Interpreting pediatric neuropsychological data: *curveballs & pitfalls*

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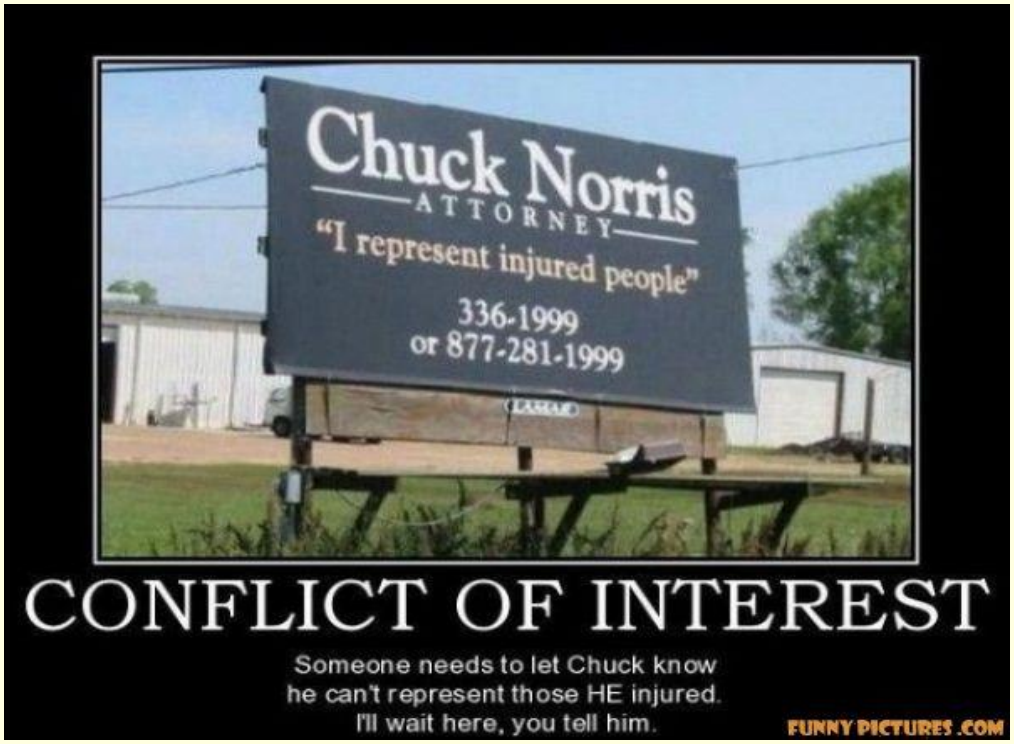
- Speaker has no conflict of interest to declare.



Objectives

- Appreciate the importance of school records in the evaluation of pediatric TBI.
- Understand why parent and adolescent self reports after pediatric TBI may differ.
- Describe ways to deal with boundaries on the scope of an evaluation.
- Consider methods of evaluating the relative impacts of multiple cerebral insults.

What happens in a neuropsych eval?

- Clear referral question
- Review of records
- Interview & history
- Observations
- Formal psychometric tests; *preferably with know validity in the condition of interest*
- Integration and interpretation
- Report

What should be in the report?

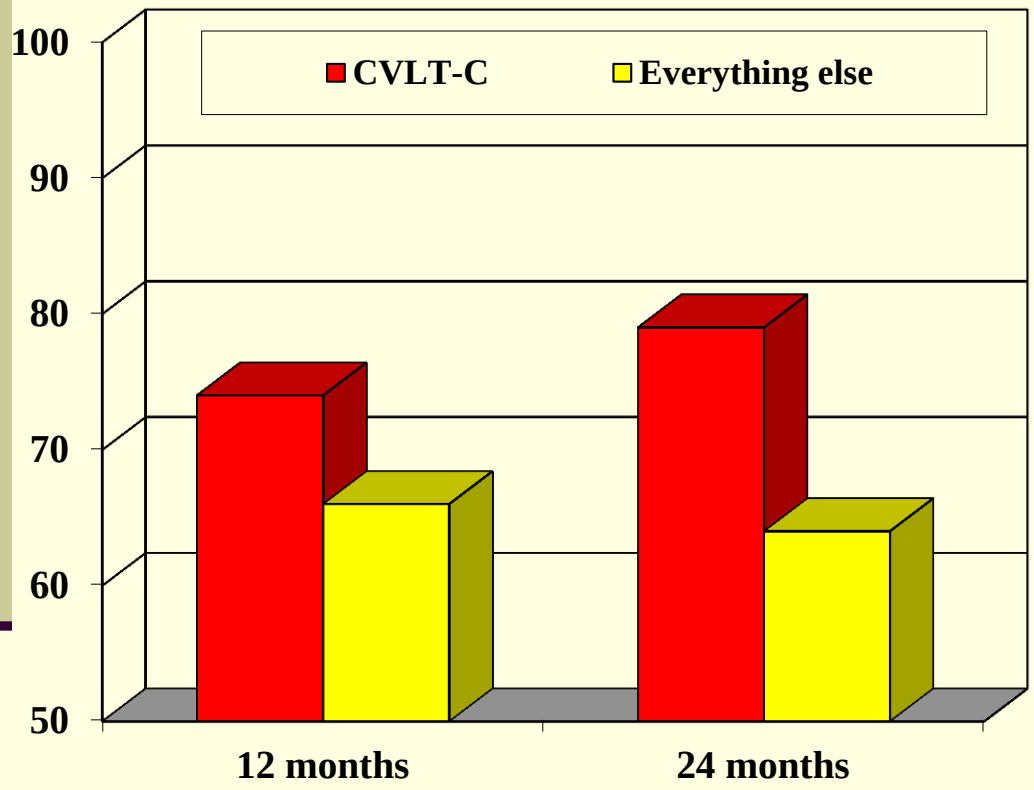
- Clear answer to the referral question that also highlights any new, *incremental* information.
- Succinct explanation of the foundation for the conclusions.
- Acknowledgement of any complicating factors.
- Feasible and pragmatic recommendations.
- Follow-up plan.

Example of a valid test

California Verbal Learning Test for Children*

- Confirmatory factor analysis for construct validity in children with TBI (Mottram & Donders, *Psychological Assessment*, 2005).
- Strong correlations with measures of injury severity suggest criterion validity (Donders & Nesbit-Greene, *Assessment*, 2004).
- Evidence for incremental validity in the prediction of long-term outcome (Miller & Donders, *Rehabilitation Psychology*, 2003).
- * No, I do not get kickbacks from Pearson for this!

Prediction of long-term special education placement after TBI



- CVLT-C is about 4/5 accurate at 24 months, compared to about 2/3 for all demographic and neurological variables combined, so it actually improves prediction.

But what if…..

