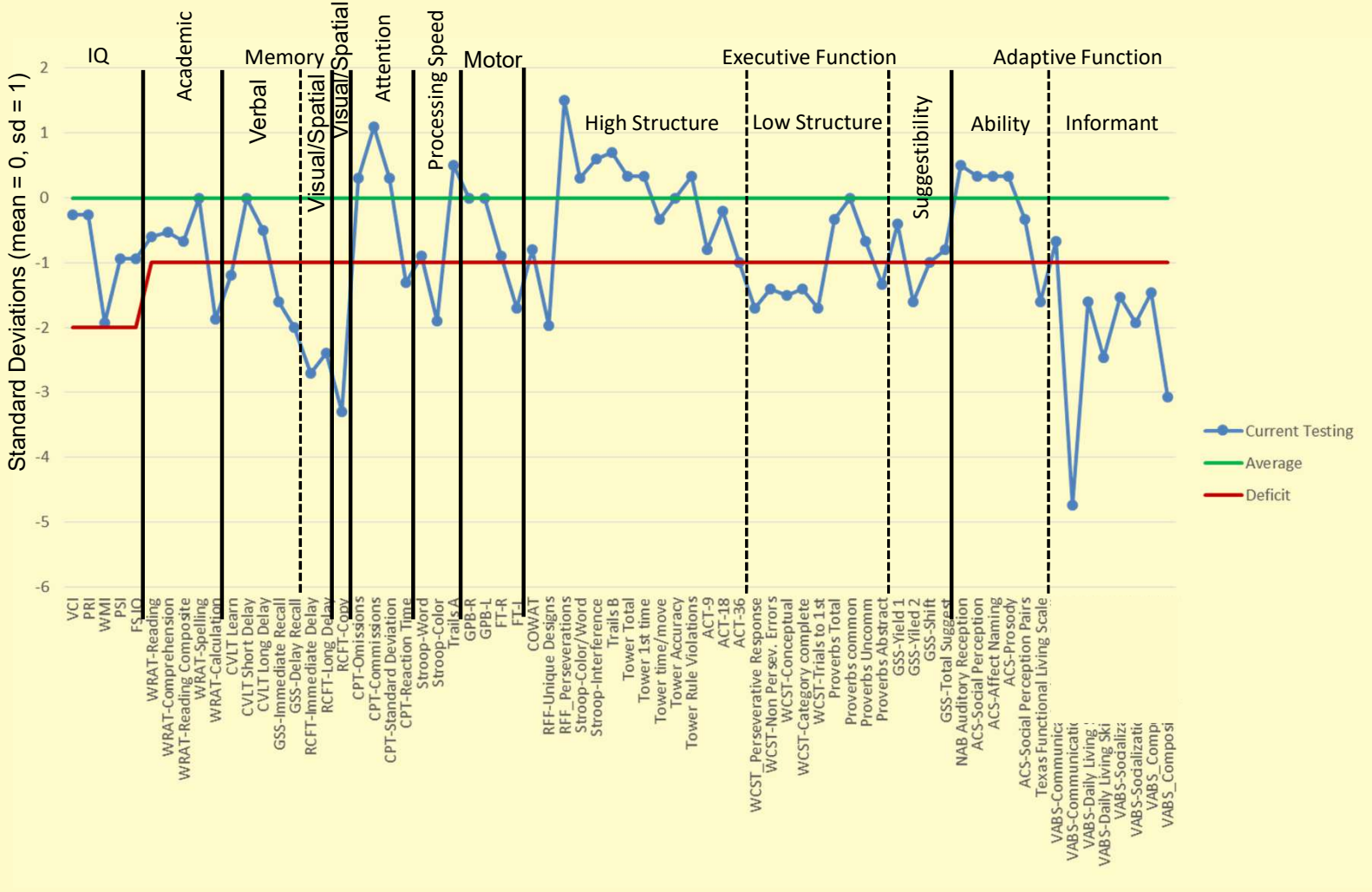
- Rarely see IQ below 70
  - Often “split” between Verbal and Nonverbal
- “Patchy” (irregular) presentation rather than global or focal deficits
- Academic deficits especially in arithmetic
- Social/Adaptive functioning deficits
  - worse than expected based on IQ
- Executive function deficits
  - especially on low structure tasks
- Increased variability in performance

