Example Comprehensive Psychological Report:

John Smith

Strictly Confidential
**This Example Comprehensive Psychological Report** is provided to act as an example of the breadth and thoroughness of an assessment performed by Psychological & Educational Consultancy Services (PECS).

The assessment components meet the WA College of Education / School Curriculum and Standards Authority requirements for Learning Disorders; and the Department of Health / Stimulant Committee requirements for ADHD.

This example report also reflects changes relating to the recent release of the DSM-5 (APA, 2013).

<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Preface</td>
</tr>
<tr>
<td>(2) Biographical Details</td>
</tr>
<tr>
<td>(3) Referral Information</td>
</tr>
<tr>
<td>(4) Current Concerns</td>
</tr>
<tr>
<td>(5) Academic Areas</td>
</tr>
<tr>
<td>(6) Brief Background Information</td>
</tr>
<tr>
<td>(7) Global Screening Assessment</td>
</tr>
<tr>
<td>(8) ADHD Behavioural Assessment</td>
</tr>
<tr>
<td>(9) Socio-emotional Assessment</td>
</tr>
<tr>
<td>(10) Cognitive Assessment</td>
</tr>
<tr>
<td>(11) Educational Assessment</td>
</tr>
<tr>
<td>(12) Phonological Processing Assessment</td>
</tr>
<tr>
<td>(13) Summary</td>
</tr>
<tr>
<td>(14) Conclusion</td>
</tr>
<tr>
<td>(15) Recommendations</td>
</tr>
<tr>
<td>(16) Appendix 1 – WISC-IV Subtest Descriptions</td>
</tr>
<tr>
<td>(17) Appendix 2 – Disorder Definitions</td>
</tr>
<tr>
<td>(18) Appendix 3 – Clinical Cohort Research Findings</td>
</tr>
</tbody>
</table>

### PREFACE

A Comprehensive Psychological Assessment is the systematic collection, analysis and interpretation of developmental, behavioural, socioemotional, cognitive and/or educational information for the purpose of making inferences about underlying brain function.

These inferences are achieved by investigating an individual’s strengths and weaknesses across the aforementioned areas and identifying any patterns that may exist.

Ultimately, the investigation’s aim is to rule out the presence of any clinically significant afflictions, or if indeed present, to facilitate diagnosis of the core underlying problem, identify its aetiology and impact on the individual, and identify any comorbid concerns that may exist.

The large majority of subsequent diagnoses are genetic, hereditary and familial in nature, with a significant minority environmental/experiential in origin.

A Comprehensive Psychological Report contains the information garnered from the Comprehensive Psychological Assessment and is compiled to convey the information to other health and educational professionals for the purpose of specialist diagnosis, further assessment, and/or the implementation of intervention/treatment.
BIOGRAPHICAL DETAILS

Name: John Smith
Date of Birth: 14/04/2000
Gender: Male
Age: 13 years
Grade: 9
School: Local High School
Address: 123 West Coast Drive, TRIGG WA 6029
Parent’s Phone Number: 0444 444 444
Parent’s Email Address: smith@example.net.au

REFERRAL INFORMATION

John was referred to Psychological and Educational Consultancy Services (PECS) by Dr Jane Brown (Consultant Paediatrician) for a Comprehensive Psychological Assessment and indication of whether the results are reflective of an individual with a Specific Learning Disorder and/or Attention-Deficit/Hyperactivity Disorder (ADHD).

CURRENT CONCERNS

From a presented list, John’s parents identified concerns in the following areas:

- Academic
- Attention
- Learning
- Spelling
- Reading
- Written language
- Schoolwork/homework
- Suspected hyperactivity
- Memory

ACADEMIC AREAS

Presented below are parent estimates of John’s achievement in the main academic areas:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Well Below Average</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
<th>Well Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

John’s parents indicated John has received tutoring or extra remediation for the below academic areas:

- Reading
- Writing
- Spelling
- Speech and Language
BRIEF BACKGROUND INFORMATION

Relevant information reported during the initial interview session:

- Was born with no apparent complications.
- Reached most of the major developmental milestones (e.g., crawling, walking, toileting) during the expected age ranges; speaking short sentences was achieved late.
- No major medical or neurological conditions.
- Normal visual and auditory acuity reported.
- No prescription medication use.
- Is a mix of right and left-handed/footed; John’s older brother is left-handed.
- John’s mother reported she was also late to speak, experienced similar academic difficulties during schooling and received English remediation.
- John’s older brother has been diagnosed with Dyslexia and ADHD.

Past assessments and interventions include:

- Speech Therapy (at age 3 to 6 years) for an articulation error with /th/ sounds (e.g. “fwee” for three, “bofe” for both, and “fing” for thing).
- Occupational Therapy (at age 7 years) to help with poor coordination and pencil grip.
- Literacy remediation (Reading Recovery Programme) since Grade 1, however, this has produced little improvement.
- Was retained in Pre-Primary due to; “not being academically ready and having obvious difficulty with speech”.

John’s mother reported John;

- Was a very active 2 to 3 year old.
- Is very impulsive, fails to listen to or follow instructions; will not sit within a group.
- Had problems learning the alphabet; still reverses letters and words.
- Inaccurate and slow reading; further concerns regarding his reading comprehension.
- Difficulties with spelling and transferring ideas onto paper (e.g. essay writing).
- Is better at Maths than English.
- Runs out of time during timed assessments.

John’s English teacher reported John;

- Struggles with un-structured activities, both in the classroom and at recess and lunchtime. He fidgets constantly in the classroom, calls out, leaves his seat, and hastily completes work. He is generally interested in what is happening in the classroom and is curious about different subjects.

Past testing:

- NAPLAN Year 5:
  - Reading – just below average
  - Writing – well below average (approx bottom 10% of year group)
  - Spelling – just below average
  - Grammar & Punctuation – just below average
  - Numeracy – average

- NAPLAN Year 7:
  - Reading – well below average (approx bottom 15% of year group)
  - Persuasive Writing – well below average (approx bottom 20% of year group)
  - Spelling – well below average (approx bottom 20% of year group)
  - Grammar & Punctuation – just below average
  - Numeracy – well above average

Please note that only a brief overview was obtained due to John and his parents already having provided more detailed background information to Dr Brown.

See checklists for more behavioural information.
GLOBAL SCREENING ASSESSMENT

Screening Tests Administered:

<table>
<thead>
<tr>
<th>Test</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>child &amp; adolescent psychprofiler</em> (CAPP; Langsford, Houghton &amp; Douglas, 2014)</td>
<td>23/01/14</td>
</tr>
</tbody>
</table>

CAPP Outline:
The CAPP comprises 126 items and utilises three separate screening forms; the Self-report Form (SRF: 126 items), Parent-report Form (PRF: 126 items), and Teacher-report Form (TRF: 126 items) for the simultaneous screening of 14 of the most prevalent disorders in children and adolescents.


The CAPP is appropriate for the screening of behaviour of children and adolescents between the ages of 2 and 17 years, however, only the Parent-report and Teacher-report Forms are administered for children aged below 10 years due to the reading level requirements of the Self-report Form.

All items of the CAPP require responses to be made on a six-point scale pertaining to the perceived frequency of the behaviour (ie., Never, Rarely, Sometimes, Regularly, Often, or Very Often).

When calculating disorder screening scores, the items are coded as follows: Never = 0, Rarely = 0, Sometimes = 0, Regularly = 1, Often = 1, and Very Often = 1. These values were chosen because although many people with and without disorders may exhibit similar behaviours, it is the frequency of the behaviour that determines whether it is of clinical significance.

A small number of exceptions to these scoring rules apply where some of the behaviours (e.g., fighting with a weapon, stealing) are considered to be of sufficient severity that 'Sometimes' is also awarded a score of 1.

Therefore, the summation of the items within each disorder produces a screening score for that disorder, which if exceeding the screening cutoff score, designates that the individual has been awarded a positive screen for that disorder.