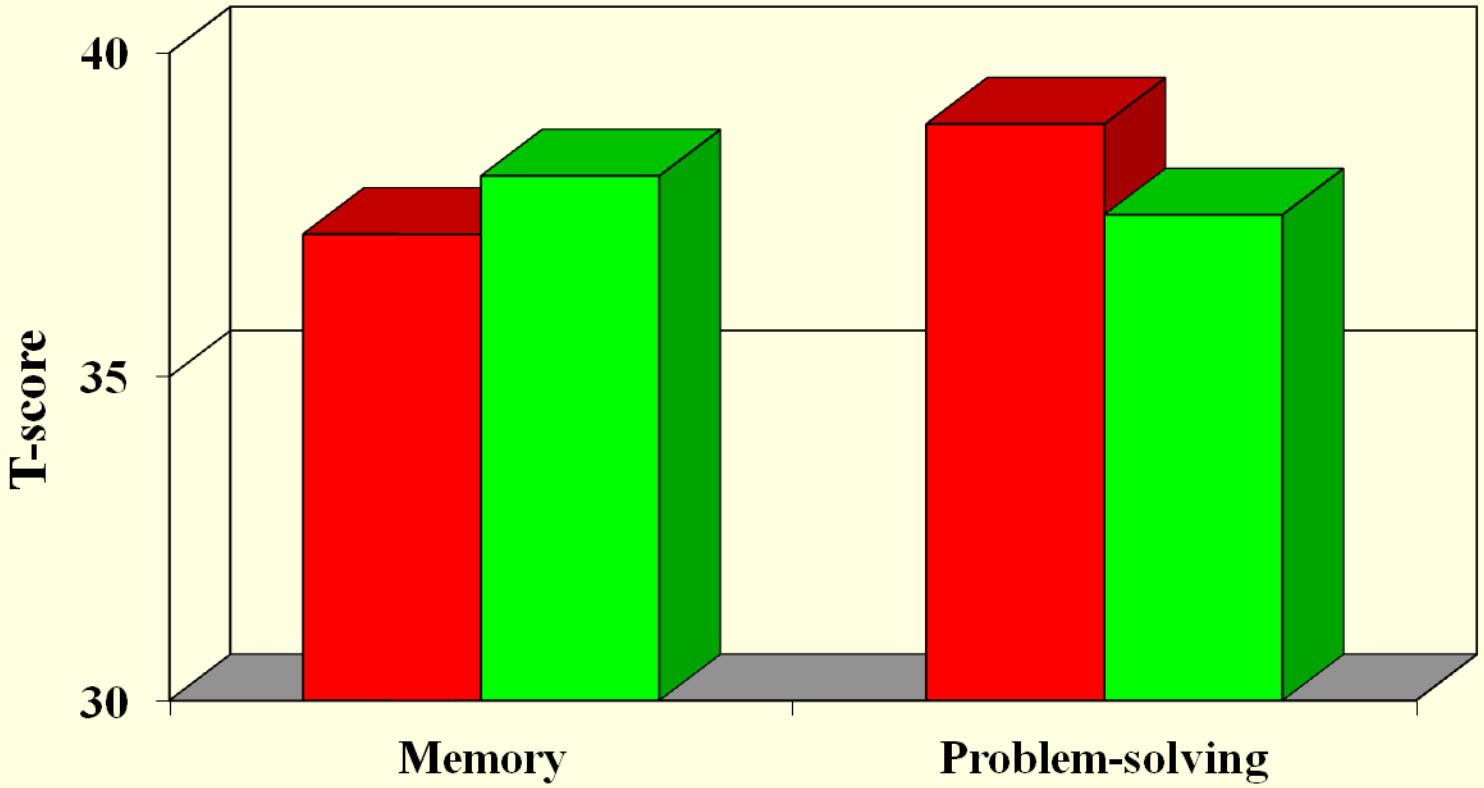
- Child is seen during the summer, and premorbid school records are not available.
- Child and parent disagree strongly about the degree of any problems.
- In a legal case, the attorney advises family not to discuss specific issues.
- There is more than one serious medical problem to account for.

Where are those records?

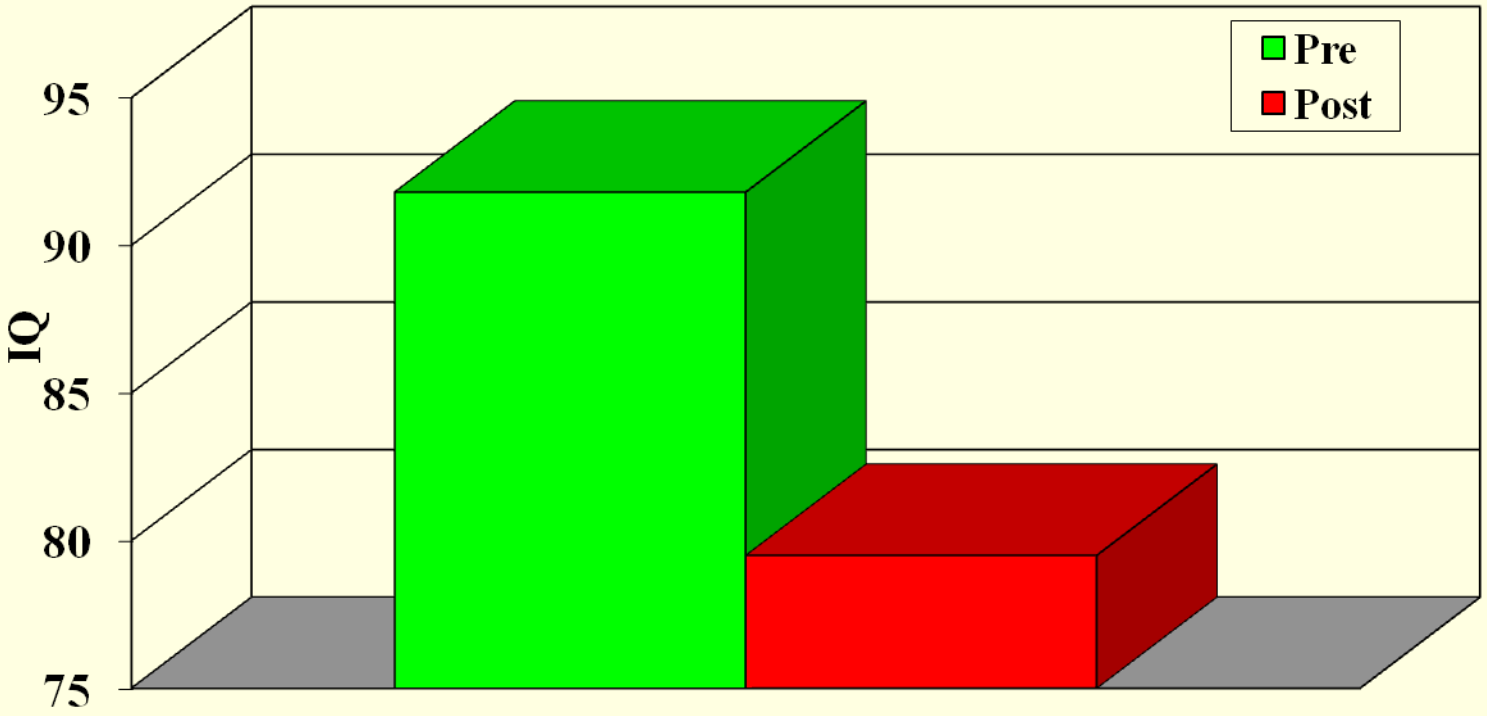
(And who needs them, anyway?