Effort Testing

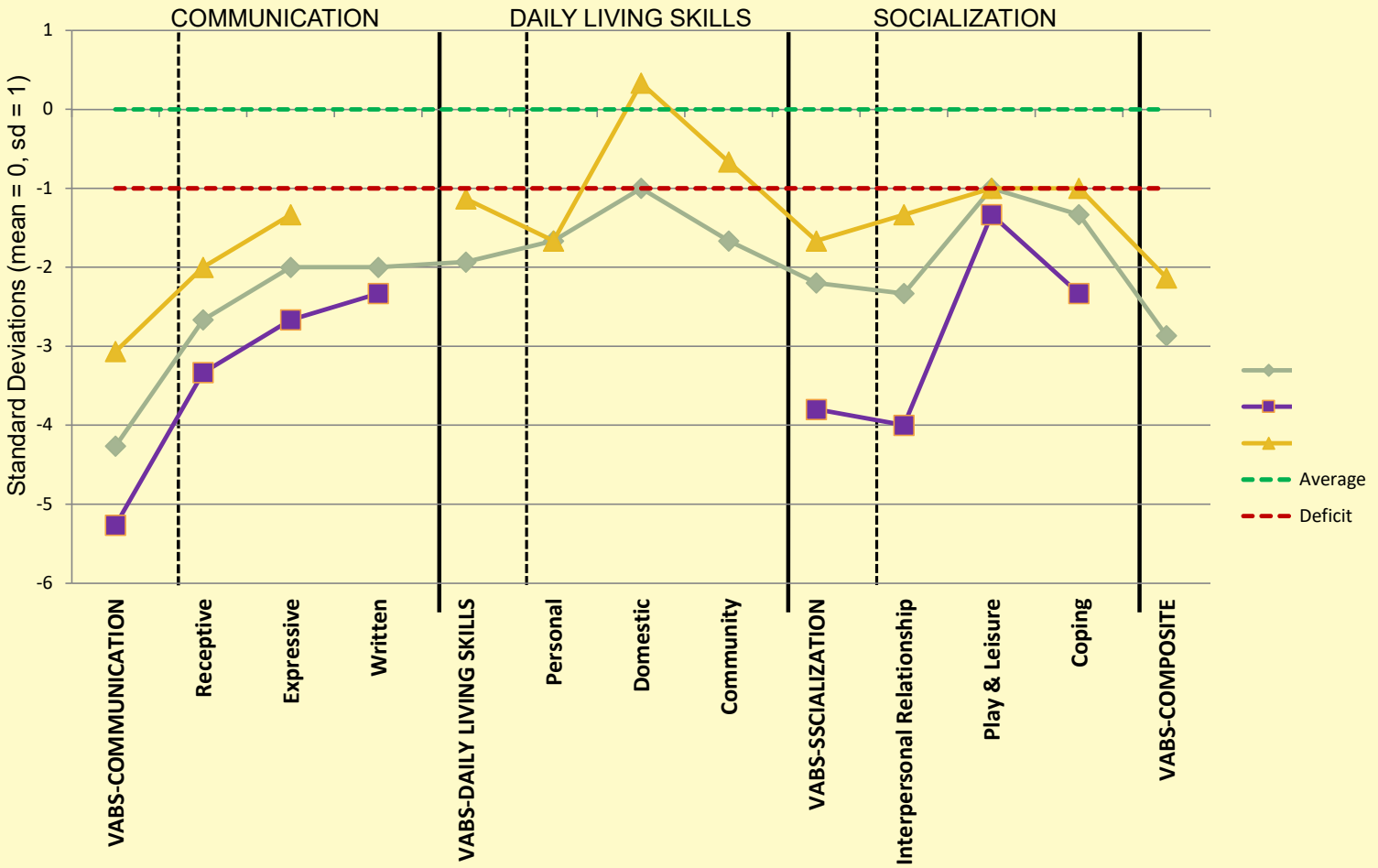
Task	Score	Good Effort?
Advanced Clinical Solutions (ACS)	**Word Choice = 49/50** **Reliable Digits = 7**	**YES**
Verbal Memory (CVLT)	**16/16**	**YES**
Conner's CPT	**Valid**	**YES**
Dot Counting Test	**E-Score = 8**	**YES**

Effort testing on second day of testing as well as behavioral observation during the assessment indicates that XXXX was putting out good effort.