In order to ensure its validity and reliability, the first version of the psychprofiler was subjected to a series of rigorous psychometric analyses over a number of years. This process has involved validation against a large mainstream sample (n>1000) as well as clinical calibration against individuals with formal diagnoses. These analyses found the psychprofiler to be a highly reliable and valid screening instrument.

The CAPP is primarily administered in order to provide an objective indication of whether the individual exhibits behaviours characteristic of a suspected disorder, possible comorbid disorders, and issues pertaining to differential diagnosis.

The psychprofiler has been the most widely used Australian psychiatric / psychological / educational global screening instrument since 2004.

For further information regarding the CAPP, please visit www.psychprofiler.com or contact Dr Shane Langsford on (08) 9388 8044.

Please note that any indication of a positive screen on the CAPP does not constitute a formal diagnosis. A positive screen merely indicates that the individual has met sufficient criteria for a disorder to warrant further investigation.
Global Behavioural Assessment Results:
In order to provide more conclusive information, John, John’s parents, and John’s teacher all completed separate CAPP Forms.

**John self-reported positive screens for:**
- Speech Sound Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

**John’s parents reported positive screens for:**
- Attention-Deficit/Hyperactivity Disorder: Combined Presentation
- Language Disorder
- Speech Sound Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

**John’s teacher reported positive screens for:**
- Attention-Deficit/Hyperactivity Disorder: Predominantly Hyperactive/Impulsive Presentation
- Language Disorder
- Oppositional Defiant Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

A copy of the CAPP Report is included as an Appendix, as are the completed CAPP Forms.

Please refer to the CAPP Report for the individual behaviours which were responsible for the positive screens elicited.
Checklists Administered:

<table>
<thead>
<tr>
<th>Checklists</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Conners’ 3 Parent Rating Scale: Long Form (Conners 3-P, 2014)</td>
<td>23/01/14</td>
</tr>
<tr>
<td>(2) Conners’ 3 Teacher Rating Scale: Long Form (Conners 3-T, 2014)</td>
<td>23/01/14</td>
</tr>
</tbody>
</table>

Conners’ Subscales:

**Conners’ Parent and Teacher Report Subtest Descriptions**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Aggression</td>
<td>Are likely to be physically and verbally aggressive, may show tendencies that are destructive and demonstrate poor control over their anger/aggression. May bully others, be argumentative, and break rules.</td>
</tr>
<tr>
<td>B: Inattention</td>
<td>Have poor concentration, attention and difficulty focusing their mind on work. Often make careless mistakes, have difficulty starting and completing tasks, and tend to be easily bored.</td>
</tr>
<tr>
<td>C: Hyperactivity/Impulsivity</td>
<td>Have difficulty sitting still for very long, feel restless and impulsive. May be easily excited and talk too much.</td>
</tr>
<tr>
<td>D: Peer Relations</td>
<td>May have poor social skills, limited social connections and difficulty with friendships. Appears to be unaccepted by their peers.</td>
</tr>
<tr>
<td>E: Learning Problems¹</td>
<td>Tend to struggle academically. May have difficulty learning and/or remembering new concepts and need more help and explanation.</td>
</tr>
<tr>
<td>F: Executive Functioning¹</td>
<td>Have poor planning, organisational and prioritising skills. Have difficulty starting or finishing tasks.</td>
</tr>
<tr>
<td>G: Conners 3 ADHD Index</td>
<td>Identifies children/adolescents “at risk” for ADHD</td>
</tr>
<tr>
<td>H: Conners 3 GI Total</td>
<td>The CGI Score reflects general problematic behaviour. High scores tend to indicate hyperactivity, but the problems can also be emotional, social, academic or behavioural.</td>
</tr>
<tr>
<td>I: DSM-5 ADHD Inattentive</td>
<td>High scores indicate an above average correspondence with the DSM-5 diagnostic criteria for Inattentive type ADHD</td>
</tr>
<tr>
<td>J: DSM-5 ADHD Hyperactive-Impulsive</td>
<td>High scores indicate an above average correspondence with the DSM-5 diagnostic criteria for Hyperactive-Impulsive type ADHD</td>
</tr>
<tr>
<td>K: DSM-5 Conduct Disorder</td>
<td>High scores indicate an above average correspondence to DSM-5 criteria for Conduct Disorder.</td>
</tr>
<tr>
<td>L: DSM-5 Oppositional Defiant Disorder</td>
<td>High scores indicate an above average correspondence to DSM-5 criteria for Oppositional Defiant Disorder.</td>
</tr>
</tbody>
</table>

¹Learning Problems and Executive Functioning are subscales of Learning Problems/Executive Functioning on the Conners’ 3-T.

An additional 8 screening items for anxiety and depression, as well as critical behaviour questions are also included in the Conners’ Parent & Teacher Report Scales.
Conners’ 3 Interpretive Guidelines:

The authors of the Conners’ 3 Rating Scales (Conners’ 3) state that T-Scores greater than 60 are usually taken to indicate a clinically significant problem.

**Interpretive Guidelines for Conners’ T-Scores and Percentiles**

<table>
<thead>
<tr>
<th>T-Score</th>
<th>Percentile</th>
<th>Interpretive Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30</td>
<td>&lt;2</td>
<td>Markedly Atypical (Low Scores are Good: Not a Concern)</td>
</tr>
<tr>
<td>30-34</td>
<td>2-5</td>
<td>Moderately Atypical (Low Scores are Good: Not a Concern)</td>
</tr>
<tr>
<td>35-39</td>
<td>6-15</td>
<td>Mildly Atypical (Low Scores are Good: Not a Concern)</td>
</tr>
<tr>
<td>40-44</td>
<td>16-26</td>
<td>Slightly Atypical (Low Scores are Good: Not a Concern)</td>
</tr>
<tr>
<td>45-55</td>
<td>27-73</td>
<td>Average (Typical Score: Should Not Raise a Concern)</td>
</tr>
<tr>
<td>56-60</td>
<td>74-85</td>
<td>Slightly Atypical (Borderline: Should Raise a Concern)</td>
</tr>
<tr>
<td>61-65</td>
<td>86-94</td>
<td>Mildly Atypical (Possibly Significant Problem)</td>
</tr>
<tr>
<td>66-70</td>
<td>95-98</td>
<td>Moderately Atypical (Indicates Significant Problem)</td>
</tr>
<tr>
<td>&gt;70</td>
<td>&gt;98</td>
<td>Markedly Atypical (Indicates Significant Problem)</td>
</tr>
</tbody>
</table>

Furthermore, the greater number of subscales that show clinically relevant elevation (i.e. T-Scores above 60), the greater likelihood that the Conners 3 scores indicate a moderate to severe problem.

High scores on the ADHD Index are considered by the checklist authors to be useful for differentiating clinical ADHD individuals from non-clinical individuals. Please note, that the ADHD Index score reported is a probability % figure, not a T-score like the other Indexes.
Checklist Results:

(1) Conners’ 3 Parent Rating Scale:

The Conners’ 3-P is a reliable and valid instrument that contains 110 items pertaining to their perception of their child’s behaviour over the past month.

**Conners’ 3-P Summary Results**

<table>
<thead>
<tr>
<th>Conners’ Subscales</th>
<th>T-Score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inattention</td>
<td>83</td>
</tr>
<tr>
<td>Hyperactivity/Impulsivity</td>
<td>82</td>
</tr>
<tr>
<td>Learning Problems</td>
<td>68</td>
</tr>
<tr>
<td>Executive Functioning</td>
<td>77</td>
</tr>
<tr>
<td>Aggression</td>
<td>89</td>
</tr>
<tr>
<td>Peer Relations</td>
<td>64</td>
</tr>
<tr>
<td>ADHD Index*</td>
<td>98%</td>
</tr>
<tr>
<td>Conners Global Index: Total</td>
<td>77</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Inattentive</td>
<td>82</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Hyperactive-Impulsive</td>
<td>82</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Conduct Disorder</td>
<td>75</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Oppositional Defiant Disorder</td>
<td>72</td>
</tr>
</tbody>
</table>

* T-scores have a mean of 50 and a standard deviation of 10
* T-scores above 60 are deemed by the checklist authors to be clinically significant
# ADHD Index score reported is a probability % figure, not a T-score like the other Indexes.

