Caveat

- The authors didn’t, and continue to know squat about CHC theory. We were simply looking for a more logical and user friendly way to communicate the results of our assessment to staff, parent, and student.

Rationale for approach

- Is there a more logical approach to explaining why a student qualifies or doesn’t qualify for special ed as SLD, than the current model which relies on a regression table cut score?
Step 1: Generating hypotheses from existing data

- Which broad cognitive abilities might be holding the student back from being successful? These are the weaknesses
- Which broad cognitive abilities have been spared? These are the strengths

Hypothesizing Broad Cognitive Ability Strengths and Weaknesses

Hypothesis-generating questions

- Is Joey able to show you that he is understanding what is being asked of him? Gc
- Does Joey seem to process questions and information in a timely fashion? Do you have to wait very long for answers? Gs/Gt
- If exposed to information once, does he seem to retain the information? What if he is repeatedly exposed to the information? Ssm/Gir
- Is Joey able to solve problems that are new to him? Gf
Hypothesis-generating questions
• Is Joey able to get his thoughts out on paper? Gv
• Does Joey seem to possess a solid vocabulary? Gc
• When faced with a problem, is Joey able to map out a strategy for success? Gv
• Is Joey able to recall what he just heard but not a week later? Glr
• Does Joey understand words with multiple meanings or idiomatic expressions? Gc

The Traditional PSW Approach
• Administer a standardized cognitive assessment in entirety
• Deduce potential areas of strength and weakness
• Validate with more subtests

In other words…
“Pissing in the wind and hoping it lands in right place.”

{A Brooklyn expression}
The Inductive/Deductive Approach

• Available data leads to hypothesis regarding PSW-Broad Cognitive Ability

Then identify a subtest battery in attempt to confirm the hypothesis.

Hypothetical case: Typical referral (elementary level)

• Student has decent basic reading skills (decoding) and fluency acceptable, but...
• Doesn’t seem to understand what he is reading and doesn’t do well when asked questions about what he just read

The logic behind the approach

• Of the nine typical reading abilities, there are four broad cognitive abilities that impact EITHER decoding or comprehension:
The logic of this approach

<table>
<thead>
<tr>
<th>Cognitive Ability</th>
<th>Correlates with...</th>
<th>Does NOT correlate with...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory Processing (Ga)</td>
<td>Basic Reading</td>
<td>Reading Comprehension</td>
</tr>
<tr>
<td>Processing Speed (Gs)</td>
<td>Basic Reading</td>
<td>Reading Comprehension</td>
</tr>
<tr>
<td>Visual Processing (Gv)</td>
<td>Basic Reading</td>
<td>Reading Comprehension</td>
</tr>
<tr>
<td>Fluid Reasoning (Gf)</td>
<td>Reading Comprehension</td>
<td>Basic Reading</td>
</tr>
</tbody>
</table>

Logic behind deductive approach: If comprehension suspect, then these should be relatively strong

- **Processing Speed (Gs)**
  - WISC-Coding; Symbol Search
  - KABC-time bonus (Pattern Reason)
- **Auditory Processing (Ga)**
  - WJ-Auditory Attention; Incomplete words
- **Visual Processing (Gv)**
  - KABC-Rover
  - WISC-Block Design

Logic of deductive approach: If comprehension weak then these should be relatively weak

- **Fluid Reasoning (Gf)**
  - KABC-Story Completion
  - WISC-Matrix Analogies
- **Short term memory (Gsm)**
  - WISC-Digit Span
  - KABC-Atlantis, Rebus
Real Case Time

- Let us introduce you to Joey, our case study for this approach

I. Problem Identification
(The Curious Case of Joey)

☐ Low productivity
☐ Long latencies (talking/writing)
☐ Frequently shuts down in the classroom
  - Very limited classroom participation
☐ Withdraws into reading or gaming
☐ Strong memory for high interest material

II. Problem Analysis
Predicting cognitive strengths

Given his apparent strength in reading comprehension, we predicted strong abilities with fluid reasoning (Gf) on the following subtests…
II. Problem Analysis: Predicting cognitive strengths

Given his apparent strength in math, (and his ability to recall correct algorithms without taking notes) we predicted strong abilities with Quantitative Knowledge (Gq) on the following subtests...

II. Problem Analysis: Predicting cognitive strengths

- Story Completion
- Matrix Reasoning
- Picture Concepts

II. Problem Analysis: Predicting cognitive strengths

- Arithmetic
- Rover
- Block Counting
II. Problem Analysis: Predicting Cognitive Strengths

- Joey is a strong auditory learner (even closes his eyes…we assume he’s not sleeping)
- Auditory Processing (Ga) — presumed strength
- Short-term Memory (Gsm) — presumed strength
- Long-term Memory (Glr) — presumed strength

II. Problem Analysis: Predicting cognitive strengths

KTEA
• Listening Comprehension

KABC
• Atlantis
• Rebus

KABC
• Atlantis Delayed
• Rebus Delayed

II. Problem Analysis: Predicting cognitive weakness

Given classroom data and observations, and a variety of assessments, we predicted lower performance levels with processing speed tasks (Gs).
II. Problem Analysis:
Predicting cognitive weakness

WISC IV
• Coding
• Symbol Search

KABC
• No time bonus on Story Completion

Interviews and observations revealed that JV processes and verbalizes ideas quickly when highly interested in the subject matter…
Dr. Who, Mine Craft, Cards Against Humanity

The hypothesis is now refined…

Refined hypothesis
Part I

• Slow processing speed → not global processing deficit
• Linked to writing or speaking only when he can’t rely on long term memory stores or high interest.
Refined Hypothesis
Part II

- Subtests that don’t require high level visual-motor integration (Symbol Search) will be stronger than those that do (Coding)