Neuropsychological Profile

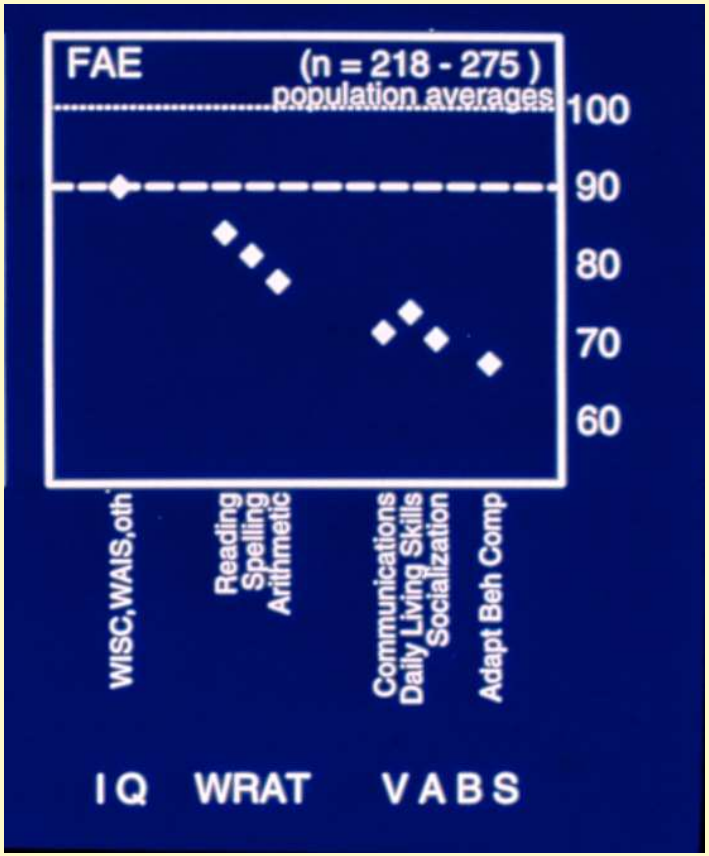


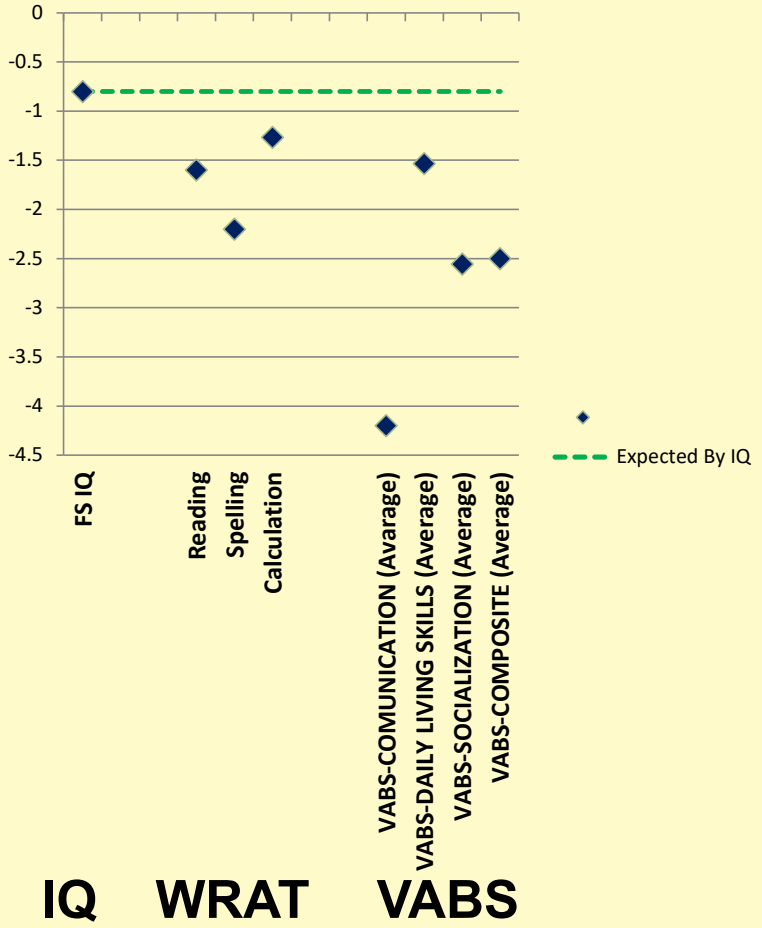
Consistency of Reports Across VABS



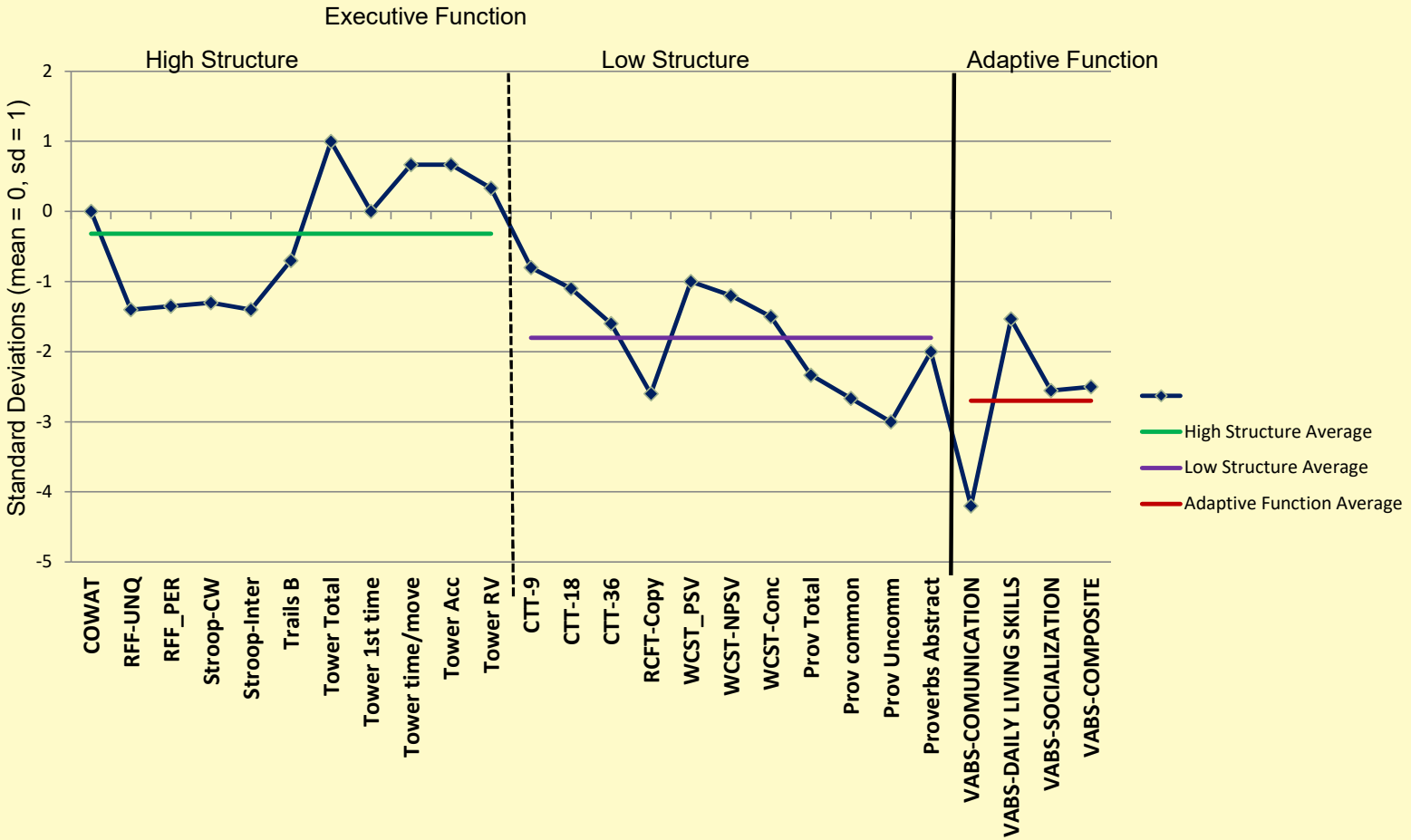
Functional Equivalent of a 12 ½ year old