Without school records:

(adapted from Donders & Strom, *JHTR*, 2000):

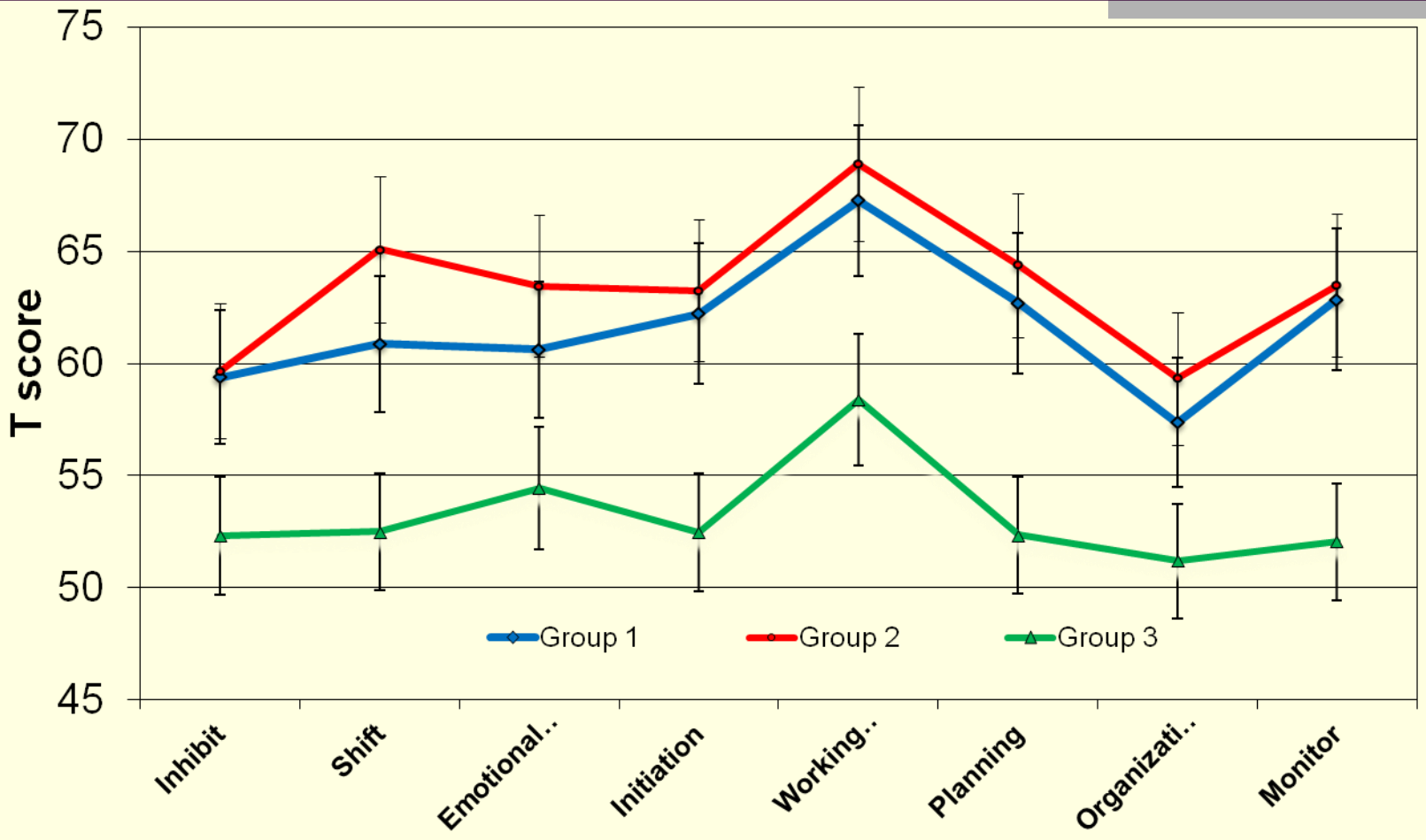


But if you actually get those records:

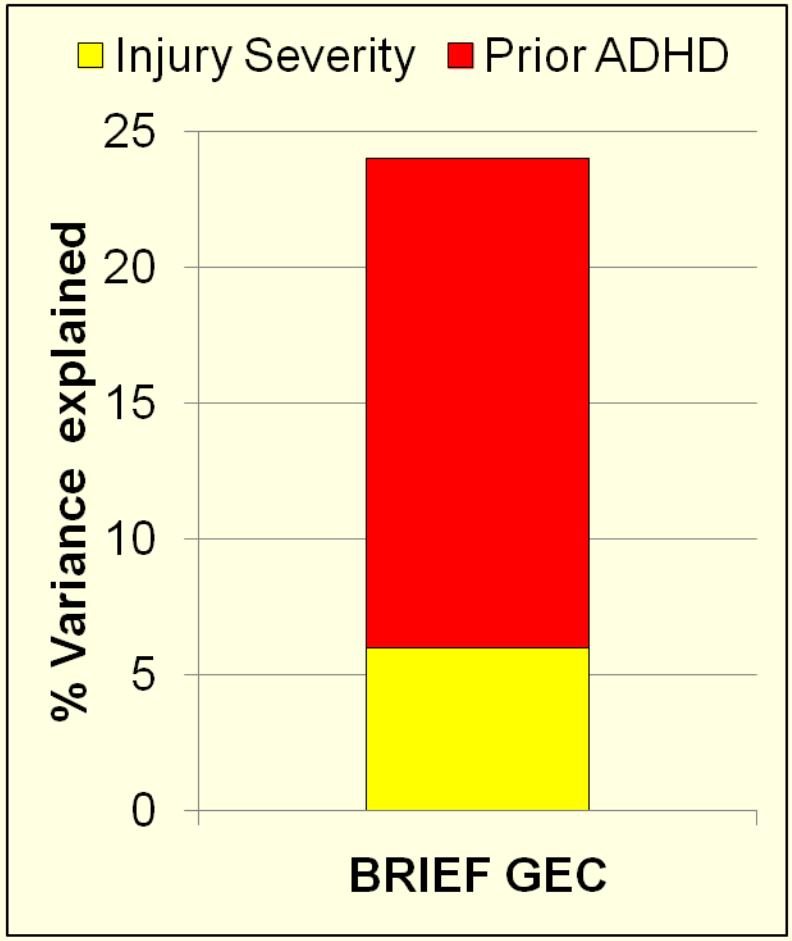


Another example: Who is where?

(adapted from Donders et al., *J Neuropsych*, 2010)



The importance of prior history



- In 100 children with TBI, injury severity + prior ADHD history together explained 24% of the variance.
- Premorbid ADHD had a stronger impact than length of coma or diffuse lesion on imaging.

So the lesson learned is:

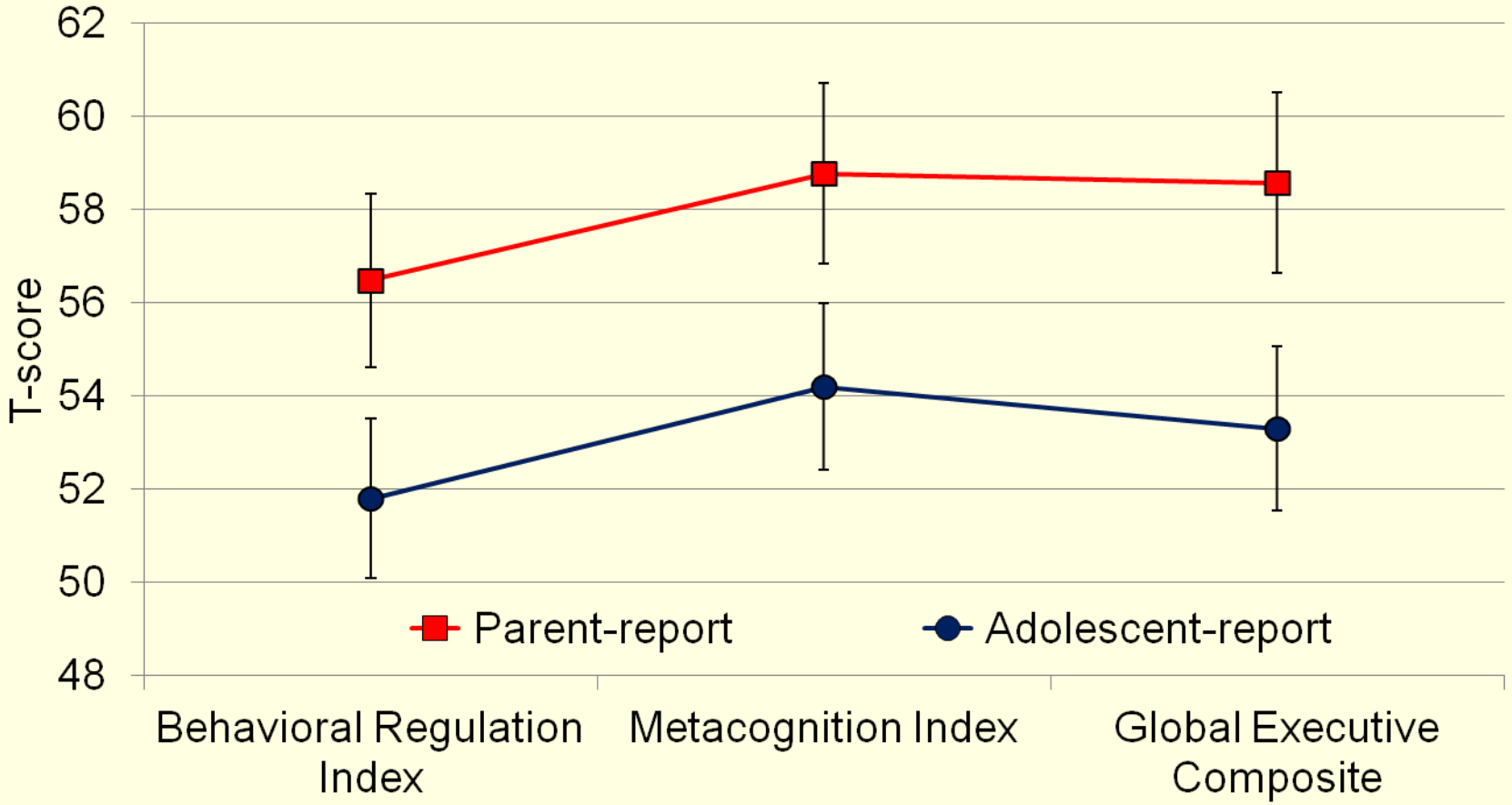
- The neuropsychologist should:
  - Always take a thorough history.
  - Always request school records.
  - If he/she cannot get those records, must indicate how this limits the conclusions.
- It can be helpful to get collateral information from an unbiased source.
- Beware of the ivory-tower know-it-alls.

Yeah, whatever…

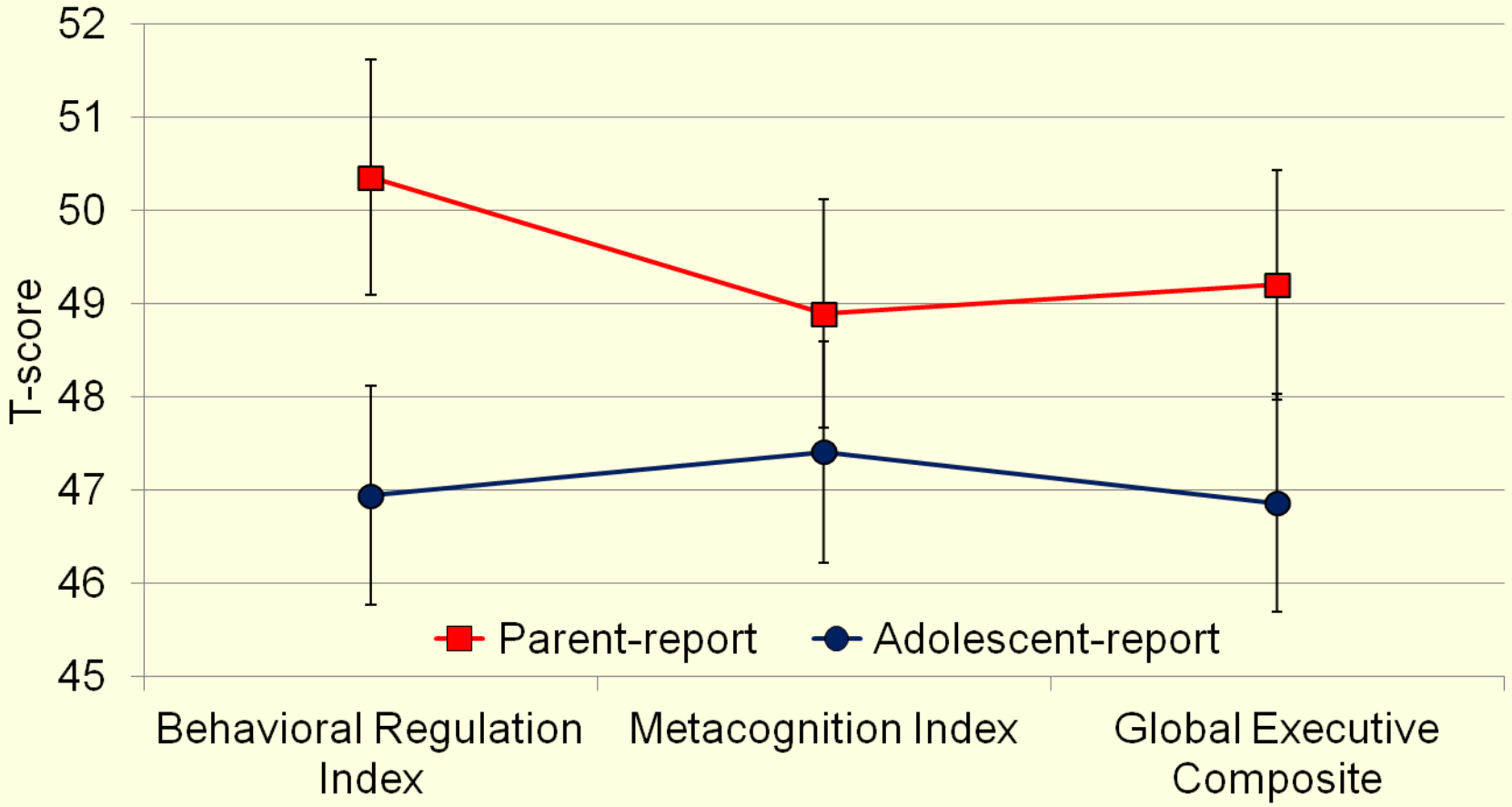
(who do you believe, after adolescent TBI?)