Additional Data Required

An additional research question:

*Does a scribe or keyboard increase Joey’s processing speed or ability to generate ideas as compared to handwritten work?*

<table>
<thead>
<tr>
<th>The Envelope please: III. Assessment</th>
<th>Predicted Area of Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognitive Ability</strong></td>
<td><strong>Reflected Skill</strong></td>
</tr>
<tr>
<td>Fluid Reasoning (Gf)</td>
<td>Reading Comprehension</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### III. Assessment

**Predicted Area of Strength**

<table>
<thead>
<tr>
<th>Cognitive Ability</th>
<th>Reflected Skill</th>
<th>Subtest(s)</th>
<th>Standard Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Knowledge (Gq)</td>
<td>Math calculation and problem solving</td>
<td>WISC Arithmetic</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KABC Rover</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KABC Block Counting</td>
<td>130</td>
</tr>
</tbody>
</table>

### III. Assessment

**Predicted Area of Strength**

<table>
<thead>
<tr>
<th>Cognitive Ability</th>
<th>Reflected Skill</th>
<th>Subtest(s)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory Processing/Ga</td>
<td>Listening Comprehension</td>
<td>Listening Comprehension (KTEA)</td>
<td>123</td>
</tr>
<tr>
<td>Short-term Memory/Gsm</td>
<td>Basic Reading Reading Comp.</td>
<td>Rebus Atlantis (KABC)</td>
<td>115 135</td>
</tr>
<tr>
<td>Long-term Memory/Gm</td>
<td>Reading Comprehension</td>
<td>Rebus, Del. Atlantis, De.</td>
<td>140 135</td>
</tr>
</tbody>
</table>

### III. Assessment

**Predicted Area of Weakness**

<table>
<thead>
<tr>
<th>Cognitive Ability</th>
<th>Reflected Skill</th>
<th>Subtest(s)</th>
<th>Standard Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing Speed (Gs)</td>
<td>Basic Reading</td>
<td>WISC Coding [Visual motor integration]</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WISC Symbol Search [No visual motor integration]</td>
<td>65</td>
</tr>
</tbody>
</table>
III. Assessment
Generating Ideas/Producing Work

<table>
<thead>
<tr>
<th>Task</th>
<th>Handwritten</th>
<th>Typed</th>
<th>Latency Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alphabet</td>
<td>2.06</td>
<td>20 s</td>
<td>0 s</td>
</tr>
<tr>
<td>Sentence to copy</td>
<td>0.3 cwpm</td>
<td>23 cwpm</td>
<td>0 s</td>
</tr>
<tr>
<td>Sentence dictated</td>
<td>0.3 cwpm</td>
<td>9 cwpm</td>
<td>1-3 s between words</td>
</tr>
<tr>
<td>Independently composed</td>
<td>0.2 cwpm</td>
<td>16 cwpm</td>
<td></td>
</tr>
<tr>
<td>sentence (high interest topic—chosen by Joey)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handwritten = 3:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Typed = 35 s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Evaluation
Hypotheses validation

Our data provides evidence of the following validated hypothesis...

☐ Joey suffers from a psychological processing deficit that impacts learning: **A deficit in processing speed**

☐ This processing deficit appears most often and with most intensity when there are demands to either write or speak “on his feet”

What is Joey doing inside his head?

- Importance of verbal mediation
- Does Joey utilize internal verbal mediation?
Joey’s internal mediation

- Combination of **verbal mediation** and **silent visual analysis**
- Joey tells us…
  - Verbal mediation done mentally is fluent
  - When he has to say it out loud, it becomes "chopped up."

What is so special about this approach compared to the traditional PSW approach or compared traditional assessment?
IV. Evaluation: What’s so special about this approach?

“Unless your study is exploratory in nature, your hypothesis should always explain what you expect to happen during the course of your experiment or research.”

~ American Scientist

IV. Evaluation: What’s so special about this approach?

**Powerful process**...Analyze existing data and referral information → predict which cognitive abilities will be strengths v. weaknesses

- CHC theory → link between symptoms (referral data), cognitive processes, and the subtests used to validate the hypothesis
- Predictive: Identifying the connections before assessment. This is intentional and logical

IV. Evaluation: Is it worth it?

- Post-evaluation meeting - extremely productive.
  - Atmosphere of understanding
  - Atmosphere of comprehensiveness
  - Increase in Joey's self esteem - focus had always been on lack of product
  - Predicting outcome of tests - adds validity
By the way…

Joey is on the Autism Spectrum… so this approach is not just for SLD

V. Dealing with some concerns

• How do you know that you are testing the correct hypothesis? If not, you are wasting a lot of time.
• What if results are not consistent within your subtests?
• Our school is not an RTI school. Will we have sufficient data?

V. Dealing with some concerns

• One reason for giving an entire IQ battery first is to be able to deal with the possibility that the student is Intellectually Disabled. Shouldn’t come to that conclusion based on a handful of selected subtests
• PSW relies on finding relative (to the overall IQ) strengths and weaknesses. By only giving select subtests, how do you find a ‘relative strength or weakness’?
V. Building Your Hypothesis

- Asking the right questions at a referral becomes crucial.
- This also leads to asking hypothesis-formulating questions when reading prior evaluation data - now that’s new!
- You don’t stop asking questions until you are capable of generating a hypothesis

Hypothesis-generating questions

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- Does Joey understand words with multiple meanings or idiomatic expressions? Gc
The value of the traditional PSW approach

• Washington is not about to abandon the discrepancy table-
• Only a small handful of districts are in a position or frame of mind to use the RTI framework to qualify students as SLD
• The traditional approach gives us a FSIQ that can be used to qualify students-PSW then becomes supportive and explanatory