Downward Slope and Severe Adaptive Deficits: Consistent with FASD





High vs Low Structure: Consistent with FASD



Comparison of QEEG and Neuropsychological Testing Results

- While neuropsychological testing could be impacted by a subject's effort, QEEG **IS NOT** affected by effort

Damaged Brain Regions per QEEG	Current Testing (z-scores)
Temporal Lobes & Parahippocampal Giri (auditory processing, short-term memory, receptive language, face recognition; creation of new memories, retrieval of short-term memory, attention control)	RBANS Immediate Memory = **-3.1** RBANS Delayed Memory = **-1.7** List Learning = **-2.3** List Retention = **-2.2** Story Learn = **-2.7** Story Retention = **-2.3** Visual Retention = **-2.3** NAB: Auditory Comprehension = **-3.1** WAIS VCI = **-2**
Bilateral Parietal Lobes (visual-spatial processing, short-term memory, executive attention, receptive language, awareness of emotional expression in others)	RBANS Figure Copy = **-3** RBANS Figure Retention = **-2.3** RBANS Line Orientation = **-2.2** Trails A = **-2.9** Trails B = **-4.4** NAB Auditory Comprehension = **-3.1** WAIS WMI = **-2.1** WAIS PRI = **-2.2** WRAT Reading Comprehension = **-2.2**
Occipital Lobes (visual perception and spatial processing)	RBANS Line Orientation = **-2.2** Trails A = **-2.9** Stroop Word Reading = **-2.8** Stroop Color Naming = **-3.2** WAIS PSI = **-2.5** WAIS PRI = **-2.2**

Damaged Brain Regions per QEEG	Current Testing (z-scores)
Anterior Cingulate (volitional motor control, autonomic regulation, reward anticipation, error detection, attention, empathy, decision making and impulse control)	RBANS Attention = **-3.8** CPT Omissions = -0.7 CPT Commissions = **-2.3** Stroop Interference = **-2.1 with 3 errors**
Bilateral Frontal Lobes (impulse control, executive functioning, abstract thinking, mood and social skills)	Grooved Pegboard (R) = **-3.5** Grooved Pegboard (L) = **DC** RBANS Language = **-1.7** WRAT Word Reading = **-2.1** COWAT Letter Fluency = **-2.7** COWAT Animal Naming = **-2.6** Stroop Interference = **-2.1 with 3 errors** Trails B = **-4.4** WCST: Perseverative Responses = **-2.7** Nonperseverative Errors = -0.8 Conceptual Responses = **-1.6** Categories Completed = **~-1.7** Set Loss = **~-1.4** DKEFS 20 Questions: Initial Abstraction = **-2** Achievement = **-1.7**

IN SUMMARY

Multiple deficits across NINE neuropsychological domains

- Academics especially in math calculation
- Learning and memory for verbal and visual information
- Visuospatial construction and organization
- Attention functioning
- Processing speed
- Executive functions especially on tasks where there was less external structure
- Communication skills (based on direct testing of expressive communication and two of the three informants)
- Daily living skills (found on both ability testing and informant reports)
- Socialization skills (based on informant reports)

Reflect significant functional disabilities.

- 40% of scores at least mildly impaired
- 28% of scores at least moderately impaired