Please note: Red bars indicate where the T-Score for the Index is above 60. Scores above 60 are deemed by the checklist authors as usually indicating a clinically significant problem in that area.

Although the Conners is predominantly an ADHD checklist, other conditions (e.g., depression, anxiety, autism, etc) can produce clinically elevated Index scores due to shared symptomology, therefore differential diagnosis validation is always necessary.
John’s mother reported that 9 ADHD-I and 6 ADHD-HI DSM-5 criterions were met.

John’s parent-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s mother reported that 5 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.
(2) Conners’ 3 Teacher Rating Scale:

The Conners’ 3-T is a reliable and valid instrument that contains 110 items pertaining to their perception of the student’s behaviour over the past month.

**Conners’ 3-T Summary Results**

<table>
<thead>
<tr>
<th>Conners’ Subscales</th>
<th>T-Score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inattention</td>
<td>75</td>
</tr>
<tr>
<td>Hyperactivity/Impulsivity</td>
<td>76</td>
</tr>
<tr>
<td>Learning Problems</td>
<td>68</td>
</tr>
<tr>
<td>Executive Functioning</td>
<td>77</td>
</tr>
<tr>
<td>Aggression</td>
<td>67</td>
</tr>
<tr>
<td>Peer Relations</td>
<td>64</td>
</tr>
<tr>
<td>ADHD Index*</td>
<td>98%</td>
</tr>
<tr>
<td>Conners Global Index: Total</td>
<td>74</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Inattentive</td>
<td>82</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Hyperactive-Impulsive</td>
<td>85</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Conduct Disorder</td>
<td>75</td>
</tr>
<tr>
<td>DSM-5 Symptoms: Oppositional Defiant Disorder</td>
<td>72</td>
</tr>
</tbody>
</table>

*T-scores have a mean of 50 and a standard deviation of 10

*T-scores above 60 are deemed by the checklist authors to be clinically significant

# ADHD Index score reported is a probability % figure, not a T-score like the other Indexes.

Please note: Red bars indicate where the T-Score for the Index is above 60. Scores above 60 are deemed by the checklist authors as usually indicating a clinically significant problem in that area.

Although the Conners is predominantly an ADHD checklist, other conditions (e.g., depression, anxiety, autism, etc) can produce clinically elevated Index scores due to shared symptomology, therefore differential diagnosis validation is always necessary.
John’s teacher reported that 8 ADHD-I and 5 ADHD-HI DSM-5 criterions were met.

John’s teacher-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s teacher reported that 4 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.

**Summary of Conners’ results:**
The authors of the Conners’ 3 state that $T$-Scores greater than 60 are usually taken to indicate a clinically significant problem.

Furthermore, the greater number of subscales that show clinically relevant elevation (i.e $T$-Scores above 60), the greater likelihood that the Conners’ 3 scores indicate a moderate to severe problem.

John’s scores exceeded the cut-off for 12 subscales on the Parent-report Conners’ checklist and 12 subscales on the Teacher-report.

John’s parent-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s teacher-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s mother reported that 9 ADHD-I and 6 ADHD-HI DSM-5 criterions were met.

John’s teacher reported that 8 ADHD-I and 5 ADHD-HI DSM-5 criterions were met.

John’s mother reported that 5 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.

John’s teacher reported that 4 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.
Checklists Administered:

Checklists                       Date of Administration
Beck Youth Inventories of Emotional and Social Impairment (Beck: BYI-II: 2005)   23/01/14

Checklists Results:

Beck Youth Inventories of Emotional and Social Impairment (Beck: BYI-II: 2005)

The BYI is a reliable and valid self-report instrument that contains 5 subscales pertaining to self-concept, anxiety, depression, anger, and disruptive behaviour.

<table>
<thead>
<tr>
<th>BYI Subscales</th>
<th>Raw Score</th>
<th>T-Score</th>
<th>Interpretive Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Concept</td>
<td>34</td>
<td>42</td>
<td>Lower than Average</td>
</tr>
<tr>
<td>Anxiety</td>
<td>26</td>
<td>62</td>
<td>Moderately Elevated</td>
</tr>
<tr>
<td>Depression</td>
<td>40</td>
<td>82</td>
<td>Extremely Elevated</td>
</tr>
<tr>
<td>Anger</td>
<td>31</td>
<td>65</td>
<td>Moderately Elevated</td>
</tr>
<tr>
<td>Disruptive Behaviour</td>
<td>22</td>
<td>66</td>
<td>Moderately Elevated</td>
</tr>
</tbody>
</table>

The BYI results indicate that the areas of Self-Concept, Anxiety, Depression, Anger, and Disruptive Behaviour warrant further investigation by a Psychologist to determine if they are indeed a genuine concern and if so, to provide appropriate intervention if deemed necessary.
### Cognitive Assessment

#### Psychometric Tests Administered:

<table>
<thead>
<tr>
<th>Test</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV, 2003)</td>
<td>23/01/14</td>
</tr>
</tbody>
</table>

#### Examiner’s Details:
EXAMINER: Dr Shane Langsford  
TITLE: Registered Psychologist  
REGISTRATION: #PSY0001578191  
TEST SITE: Office at Psychological & Educational Consultancy Services

#### Test Behaviour:
John had significant difficulty remaining still (e.g. fidgeting) and focussed (e.g. looking around the room) throughout the testing period. He was also observed to “give up” easily as the items increased in difficulty.

John demonstrated articulation error with /th/ sounds (e.g. “fwee” for three, “bofe” for both, and “fing” for thing).

It is my opinion that the scores that John achieved on the WISC-IV are an accurate reflection of his cognitive functioning at this particular point in time.

#### Psychometric Test Results:

**Age at Testing: 13 years 9 months**

<table>
<thead>
<tr>
<th>WISC-IV Index</th>
<th>Composite Score</th>
<th>Percentile Rank</th>
<th>95% Confidence Interval</th>
<th>Qualitative Intellectual Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Comprehension (VCI)</td>
<td>95</td>
<td>37</td>
<td>87-103</td>
<td>Average</td>
</tr>
<tr>
<td>Perceptual Reasoning (PRI)</td>
<td>115</td>
<td>84</td>
<td>106-122</td>
<td>High Average</td>
</tr>
<tr>
<td>Working Memory (WMI)</td>
<td>77</td>
<td>6</td>
<td>71-88</td>
<td>Borderline</td>
</tr>
<tr>
<td>Processing Speed (PSI)</td>
<td>78</td>
<td>7</td>
<td>72-91</td>
<td>Borderline</td>
</tr>
<tr>
<td><strong>Full Scale (FSIQ)</strong></td>
<td><strong>Not Valid</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Index scores have a mean Composite Score of 100 (50th percentile) and a standard deviation of 15. Percentile Rank refers to John’s standing among 100 children of similar age. Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age. FSIQ is not considered to be valid if there is a 15+ difference between any of the Indexes.*

The **Verbal Comprehension Index (VCI)** incorporates the 3 subtests of Similarities, Vocabulary, and Comprehension and is designed to measure verbal abilities utilising reasoning, comprehension, and concept formation.
The **Perceptual Reasoning Index (PRI)** comprises the 3 subtests of Block Design, Picture Concepts, and Matrix Reasoning and is designed to measure perceptual reasoning and perceptual organisation.