He says, she says… (TBI)

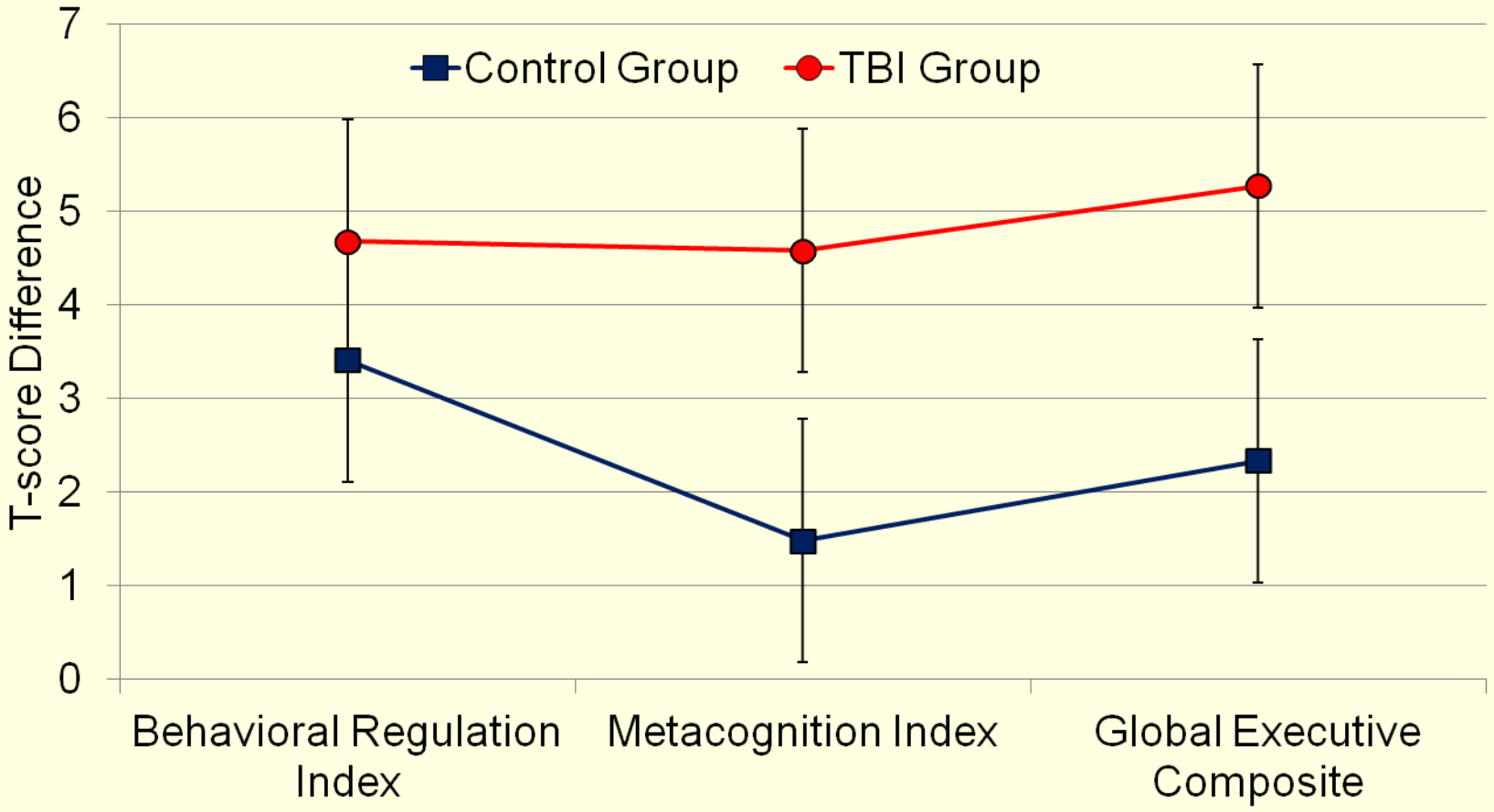
(adapted from Wilson et al., *Rehab Psych*, 2010)



More of that (in healthy controls)



But here is the kicker:

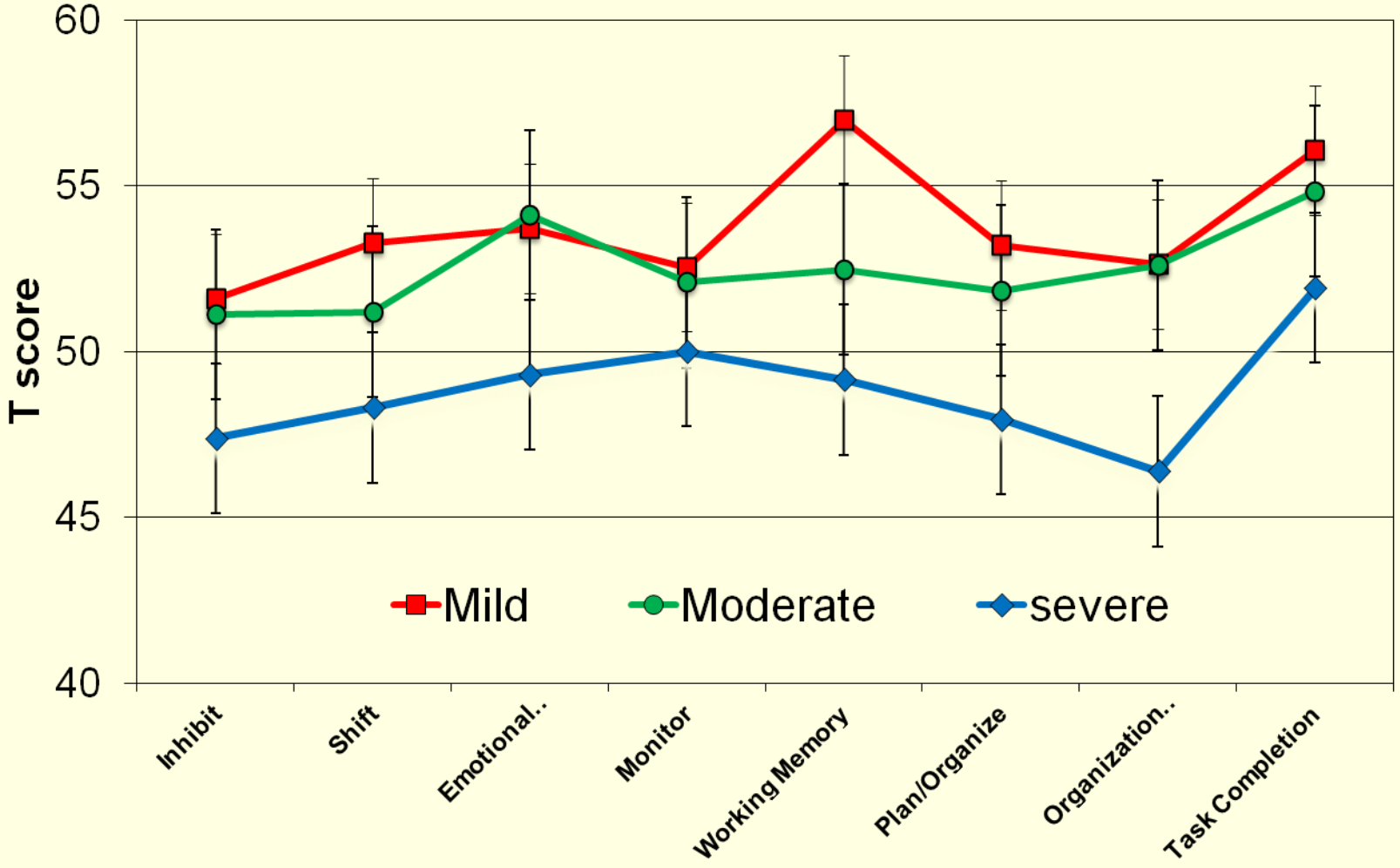


What does this suggest?