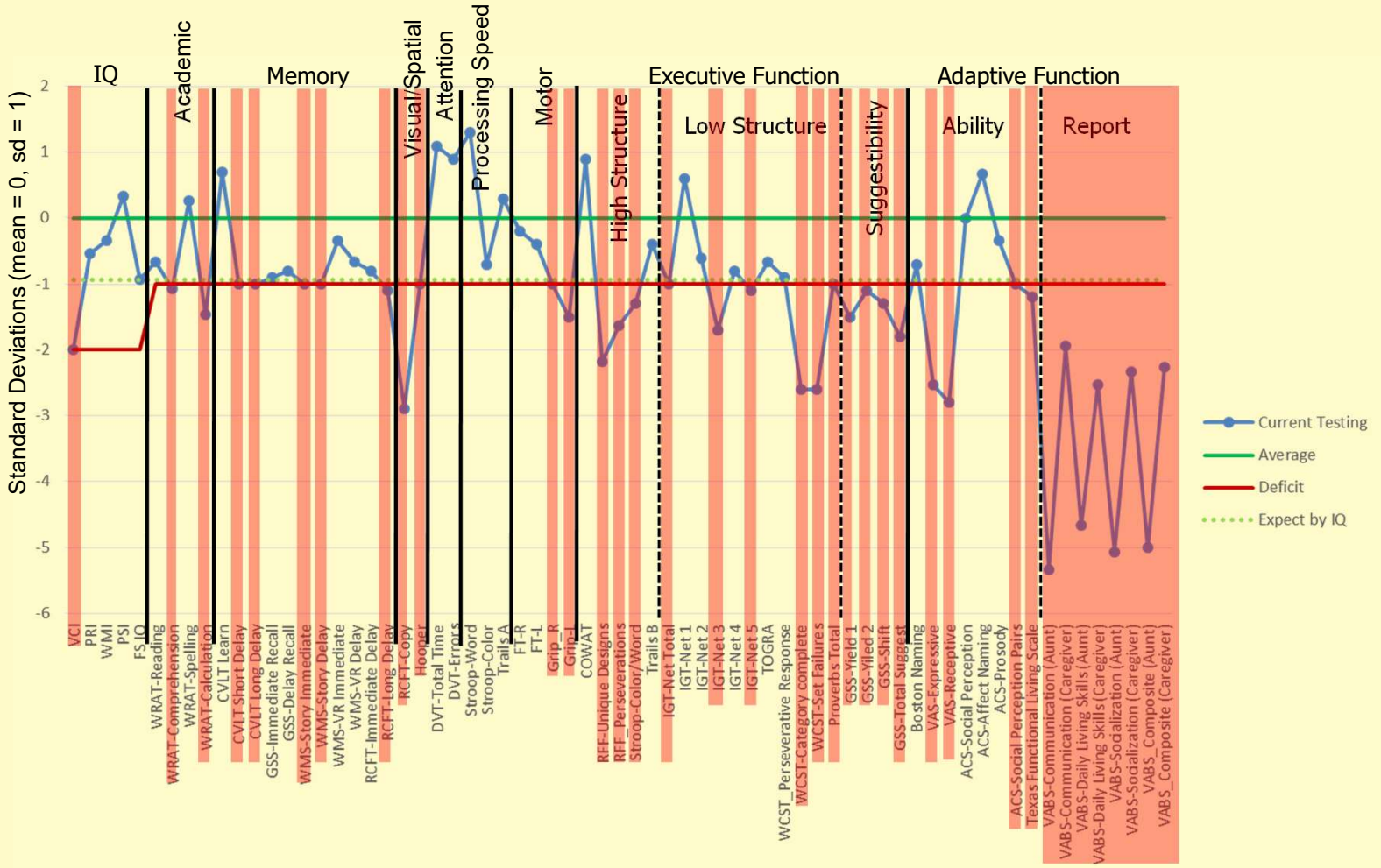
IN SUMMARY

- XXXX's pattern of functioning is most consistent with Neurodevelopmental Disorder associated with Prenatal Alcohol Exposure (ND-PAE) as identified in DSM-5.
- This would have been classified as Cognitive Disorder (Not Otherwise Specified) under the DSM-4.
- **Pattern & breadth of deficits is consistent with Alcohol-Related Neurodevelopmental Disorder (ARND) as diagnosed by Dr. YYYYY.**

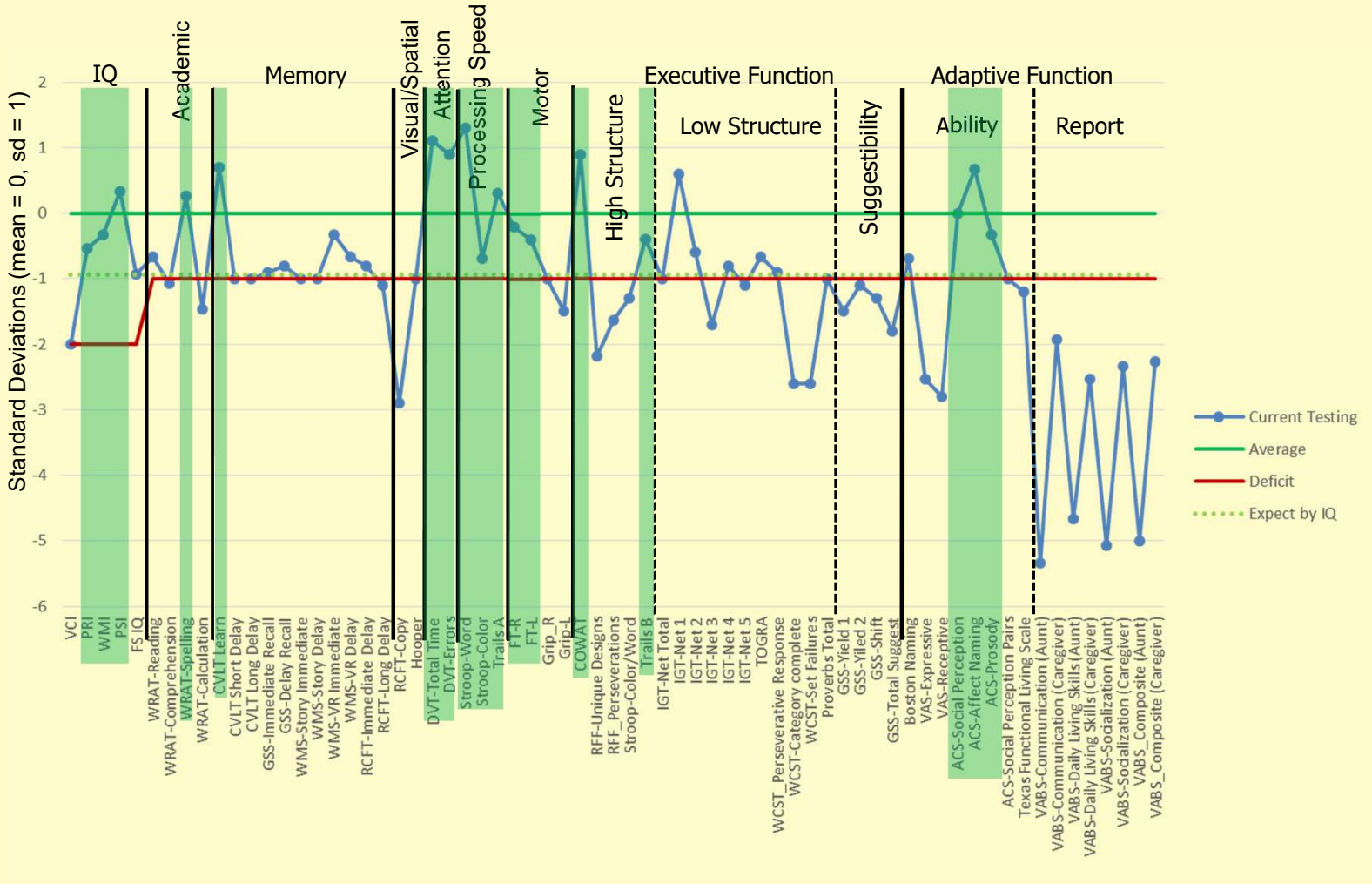
Neuropsychological Assessment when Diagnosing FASD