The **Working Memory Index (WMI)** measures John’s ability to sustain attention, concentrate, and exert mental control. Mental control is the ability to attend to and hold information in conscious awareness whilst performing some operation or manipulation with it, and producing the correct result. Good mental control may facilitate the processing of complex information and ease the learning of new material.

The **Processing Speed Index (PSI)** is an indication of the rapidity with which John can perform mental and graphomotor processing without making errors. Good speed of information processing may free cognitive resources for the processing of more complex information and ease new learning.

The **Full Scale (FSIQ)** refers to John’s performance across all 10 of the core subtests of the WISC-IV and is generally considered the best estimate of general cognitive ability unless there is marked variability among the Index Composite Scores (ie 15+ difference between the Indexes).

### Table 2: WISC-IV Index Discrepancy Summaries

<table>
<thead>
<tr>
<th>WISC-IV Index</th>
<th>Difference</th>
<th>Critical Cutoff</th>
<th>Exceeds .05 Statistical Significance</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Comprehension – Perceptual Reasoning</td>
<td>-20</td>
<td>12.12</td>
<td>Yes</td>
<td>7.9%</td>
</tr>
<tr>
<td>Verbal Comprehension – Working Memory</td>
<td>18</td>
<td>13.15</td>
<td>Yes</td>
<td>8.1%</td>
</tr>
<tr>
<td>Verbal Comprehension – Processing Speed</td>
<td>17</td>
<td>13.78</td>
<td>Yes</td>
<td>11.1%</td>
</tr>
<tr>
<td>Perceptual Reasoning — Working Memory</td>
<td>38</td>
<td>13.48</td>
<td>Yes</td>
<td>0.4%</td>
</tr>
<tr>
<td>Perceptual Reasoning – Processing Speed</td>
<td>37</td>
<td>14.10</td>
<td>Yes</td>
<td>0.2%</td>
</tr>
<tr>
<td>Working Memory — Processing Speed</td>
<td>-1</td>
<td>14.99</td>
<td>No</td>
<td>49.3%</td>
</tr>
</tbody>
</table>

*Base rate refers to the clinical significance (vs Ability Sample) - <15% = clinically significant.*

**Between Index Interpretation:**
John performed much better on nonverbal than on verbal reasoning tasks. The -20 point difference between the VCI and PRI scores is statistically significant at the .05 level.

The 38 point difference between the PRI and WMI scores is statistically significant at the .05 level.

John’s abilities to sustain attention, concentrate, and exert mental control are a weakness relative to his nonverbal and verbal reasoning abilities. A weakness in mental control may make the processing of complex information more time consuming for John, drain his mental energies more quickly as compared to other children his age, and perhaps result in more frequent errors on a variety of learning tasks.

John’s PRI score is significantly higher than the PSI score. This result suggests that John’s visual perceptual abilities may be hindered by slowed processing speed.

Processing visual material quickly is an ability that John performs poorly as compared to his nonverbal reasoning ability.

Furthermore, John’s score on the PSI has been identified as a significant weakness relative to his VCI score. These results suggest relatively slow speed in completing visual motor integration tasks but do not necessarily imply a relative weakness in processing auditory or complex problems.
Because learning often involves a combination of routine information processing (such as reading) and complex information processing (such as reasoning), a weakness in the speed of processing routine information may make the task of comprehending novel information more time-consuming and difficult for John. Thus, this weakness in simple visual scanning and tracking may leave him less time and mental energy for the complex task of understanding new material.

The PRI score is not as highly correlated with school achievement as is the VCI and although the PRI score may well be the better indicator of general ability under the circumstances, it is not as good a predictor of school grades as is the VCI.

Poor performance on the PSI is characteristic of many neuropsychological conditions such as ADHD, anxiety, depression, and learning disorders.

**Verbal Comprehension weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:**
- Trouble understanding verbal directions and/or instructions. This will be more so with complex language, or when multiple steps are included in an instruction.
- Increased difficulty completing exams that require a large written output (i.e. essays, long answer questions).
- Being seen as ‘poor listeners’. These children can appear to be easily distracted and inattentive at times, especially when faced with high verbal task demands.
- Difficulty with ‘word based maths problems’ – generally these children will have adequate maths abilities but the child will find it difficult to demonstrate this when the maths questions is buried in text.
- Being stronger at maths, and science, where they can ‘show’ what they know in ways that are not heavily language based.
- Improved learning from charts, visual materials, diagrams, videos, or hands-on learning demonstrations.
- Difficulty in terms of reading comprehension – they may need to re-read a given text in order to fully understand the meaning.
- Difficulty in understanding abstract concepts, particularly when asked to perform tasks that rely heavily on verbal abstract reasoning.
- Difficulty in understanding social conventions (i.e. what should you do if you find a wallet in a store).

**Working Memory weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:**
- Difficulty absorbing teachers instructions, particularly if they contain more than one step.
- Wide ranging difficulties in both maths and reading, both of which are activities that place high demand on working memory ability.
- May show overall lower achievement across classroom activities, due to the impact of working memory weaknesses on efficiency in terms of learning new information. These children appear to be slower than peers in terms of learning new skills.
- Difficulty performing mental maths calculations.
- Struggling to copy information from the board, both accurately and quickly.
- Frequent errors across tasks that involve the child to recall small amounts of information, while at the same time performing another task.
- Difficulty performing tasks with a number of steps, they may miss out steps or make mistakes in terms of not carefully paying attention to the details.
- Appearing to have a relatively short attention span, they may appear inattentive or distractible.
Processing Speed weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:

- Difficulty processing large amounts of information, or being able to understand long, complex instructions.
- Poorer performance across timed tasks/exams relative to peers. These children need more time to be able to show what they do know.
- Being overall slower to complete tasks in class or for homework.
- Being slower at copying information down from the board, or writing down what the teacher is saying.
- Written work is very time consuming, it takes these children a long time to write down what they know.
- Easy to fatigue; these children need to use more cognitive resources to complete the same amount of work as their peers.
- Difficulty following conversations, or keeping track of the plot in books/movies.

**Table 3: WISC-IV Within-Index Discrepancies**

<table>
<thead>
<tr>
<th>Discrepancy Comparisons</th>
<th>Difference</th>
<th>Critical Cutoff</th>
<th>Exceeds .05 Statistical Significance</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit Span — Letter-Number Sequencing</td>
<td>2</td>
<td>3.20</td>
<td>No</td>
<td>27.4%</td>
</tr>
<tr>
<td><strong>Coding — Symbol Search</strong></td>
<td>-6</td>
<td><strong>3.90</strong></td>
<td>Yes</td>
<td>1.4%</td>
</tr>
<tr>
<td>Similarities — Picture Concepts</td>
<td>-2</td>
<td>3.61</td>
<td>No</td>
<td>34.1%</td>
</tr>
<tr>
<td>Coding — Cancellation</td>
<td>-2</td>
<td>3.73</td>
<td>No</td>
<td>31.8%</td>
</tr>
<tr>
<td><strong>Symbol Search — Cancellation</strong></td>
<td>4</td>
<td><strong>3.83</strong></td>
<td>Yes</td>
<td>11.7%</td>
</tr>
</tbody>
</table>

Base rate refers to the clinical significance (vs Ability Sample) - <15% = clinically significant.