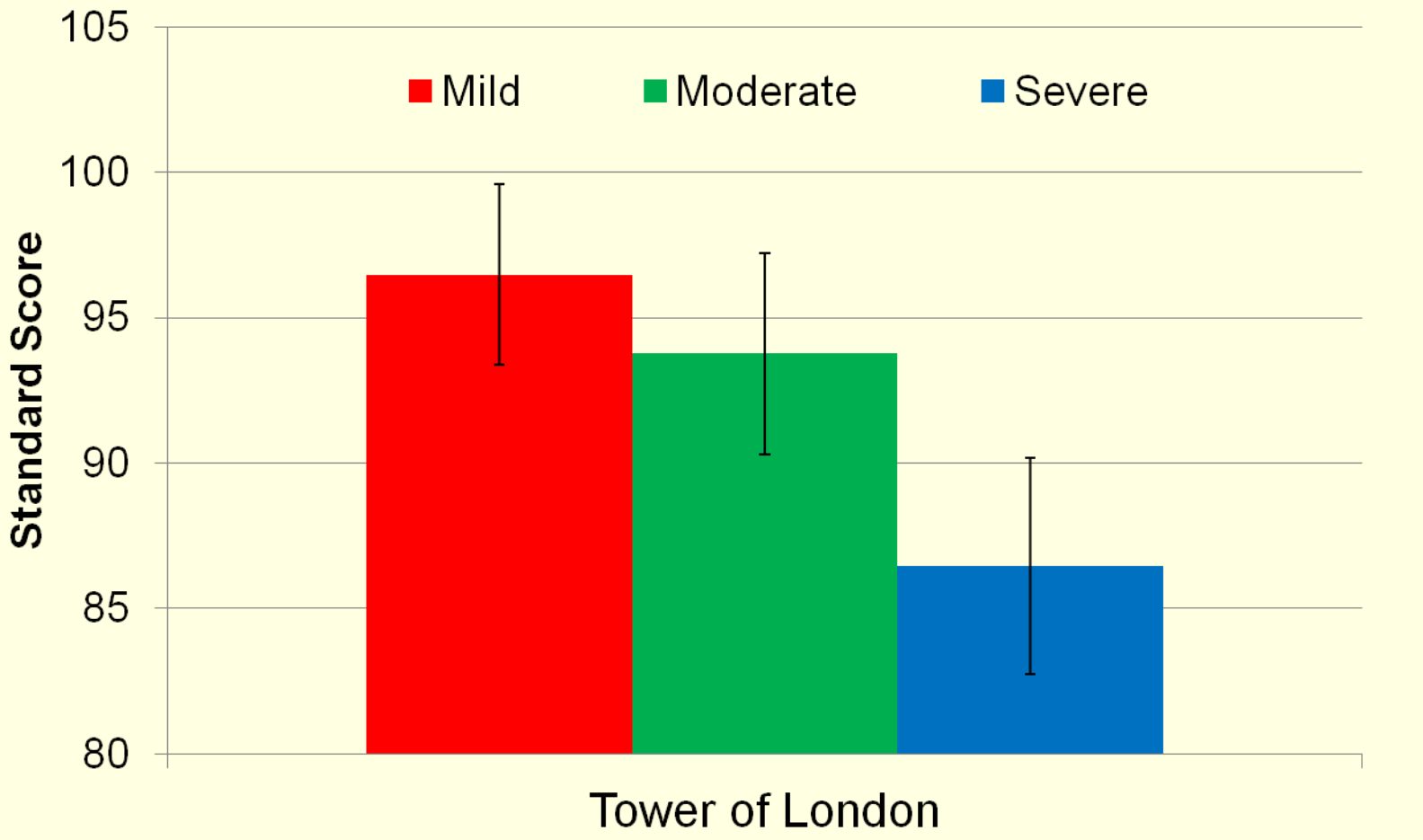
- It is important to obtain standardized input from both the parent and the child, whenever possible, after TBI.
- It is possible that adolescents with TBI under-report deficits after TBI, or that parents over-report them.
- There is a way to sort this out.

Self ratings on BRIEF after TBI

(adapted from Byerley et al., *in press*)



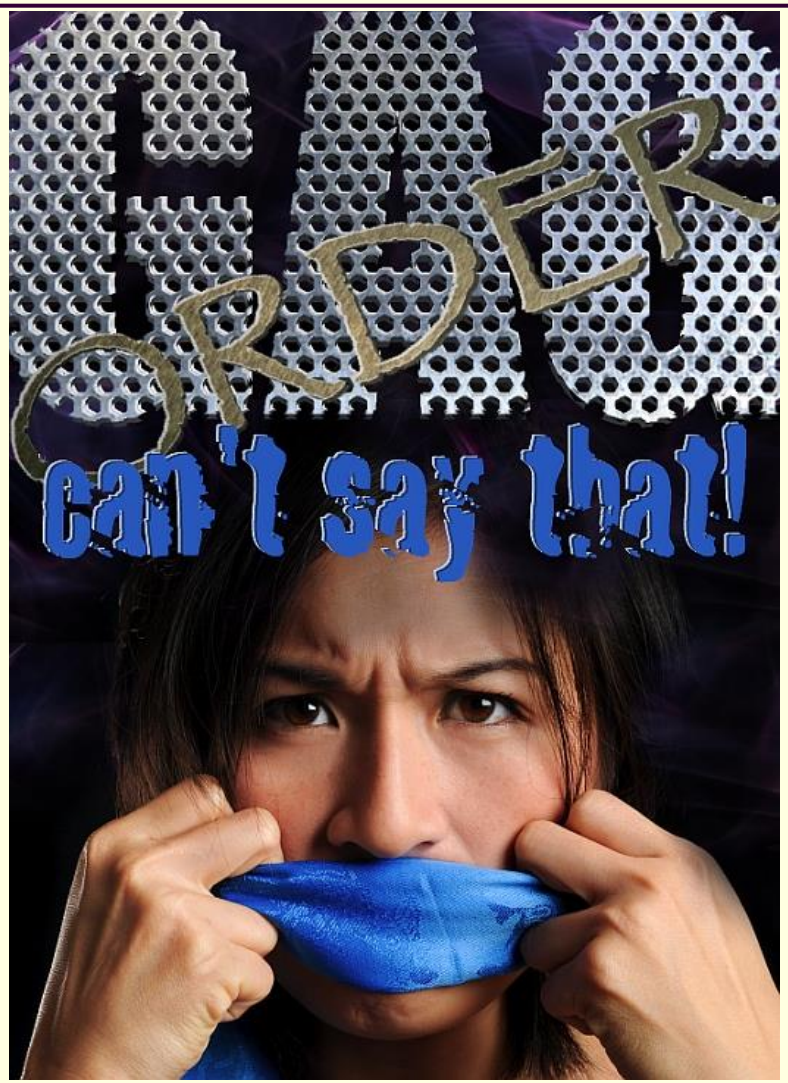
Whereas at the same time…



So we find that after TBI:

- With greater injury severity:
  - Adolescents perform worse on laboratory tests of executive functioning.
  - Their parents also rate them as having more problems in daily life.
  - But the adolescents still report fewer problems.
- This likely reflect organic-based lack of deficit awareness on the side of the adolescents.