- Focus is on:
  - Establishing the individual's current pattern of cognitive impairments
  - Establishing a historical pattern of similar cognitive functioning
- These patterns of deficit are critical in rendering a diagnosis of an FASD

Focus on the Impairments



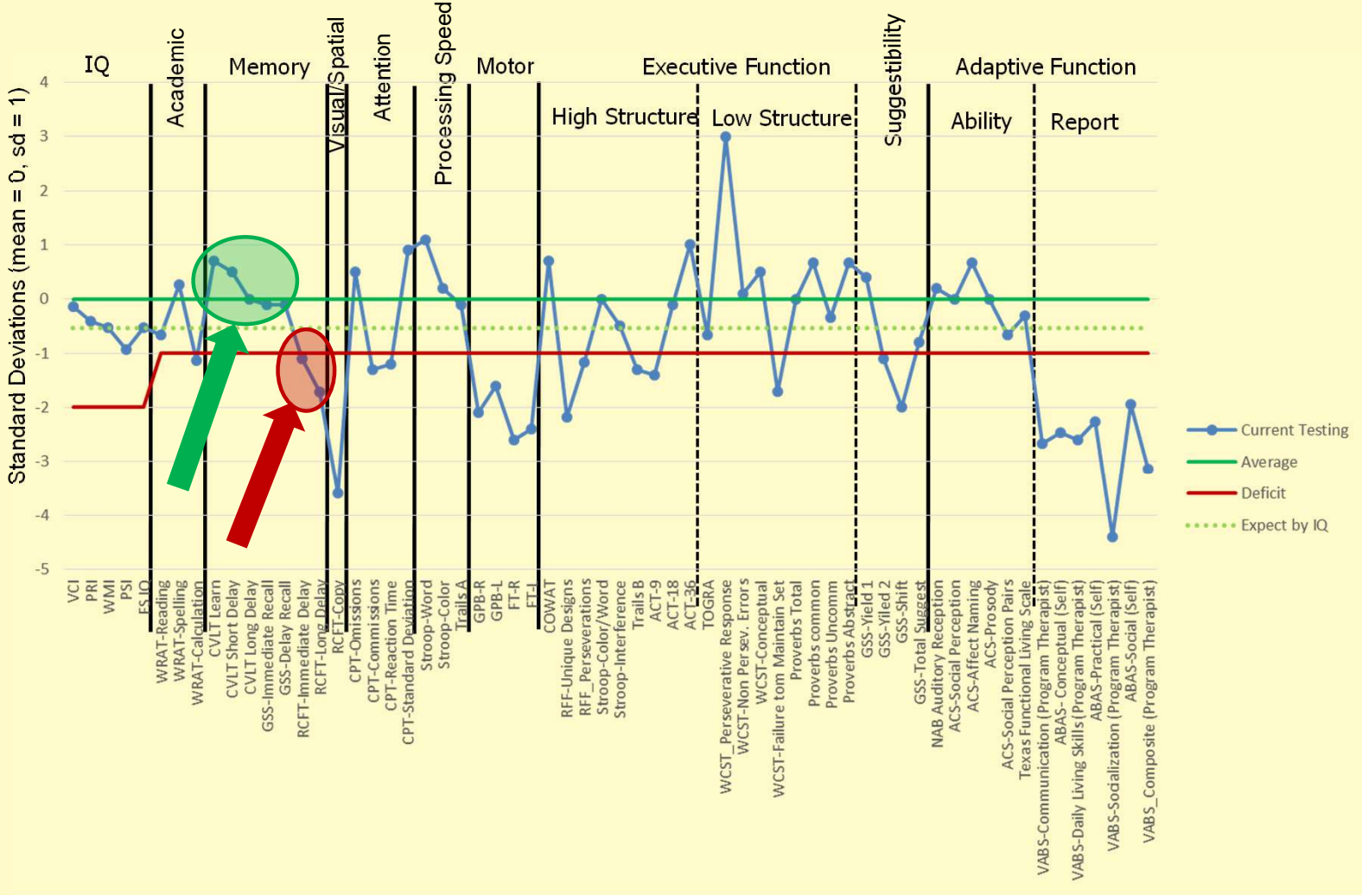
Focus on the Strengths



Use of Neuropsychological assessment to Guide Treatment

- The individual's pattern of neuropsychological functioning can also give ideas on how best to work with them therapeutically