**Within Index/Within-Factor Interpretation:**
John’s within-Index and within-Factor score pattern illustrated statistically significant discrepancies among the Processing Speed Index, therefore, independent interpretation of the individual subtests comprising the PSI may be wise rather than interpretation of the Index as a whole.
Table 4: WISC-IV Subtest Scaled Scores

<table>
<thead>
<tr>
<th>Subtests</th>
<th>Scaled Score</th>
<th>Test Age Equivalent</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verbal Comprehension Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similarities</td>
<td>10</td>
<td>12:10</td>
<td>50</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>8</td>
<td>10:6</td>
<td>25</td>
</tr>
<tr>
<td>Comprehension</td>
<td>9</td>
<td>11:6</td>
<td>37</td>
</tr>
<tr>
<td><strong>Perceptual Reasoning Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block Design</td>
<td>13</td>
<td>&gt;16:10</td>
<td>84</td>
</tr>
<tr>
<td>Picture Concepts</td>
<td>12</td>
<td>&gt;16:10</td>
<td>75</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>12</td>
<td>&gt;16:10</td>
<td>75</td>
</tr>
<tr>
<td><strong>Working Memory Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digit Span</td>
<td>7</td>
<td>8:10</td>
<td>16</td>
</tr>
<tr>
<td>Letter-Number Sequencing</td>
<td>5</td>
<td>7:10</td>
<td>5</td>
</tr>
<tr>
<td><strong>Processing Speed Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coding</td>
<td>3</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Symbol Search</td>
<td>9</td>
<td>11:10</td>
<td>37</td>
</tr>
<tr>
<td>*Cancellation</td>
<td>5</td>
<td>8:2</td>
<td>5</td>
</tr>
</tbody>
</table>

See Appendix 1 for complete subtest descriptions.
*Non-core subtest.

Figure 1: WISC-IV Subtest Scaled Scores

Vertical bar represents the Standard Error of Measurement.
### Table 5: WISC-IV Subtest Discrepancies From Index Subtest Mean

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Subtest Scaled Score</th>
<th>Mean Scaled Score</th>
<th>Difference From Mean</th>
<th>.05 Strength or Weakness</th>
<th>Base Rate@</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceptual Reasoning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block Design</td>
<td>13</td>
<td>12.33</td>
<td>0.67</td>
<td>2.37</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Picture Concepts</td>
<td>12</td>
<td>12.33</td>
<td>-0.33</td>
<td>2.59</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>12</td>
<td>12.33</td>
<td>-0.33</td>
<td>2.20</td>
<td>&gt;25%</td>
</tr>
<tr>
<td><strong>Verbal Comprehension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similarities</td>
<td>10</td>
<td>9.00</td>
<td>1.00</td>
<td>2.43</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>8</td>
<td>9.00</td>
<td>-1.00</td>
<td>2.47</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Comprehension</td>
<td>9</td>
<td>9.00</td>
<td>0.00</td>
<td>2.77</td>
<td>&gt;25%</td>
</tr>
</tbody>
</table>

@ Base rate refers to the clinical significance (vs Ability Sample) - <15% = clinically significant. See Appendix 1 for complete subtest descriptions.

### Table 6: WISC-IV WMI and PSI Subtest Discrepancies From PRI Index Subtest Mean

Please note, the statistics provided in this table are not standard WISC-IV analyses and are provided as a guide only.

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Subtest Scaled Score</th>
<th>PRI Mean Score</th>
<th>Difference From PRI Mean</th>
<th>Nominal Critical Cutoff</th>
<th>.05 Strength or Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Working Memory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digit Span</td>
<td>7</td>
<td>12.33</td>
<td>-5.33</td>
<td>2.50</td>
<td>Significant Weakness</td>
</tr>
<tr>
<td>Letter-Number Sequencing</td>
<td>5</td>
<td>12.33</td>
<td>-7.33</td>
<td>2.50</td>
<td>Significant Weakness</td>
</tr>
<tr>
<td><strong>Processing Speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coding</td>
<td>3</td>
<td>12.33</td>
<td>-9.33</td>
<td>2.50</td>
<td>Significant Weakness</td>
</tr>
<tr>
<td>Symbol Search</td>
<td>9</td>
<td>12.33</td>
<td>-3.33</td>
<td>2.50</td>
<td>Significant Weakness</td>
</tr>
<tr>
<td>*Cancellation</td>
<td>5</td>
<td>12.33</td>
<td>-7.33</td>
<td>2.50</td>
<td>Significant Weakness</td>
</tr>
</tbody>
</table>

* See Appendix 1 for complete subtest descriptions.
*Non-core subtest.

**Intellectual Strengths and Weaknesses:**
Statistical analysis of the results revealed the following subtests to be significant (.05) cognitive strengths or weaknesses relative to John’s own performance.

**Strengths:**
Zero significant (.05) cognitive strengths relative to John’s own performance were found.

**Weaknesses:**
Five significant (.05) cognitive weaknesses relative to John’s own performance were found; namely Digit Span, Letter-Number Sequencing, Coding, Symbol Search and Cancellation.
The *Digit Span* subtest is composed of two parts: Digit Span Forward and Digit Span Backward. Digit Span Forward requires John to repeat numbers in the same order as read aloud by the examiner, and the Digit Span Backward requires the child to repeat the numbers in the reverse order of that presented by the examiner. This subtest measures auditory short-term memory, sequencing skills, attention and concentration. The Digit Span Forward task involves rote learning and memory, attention, encoding, and auditory processing. Digit Span Backward involves working memory, transformation of information, mental manipulation, and visuospatial imaging. The shift from Digit Span Forward to Digit Span Backward requires cognitive flexibility and alertness.

*Letter-Number sequencing* requires the child to read a sequence of numbers and letters and recall the numbers in ascending order and the letters in alphabetical order. The task requires sequencing, mental manipulation, attention, short-term auditory memory, visuospatial imaging, and processing speed.

The *Coding* subtest involved John copying symbols that are paired with simple geometric shapes or numbers. Using a key, John drew each symbol in its corresponding shape or box within a specified time limit. In addition to processing speed, the subtest measures short-term memory, visual and sequential processing, learning ability, cognitive flexibility, attention, and motivation.

John was required to scan a search group and indicate whether the target symbol(s) matches any of the symbols in the search group within a specified time limit on the *Symbol Search* subtest. In addition to processing speed, the Symbol Search subtest also involves short-term visual memory, visual-motor coordination, cognitive flexibility, visual discrimination, and concentration. It also taps auditory comprehension, perceptual organisation, and planning and learning ability.

On the *Cancellation* subtest, John was required to scan both a random and structured arrangement of pictures and mark target pictures within a specified time limit. This subtest measures processing speed, visual selective attention, vigilance, and visual neglect.

**Table 7: Process Discrepancy Comparison**

<table>
<thead>
<tr>
<th>Subtest/Process Score</th>
<th>Forward Scaled Score</th>
<th>Backward Scaled Score</th>
<th>Difference From Mean</th>
<th>Critical Cutoff</th>
<th>Exceeds .05 Statistical Significance</th>
<th>Base Rate@</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit Span Forward – Digit Span Backward</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>3.97</td>
<td>No</td>
<td>20.3%</td>
</tr>
</tbody>
</table>

*Statistical Significance (Critical Values) at the .05 level.*

**Process Discrepancy Interpretation:**
John’s performance on the Digit Span Backward portion of the subtest was commensurate with his performance on the Digit Span Forward portion.
Educational Achievement Tests Administered:

<table>
<thead>
<tr>
<th>Tests</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wechsler Individual Achievement Test-Second Edition (WIAT-II)</td>
<td>23/01/14</td>
</tr>
<tr>
<td>The Handwriting Speed Test (Wallen, Bonney, &amp; Lennox, 1996)</td>
<td>23/01/14</td>
</tr>
</tbody>
</table>

WIAT-II Subtests:

Table 1: WIAT-II Subtest Descriptions

<table>
<thead>
<tr>
<th>READING</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Word Reading</strong></td>
<td>Depending on the student’s age or grade, he or she identifies the letters of the alphabet, beginning and ending sounds of words, and rhyming words, or reads as quickly as possible from a list of words.</td>
</tr>
<tr>
<td><strong>Pseudoword Decoding</strong></td>
<td>The student uses their phonetic knowledge to sound nonsense or unfamiliar words.</td>
</tr>
<tr>
<td><strong>Reading Comprehension</strong></td>
<td>The student reads sentences and short passages and then answers questions about the main idea, specific details, or the order of events. He or she is also asked to make inferences, draw conclusions, or define unfamiliar words by using context clues.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATHEMATICS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numerical Operations</strong></td>
<td>The student solves a word or stated problem requiring addition, subtraction, multiplication, and division using whole numbers, fractions, and decimals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WRITTEN LANGUAGE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spelling</strong></td>
<td>The student spells a target word based on its meaning as it is used in a sentence.</td>
</tr>
<tr>
<td><strong>Written Expression</strong></td>
<td>The student writes words, sentences and either a paragraph or short essay in response to a topic. Writing is evaluated or organisation, vocabulary, theme development, and mechanics such as spelling and punctuation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORAL LANGUAGE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Listening Comprehension</strong></td>
<td>The student listens to a word or sentence and matches it to a picture or looks at a picture and responds with the corresponding word.</td>
</tr>
</tbody>
</table>

Examiner’s Details:
EXAMINER: Dr Shane Langsford  
TITLE: Registered Psychologist  
REGISTRATION: #PSY0001578191  
TEST SITE: Office at Psychological & Educational Consultancy Services

Test Behaviour:
John was observed to incorrectly read words as words with the same initial sound (e.g. “snitch” for stitch), when reading aloud during the Reading Comprehension subtest. Letter transposing was also witnessed.

John was observed to write the incorrect homonym for three test items (e.g. “patience” for patients) during the Spelling subtest. No following of the rule ‘i before e, except after c’, was also witnessed (e.g. ‘recieved’ for received).

A mix of upper and lower case letters and poor spelling, grammar and punctuation were observed during the Written Expression subtest.

It is my opinion that the scores that John achieved on the WIAT-II are indicative of his general educational ability at this particular point in time.
WIAT-II Results:

Grade Level at Testing: 9
Age Level at Testing: 13 years 9 months

Table 2: WIAT-II Summary Statistics

<table>
<thead>
<tr>
<th>WIAT-II Subtest</th>
<th>Standard Score</th>
<th>95% Interval</th>
<th>Percentile</th>
<th>Age Equivalent</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>READING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word Reading</td>
<td>87</td>
<td>80- 94</td>
<td>19</td>
<td>10:0</td>
<td>5:1</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>100</td>
<td>90- 110</td>
<td>50</td>
<td>13:8</td>
<td>8:8</td>
</tr>
<tr>
<td>Pseudoword Decoding</td>
<td>77</td>
<td>70- 84</td>
<td>6</td>
<td>7:0</td>
<td>2:3</td>
</tr>
<tr>
<td>Reading Composite</td>
<td>87</td>
<td>82- 92</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerical Operations</td>
<td>113</td>
<td>105- 121</td>
<td>81</td>
<td>&gt;19:11</td>
<td>&gt;12:9</td>
</tr>
<tr>
<td>WRITTEN LANGUAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td>78</td>
<td>71- 85</td>
<td>7</td>
<td>8:8</td>
<td>3:9</td>
</tr>
<tr>
<td>Written Expression</td>
<td>87</td>
<td>74- 100</td>
<td>19</td>
<td>&lt;12:0</td>
<td>&lt;7:0</td>
</tr>
<tr>
<td>Written Language Composite</td>
<td>81</td>
<td>73- 89</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORAL LANGUAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension</td>
<td>108</td>
<td>94- 122</td>
<td>70</td>
<td>15:0</td>
<td>10:5</td>
</tr>
</tbody>
</table>

Subtest scores have a mean Standard Score of 100 (50th percentile) and a standard deviation of 15. Percentile Rank refers to John’s standing among 100 children of similar age. Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age.

Figure 1: WIAT-II Subtest Standard Scores

---

[Graph of WIAT-II Subtest Standard Scores]
**Subtest Interpretation**

**Reading:**
John presents a diverse set of skills on different aspects of reading. He performed much better on tasks that assessed his capability to read sentences and paragraphs and answer questions about what was read (Reading Comprehension standard score = 100) than on tasks that required him to correctly read a series of printed words (Word Reading standard score = 87). His performance in these areas is greater than his ability to correctly apply phonetic decoding rules when reading a series of nonsense words (Pseudoword Decoding standard score = 77).

Given the disparity in subtest performance, the Reading Composite standard score (87) may not be the most accurate manner in which to summarise his reading skills.

**Mathematics:**
On tasks that required him to add, subtract, multiply, and divide one- to three-digit numbers, fractions, and decimals; and solve simple linear equations John performed in the High Average range. He achieved a Numerical Operations standard score of 113. His skills in this area exceed those of approximately 81% of students his age.

**Oral Language:**
John performed in the Average range on tasks that required him to identify the picture that best represents an orally presented descriptor or generate a word that matches the picture as indicated by his Listening Comprehension standard score (108). His skills in this area exceed that of approximately 70% of students his age.

**Written Language:**
In overall written language skills, John performed in the Low Average range, as indicated by his Written Language Composite standard score (81). His achievement in this area is better than that of 10% of students his age.

John's performance on tasks that required him to generate words within a category, generate sentences to describe visual cues, combine sentences, and compose an organised, persuasive essay on a named topic (Written Expression standard score = 87) is comparable to his performance on tasks that required him to correctly spell verbally presented words (Spelling standard score = 78).
Comparison of Cognitive Ability and Educational Achievement
Because of John’s unusually diverse cognitive abilities, the combined WISC-IV Full Scale IQ score is not the best representation of his general cognitive ability.

Therefore, John’s scores on the WIAT-II were compared using his PRI score as the comparative cognitive measure.

Table 3: Comparative Analyses Between the WISC-IV PRI and WIAT-II

<table>
<thead>
<tr>
<th>WIAT-II Subtest</th>
<th>WISC-IV Predicted Score</th>
<th>WIAT-II Actual Score</th>
<th>Difference</th>
<th>Critical Cut-off Required For Significance</th>
<th>Strength or Weakness</th>
<th>Base Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>READING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word Reading</td>
<td>109</td>
<td>87</td>
<td>22</td>
<td>7.67</td>
<td>Significant Weakness</td>
<td>4%</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>109</td>
<td>100</td>
<td>9</td>
<td>11.94</td>
<td>Low</td>
<td>25%</td>
</tr>
<tr>
<td>Pseudoword Decoding</td>
<td>109</td>
<td>77</td>
<td>32</td>
<td>7.55</td>
<td>Significant Weakness</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Reading Composite</td>
<td>110</td>
<td>87</td>
<td>23</td>
<td>7.55</td>
<td>Significant Weakness</td>
<td>2-3%</td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerical Operations</td>
<td>110</td>
<td>113</td>
<td>-3</td>
<td>9.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRITTEN LANGUAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td>109</td>
<td>78</td>
<td>31</td>
<td>8.73</td>
<td>Significant Weakness</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Written Expression</td>
<td>108</td>
<td>87</td>
<td>21</td>
<td>14.01</td>
<td>Significant Weakness</td>
<td>5-10%</td>
</tr>
<tr>
<td>Written Language Composite</td>
<td>109</td>
<td>81</td>
<td>28</td>
<td>9.81</td>
<td>Significant Weakness</td>
<td>1%</td>
</tr>
<tr>
<td>ORAL LANGUAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension</td>
<td>109</td>
<td>108</td>
<td>1</td>
<td>15.79</td>
<td>&gt;25%</td>
<td></td>
</tr>
</tbody>
</table>

Statistical Significance (Critical Values) at the .05 level.
Base Rates are not reported when the achievement score equals or exceeds the ability score.

Reading
John’s performance on the Word Reading and Pseudoword Decoding subtests were found to be significantly below expectation in relation to his chronological age and cognitive ability.

John’s performance on the Reading Comprehension subtest was commensurate with his chronological age and cognitive ability.

Mathematics
John’s performance on the Numerical Operations subtest was commensurate with his chronological age and cognitive ability.

Written Language
John’s performance on the Written Language subtests were found to be significantly below expectation in relation to his chronological age and cognitive ability.