What if the parents are not talking?



Lead poisoning case

- Child has well-documented lead levels in the upper teens and mid twenties over 2 years.
- Current test results suggest mild deficits in working memory and processing speed.
- Available medical records include references to learning disability in other family members.

What should the doctor do?

- Interview the parents about their own medical and developmental history.
- Get information on the psychological functioning of siblings who were not exposed to lead.
- That all sounds very reasonable but what if the parents' legal counsel objects to this and the judge agrees?

Potential solutions

- Decline to take the case.
- Roll the dice,

  and assume that the

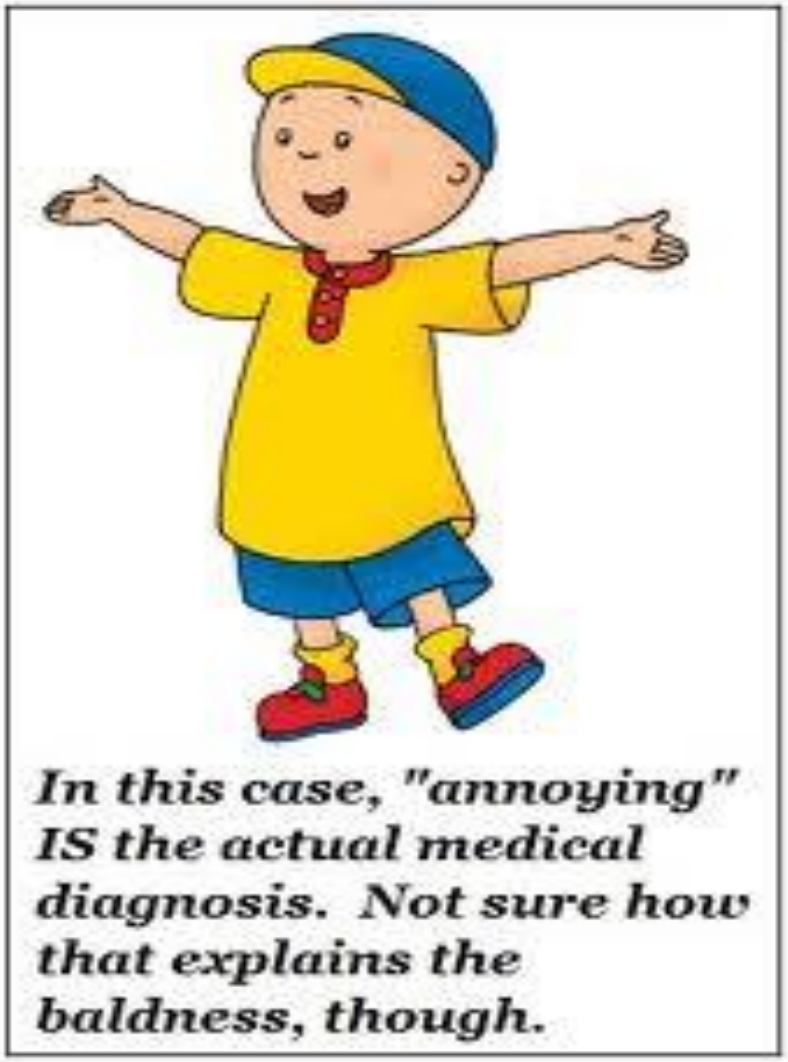
  levels are high enough

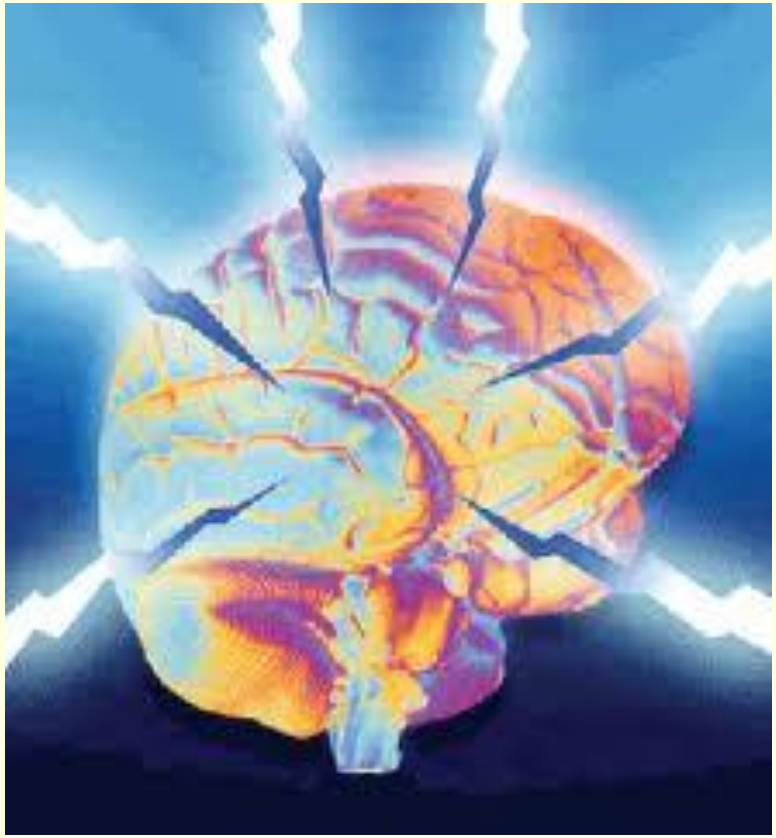
  to cause deficits in and by themselves.

- Describe the deficits but clarify that as long as the history is incomplete, causal attributions cannot be made.

What if there's a double whammy?

(And how do you account for both?)