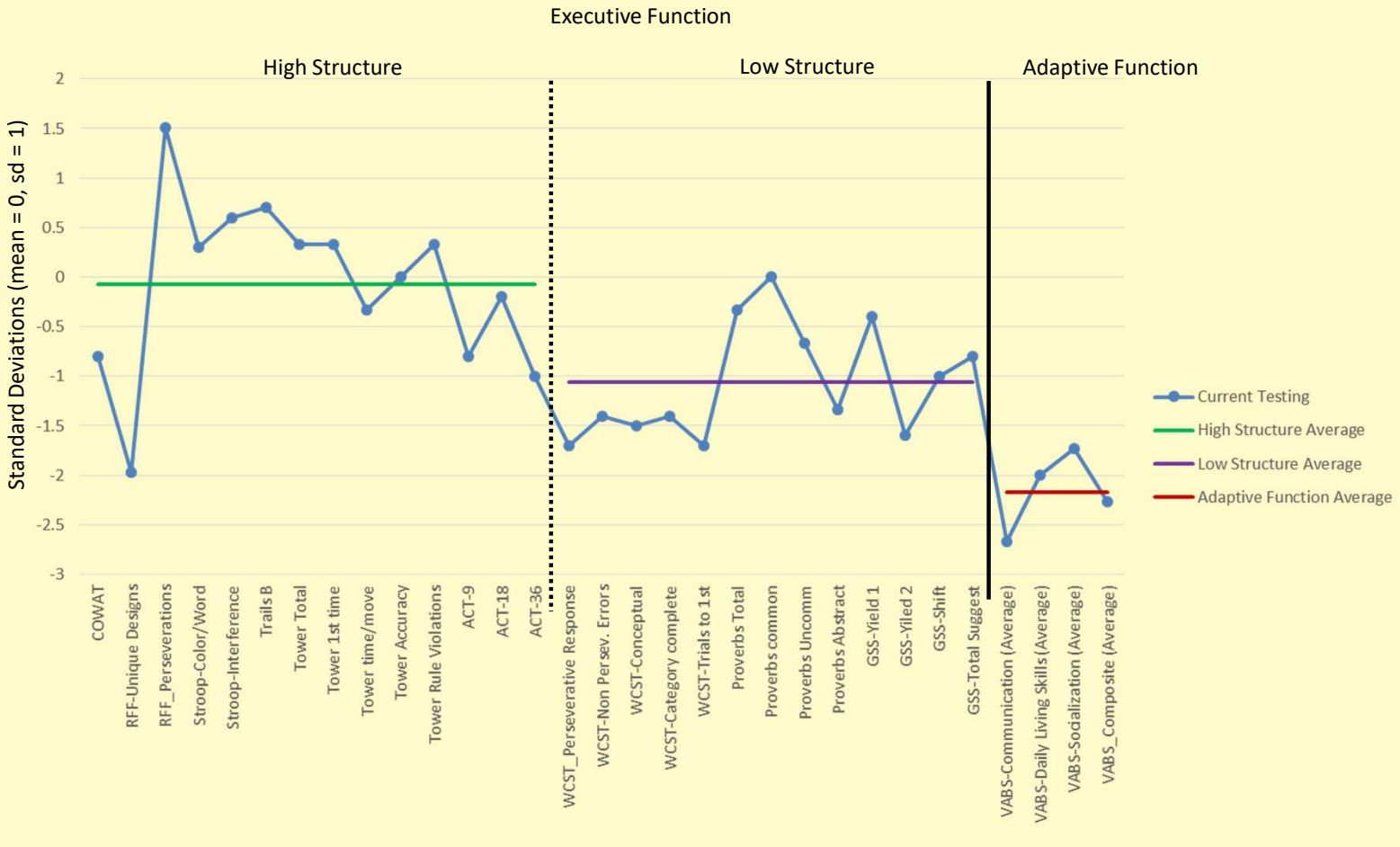
Better Language-Based Learning and Memory



Learning and Memory

- Differential learning/memory strengths
  - If verbal provide language based instruction
  - If visual, use pictographic cues and write down information
  - For both, role play and practice