Oral Language
John’s performance on the Listening Comprehension subtest was commensurate with his chronological age and cognitive ability.
Figure 2: WISC-IV / WIAT-II Index / Subtest Strengths and Weaknesses

Please note: A percentile of 50 is representative of average for the given age group.

John’s scores on the WIAT-II were compared to his WISC-IV PRI score (green spotted bar), which was identified as his most appropriate true ability cognitive measure.

**WISC-IV:**
Red spotted bars indicate where the WISC-IV Index score is significantly below the WISC-IV true ability cognitive measure, thus indicating a clinically significant weakness in that area.

Orange spotted bars indicate where the WISC-IV Index score is below the WISC-IV true ability cognitive measure, but not quite meeting statistical significance.

Green bars indicate where the WISC-IV Index score is not below the WISC-IV true ability cognitive measure.

**WIAT-II:**
Red bars indicate where the WIAT-II actual score is significantly below the WISC-IV predicted score, thus being deemed by the test authors as indicating a clinically significant weakness in that area.

Orange bars indicate where the WIAT-II actual score is below the WISC-IV predicted score, but not quite meeting statistical significance.

Green bars indicate where the WIAT-II actual score is not below the WISC-IV predicted score.
Reading Speed:

**Figure 3: WIAT-II Reading Comprehension and Reading Speed Quartiles**

![Graph showing reading comprehension and speed quartiles](chart)

**Comparison of Reading Comprehension and Reading Speed**

John’s results demonstrated that his Reading Speed is in the first quartile (far below average to below average), whereas his Reading Comprehension is in the third quartile (average to above average).

This illustrates that John’s Reading Speed is significantly below that of similar aged peers and intimates that he must read at a slower rate to successfully comprehend information he has read.

(2) The Handwriting Speed Test (Wallen, Bonney, & Lennox, 1996)

The Handwriting Speed Test is a standardised assessment of a child’s speed of handwriting.

The authors provide the following category cut-offs as a measure of handwriting speed ability.

<table>
<thead>
<tr>
<th>Scaled Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-19</td>
<td>Superior Performance</td>
</tr>
<tr>
<td>14-16</td>
<td>Above Average Handwriting Speed</td>
</tr>
<tr>
<td>7-13</td>
<td>Average</td>
</tr>
<tr>
<td>4-6</td>
<td>Handwriting Speed Impaired</td>
</tr>
<tr>
<td>1-3</td>
<td>Handwriting Speed Significantly Impaired</td>
</tr>
</tbody>
</table>

**Results:**

John was able to write 222 letters during the 3 minute time period; which equates to a speed of 74 letters per minute (Scaled Score = 3; 1st percentile).

This result indicates severely impaired writing speed in comparison to his true cognitive ability and age-related peers.
Educational Summary:
John demonstrated significant weaknesses in Pseudoword Decoding, Spelling, Word Reading, and Written Expression on the WIAT-II.

Please note, due to the 15 plus difference between the Indexes, the FSIQ is deemed to be not valid, therefore the PRI score was used as the comparative cognitive measure.

John’s Reading Speed is far below average to below average, while his Reading Comprehension is average to above average.

This illustrates that John’s Reading Speed is significantly below that of similar aged peers and intimates that he must read at a slower rate to successfully comprehend information he has read.

John was able to write 222 letters during the 3 minute time period; which equates to a speed of 74 letters per minute (Scaled Score = 3; 1st percentile).

This result indicates severely impaired writing speed in comparison to his true cognitive ability and age-related peers.
PHONOLOGICAL PROCESSING ASSESSMENT

Test Administered:

<table>
<thead>
<tr>
<th>Test Administration</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive Test of Phonological Processing (CTOPP)</td>
<td>23/01/14</td>
</tr>
</tbody>
</table>

The CTOPP is an individually administered assessment of phonological awareness, phonological memory and rapid naming. A deficit in one or more of these kinds of phonological processing abilities is viewed as the most common cause of learning disabilities in general, and of reading disabilities in particular. The CTOPP can be used for individuals aged 5 years 0 months to 24 years 11 months.

The CTOPP consists of six subtests that measure some aspect of phonological processing.

These six subtests combine to form three Composites that are useful in the overall assessment of the main areas of phonological processing and may identify areas of specific difficulty.

Table 1: CTOPP Subtests

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elision (EL)</td>
<td>This 20-item subtest measures the extent to which an individual can say a word, then say what is left after dropping out designated sounds.</td>
</tr>
<tr>
<td>Blending Words (BW)</td>
<td>This 20-item subtest measures an individual’s ability to combine sounds to form words.</td>
</tr>
<tr>
<td>Sound Matching (SM)</td>
<td>This 20-item subtest measures the extent to which an individual can match sounds.</td>
</tr>
<tr>
<td>Memory for Digits (MD)</td>
<td>This 21-item subtest measures the extent to which an individual can repeat a series of numbers ranging in length from two to eight digits.</td>
</tr>
<tr>
<td>Nonword Repetition (NR)</td>
<td>This 18-item subtest measures an individual’s ability to repeat nonwords that range in length from 3 to 15 seconds.</td>
</tr>
<tr>
<td>Rapid Digit Naming (RD)</td>
<td>This 72-item subtest measures the speed with which an individual can name the numbers on two pages.</td>
</tr>
<tr>
<td>Rapid Letter Naming (RL)</td>
<td>This 72-item subtest measures the speed with which an individual can name the letters on two pages.</td>
</tr>
</tbody>
</table>
Checklist Results:

Grade Level at Testing: 9  
Age Level at Testing: 13 years 9 months

Table 2: CTOPP Summary Statistics

<table>
<thead>
<tr>
<th>CTOPP Subtest</th>
<th>Standard Score</th>
<th>Percentile</th>
<th>Age Equivalent</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elision</td>
<td>8</td>
<td>25</td>
<td>7:6</td>
<td>2:4</td>
</tr>
<tr>
<td>Blending Words</td>
<td>8</td>
<td>25</td>
<td>8:9</td>
<td>3:7</td>
</tr>
<tr>
<td>Memory for Digits</td>
<td>8</td>
<td>25</td>
<td>7:6</td>
<td>2:4</td>
</tr>
<tr>
<td>Rapid Digit Naming</td>
<td>7</td>
<td>16</td>
<td>10:6</td>
<td>5:4</td>
</tr>
<tr>
<td>Nonword Repetition</td>
<td>8</td>
<td>25</td>
<td>8:9</td>
<td>3:7</td>
</tr>
<tr>
<td>Rapid Letter Naming</td>
<td>5</td>
<td>5</td>
<td>9:9</td>
<td>4:7</td>
</tr>
</tbody>
</table>

Subtest scores have a mean Standard Score of 10 (50th percentile) and a standard deviation of 3.  
Percentile Rank refers to John’s standing among 100 children of similar age.  
Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age.

Figure 1: CTOPP Subtests
The six subtests from the CTOPP are combined to form three Composites that provide information about the three key areas of phonological processing: Phonological Awareness, Phonological Memory and Rapid Naming.

**Table 3: CTOPP Composites**

<table>
<thead>
<tr>
<th>Composite</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonological Awareness (PACS)</td>
<td>Measures an individual’s phonological awareness – awareness of and access to the phonological structure of oral language.</td>
</tr>
<tr>
<td>Phonological Memory (PMCS)</td>
<td>Measures the examinee’s ability to code information phonologically for temporary storage in working memory or short-term memory.</td>
</tr>
<tr>
<td>Rapid Naming (RNCS)</td>
<td>Measures the examinee’s efficient retrieval or phonological information from long-term or permanent memory, as well as the examinee’s ability to execute a sequence of operations quickly and repeatedly.</td>
</tr>
</tbody>
</table>

**Table 4: CTOPP Composite Results**

<table>
<thead>
<tr>
<th>Composite</th>
<th>Composite Score*</th>
<th>Percentile Rank</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonological Awareness</td>
<td>88</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>Phonological Memory</td>
<td>88</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>Rapid Naming</td>
<td>76</td>
<td>5</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Composite scores have a mean Standard Score of 100 (50th percentile) and a standard deviation of 15.