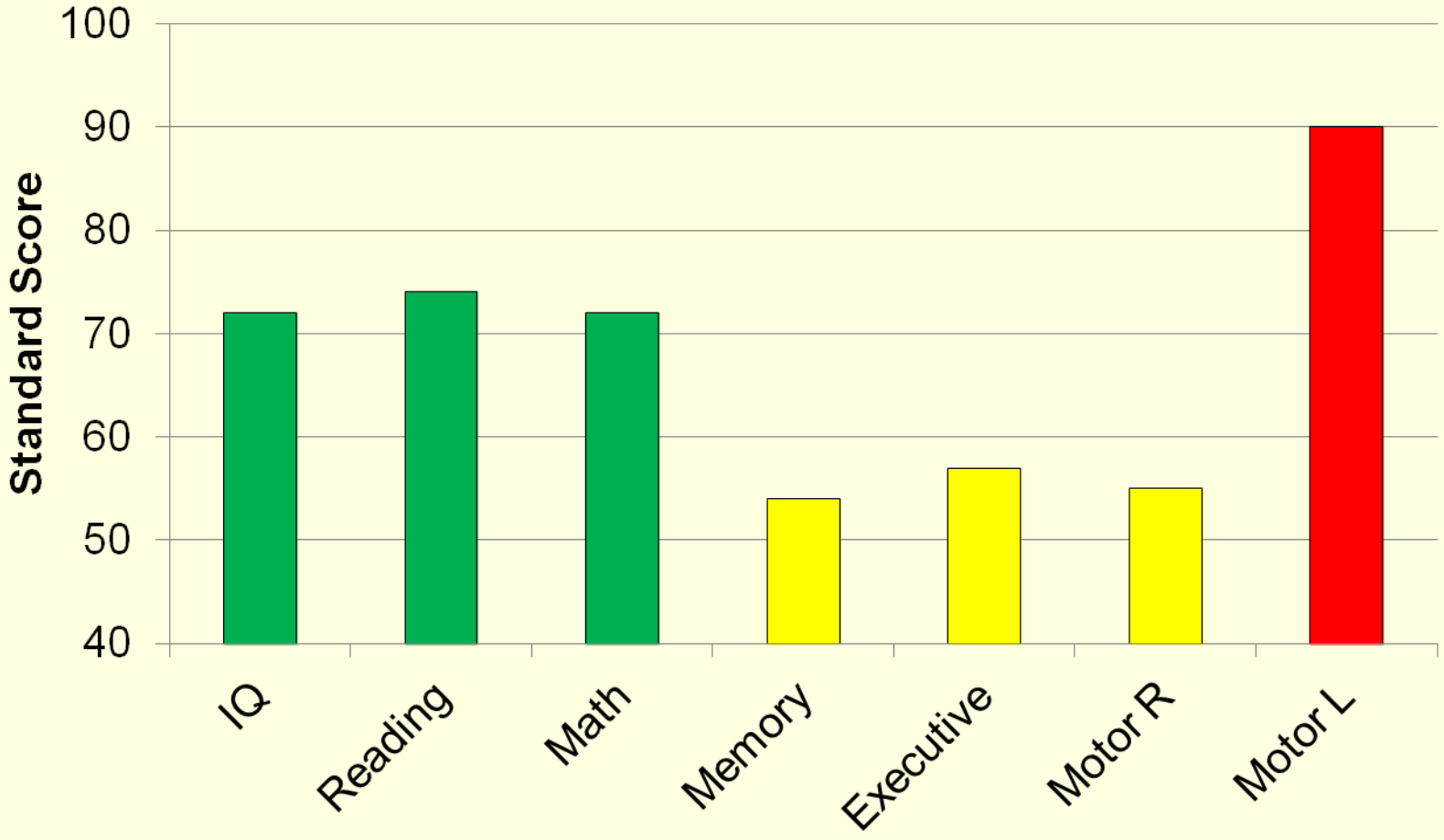




Case study (see chapter 9 in Sherman & Brooks' *Pediatric Forensic Neuropsychology*)

- A-A female, seen at age 16 years in context of lawsuit over lead poisoning.
- Normal development prior to age of 3 years.
- Lead poisoning between ages of 3 and 5 years; levels 18 – 34 µg/dl.
- Struck by a car at the age of 8 years.
- CT scan revealed left frontal hemorrhagic contusion; no prolonged coma.

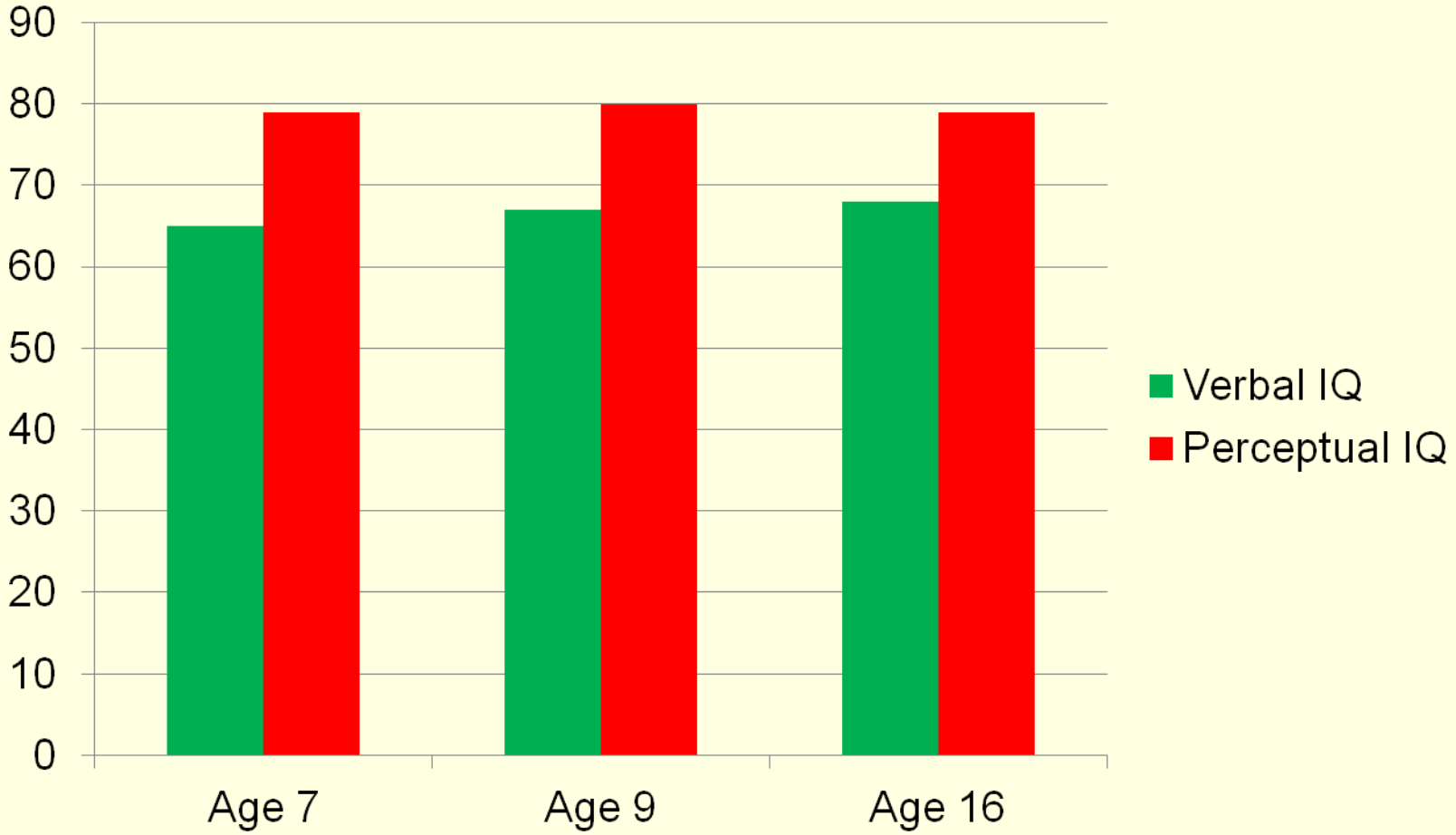
Neuropsych results at age 16 years



So far, we know that:

- There are deficits in memory and executive functioning that seem to be beyond what could be expected on the basis of borderline intelligence alone.
- The selective impairment of sensory-motor functioning in the right hand *could* be compatible with the known CT findings.
- But does that mean it is all due to the TBI?

And then there were school records…



So, it looks like:

- IQ scores were already well below average before the TBI at age 8, and remained stable after that, at both age 9 and age 16.
- The most likely interpretation is that:
  - Early lead exposure lead to some general cognitive limitation.
  - A further exacerbation in selective areas resulted from the TBI.

Conclusions

- A good neuropsychological evaluation must:
  - Include a comprehensive review of the child's and family's history, both pre and post the event in question.
  - Carefully consider the impact of premorbid and comorbid complicating factors.
  - Note any limitations that affect the confidence in any causal attributions.
- And don't forget about base rate issues…

What do you want to do?