Better on High Structure Tasks

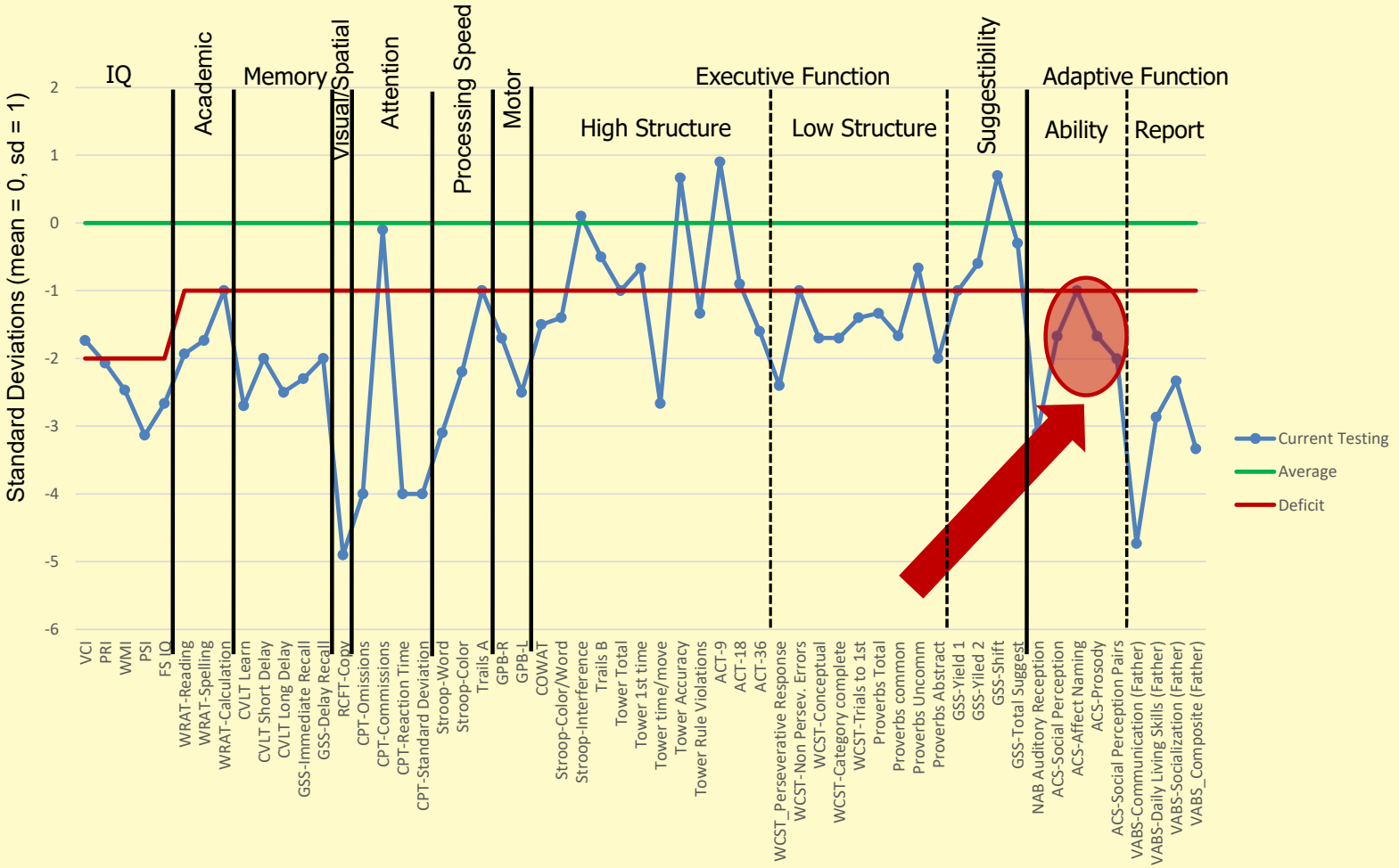


Does Better on High Structure Executive Functioning

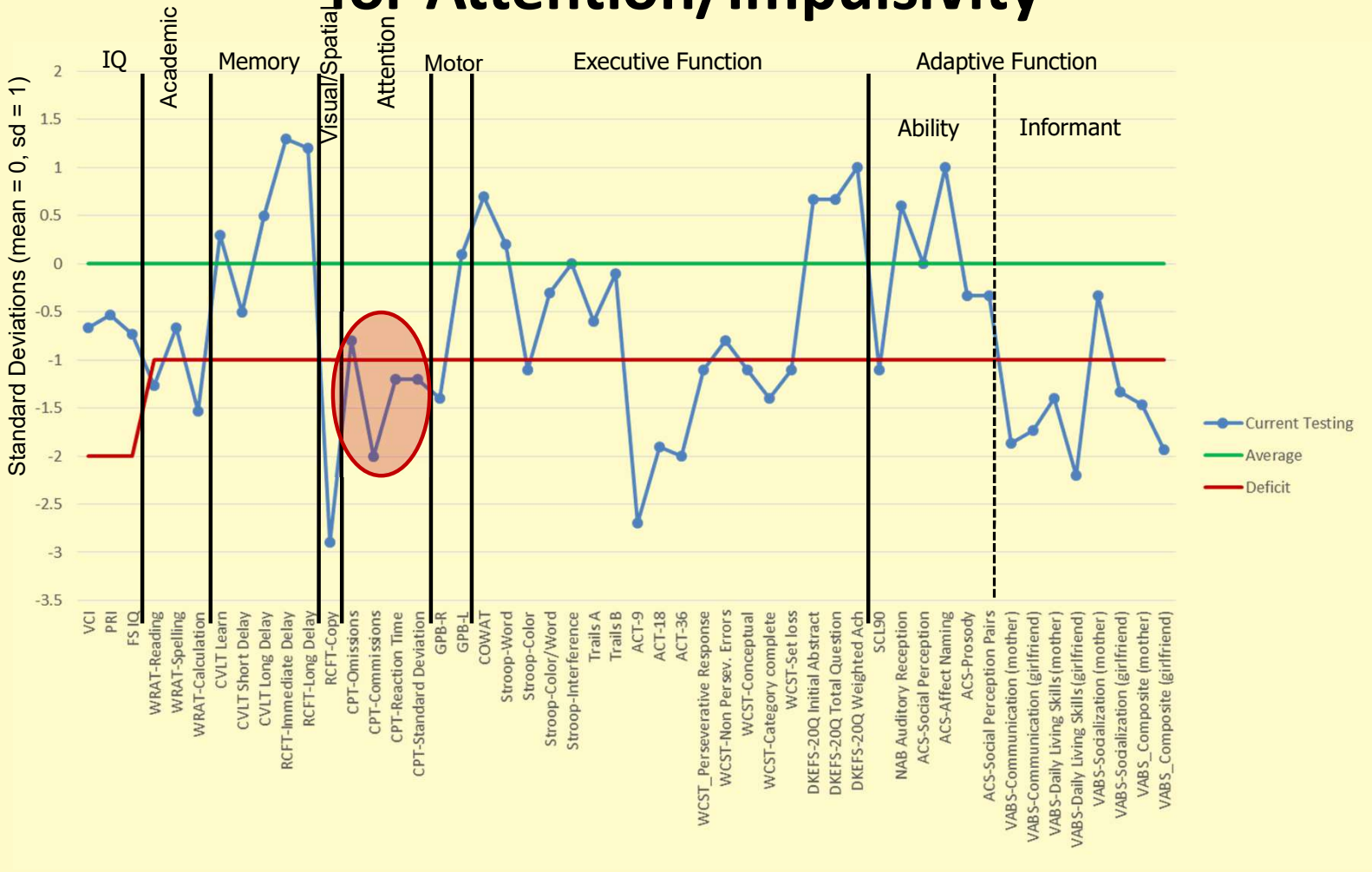
- When tasks are well structured and concrete, they can able to do better

Slow Processing Speed: Allow Extra Time

Difficulty Understanding Emotions



Potentially Benefit from Medications for Attention/Impulsivity



In Conclusion

- The neuropsychological evaluation provides more than just diagnostic information
- It can focus on both strengths AND weaknesses
- It can be used to help tailor treatment strategies
  - To maximize strengths
  - To minimize the impacts of weaknesses
- Neuropsychological assessment is a critical component of the FASD diagnostic process in forensic settings

Thank you!

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