Percentile Rank refers to John’s standing among 100 children of similar age.

Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age.

Contrasted with his comparative WISC-IV result (PRI = 84th percentile), this would suggest that John is having difficulty in all three phonological processing composites.

**Table 5: WISC-IV vs CTOPP Comparative Results**

<table>
<thead>
<tr>
<th>Composite</th>
<th>Percentile Rank</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>WISC-IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WISC-IV PRI</td>
<td>84</td>
<td>High Average</td>
</tr>
<tr>
<td>CTOPP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTOPP Phonological Awareness</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>CTOPP Phonological Memory</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>CTOPP Rapid Naming</td>
<td>5</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Percentile Rank refers to John’s standing among 100 children of similar age.

Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age.
Please note: A percentile of 50 is representative of average for the given age group.

**CTOPP:**

John’s scores on the CTOPP were compared to his WISC-IV PRI score (green spotted bar), which was identified as his most appropriate true ability cognitive measure.

Red bars indicate where the CTOPP Composite score is significantly below the WISC-IV true ability cognitive measure, thus being deemed as indicating a clinically significant weakness in that area.

Orange bars indicate where the CTOPP Composite score is below the WISC-IV true ability cognitive measure, but not quite meeting statistical significance.

Green bars indicate where the CTOPP Composite score is not below the WISC-IV true ability cognitive measure.

Phonological Awareness weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:

- Children who have difficulty with phonological awareness will often be unable to recognise or isolate the individual sounds in a word, recognise similarities between words (as in rhyming words), or be able to identify the number of sounds in a word. These deficits can affect all areas of language including reading, writing, and understanding of spoken language.
- If a child lacks phonemic awareness, they will have difficulty learning the relationship between letters and the sounds they represent in words, as well as applying those letter/sound correspondences to help them “sound out” unknown words.
- Acquiring phonemic awareness is important because it is the foundation for spelling and word recognition skills.
- Auditory/sound blending skills (e.g. What word would you have if you put these sounds together? /s/ /a/ /t/).
- Trouble understanding spelling rules and conventions.
- Have trouble remembering new words and as a consequence have a weak vocabulary and/or word retrieval difficulties.
- Problems with reading fluency.
Phonological Memory weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:

- Difficulty learning new written and spoken vocabulary.
- Difficulty remembering and therefore following complex instructions.
- Impaired ability to comprehend complex written and spoken sentences.
- Difficulty recalling factual information in written texts and lectures.
- Difficulty decoding unfamiliar words (i.e. sounding and blending words especially complex words).
- Poor concentration or attention (e.g. may daydream or distract others if they fail to recall/process instructions).
- Difficulty with rote sequences such as months of the year, the alphabet, times tables, phone numbers etc.
- Difficulty holding speech sounds in memory long enough to determine how to spell and read longer words.

Rapid Naming weaknesses can cause difficulty learning in the classroom and performing to ability in exams by:

- In the classroom, the decoding and naming of numbers, letters and words is practiced to become automatic in order to develop speed of processing, efficiency or working memory and fluency and accuracy in speaking, reading and writing.
- Individuals who score poorly commonly have problems with reading fluency.
- Lack of automaticity with quickly and accurately identifying letter names/sounds, numbers, phonic patterns (e.g. ‘ch’ and ‘th’) and whole words (i.e. sight vocabulary).
- This can affect a child’s ability to efficiently decode/encode unfamiliar words.
- It also affects the ability to efficiently recall/retrieve the names of objects, colours and even people’s names.
- Slow naming speed can affect how well an individual will be able to integrate and organise ideas in their head, before these ideas are even put into words.
- Becomes more apparent as greater demands are placed on an individual’s ability to retrieve information under timed conditions.

Summary of CTOPP results:
John’s CTOPP results indicate that he scored at the 21st percentile for Phonological Awareness, 21st percentile for Phonological Memory, and at the 5th percentile for Rapid Naming.

Contrasted with his comparative WISC-IV result (PRI = 84th percentile), this would suggest that John is having difficulty in all three phonological processing composites.

A deficit in Phonological Awareness is viewed as the hallmark of reading disability or dyslexia. Poor phonological awareness is associated with poor reading for both individuals whose poor reading levels are discrepant from their IQs and for individuals whose poor reading levels are consistent with their IQs.

A deficit in Phonological Memory does not inevitably lead to poor reading of familiar material but is more likely to impair decoding of new words, particularly words that are long enough to decode bit by bit, as a means of storing intermediate sounds. It is likely to impair both listening and reading comprehension for more complex sentences.

Individuals who score poorly in Rapid Naming commonly have problems with reading fluency.
SUMMARY

Reason for Referral:
John was referred to Psychological and Educational Consultancy Services (PECS) by Dr Jane Brown (Consultant Paediatrician) for a Comprehensive Psychological Assessment and indication of whether the results are reflective of an individual with a Specific Learning Disorder and/or Attention-Deficit/Hyperactivity Disorder (ADHD).

Current Concerns:
From a presented list, John’s parents identified concerns in the following areas:

- Academic
- Attention
- Learning
- Spelling
- Reading
- Written language
- Schoolwork/homework
- Suspected hyperactivity
- Memory

Academic Areas:
Presented below are parent estimates of John’s achievement in the main academic areas:

<table>
<thead>
<tr>
<th>Maths</th>
<th>Well Below Average</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
<th>Well Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>Well Below Average</td>
<td>Below Average</td>
<td>Average</td>
<td>Above Average</td>
<td>Well Above Average</td>
</tr>
<tr>
<td>Writing</td>
<td>Well Below Average</td>
<td>Below Average</td>
<td>Average</td>
<td>Above Average</td>
<td>Well Above Average</td>
</tr>
<tr>
<td>Spelling</td>
<td>Well Below Average</td>
<td>Below Average</td>
<td>Average</td>
<td>Above Average</td>
<td>Well Above Average</td>
</tr>
<tr>
<td>Language</td>
<td>Well Below Average</td>
<td>Below Average</td>
<td>Average</td>
<td>Above Average</td>
<td>Well Above Average</td>
</tr>
</tbody>
</table>

John’s parents indicated John has received tutoring or extra remediation for the below academic areas:

- [X] Reading
- [X] Writing
- [X] Spelling
- [ ] Maths
- [X] Speech and Language

Global Behavioural Assessment:
John self-reported positive screens for:

- Speech Sound Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

John’s parents reported positive screens for:

- Attention-Deficit/Hyperactivity Disorder: Combined Presentation
- Language Disorder
- Speech Sound Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

John’s teacher reported positive screens for:

- Attention-Deficit/Hyperactivity Disorder: Predominantly Hyperactive/Impulsive Presentation
- Language Disorder
- Oppositional Defiant Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression
ADHD Behavioural Assessment: 
John’s scores exceeded the cut-off for 12 subscales on the Parent-report Conners’ checklist and 12 subscales on the Teacher-report.

John’s parent-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s teacher-report score on the ADHD Index indicates that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).

John’s mother reported that 9 ADHD-I and 6 ADHD-HI DSM-5 criterions were met.

John’s teacher reported that 8 ADHD-I and 5 ADHD-HI DSM-5 criterions were met.

John’s mother reported that 5 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.

John’s teacher reported that 4 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.

Socio-Emotional Assessment:
The BYI results indicate that the areas of Self-Concept, Anxiety, Depression, Anger, and Disruptive Behaviour warrant further investigation by a Psychologist to determine if they are indeed a genuine concern and if so, to provide appropriate intervention if deemed necessary.

Cognitive Assessment:
Because of John’s unusually diverse cognitive abilities, the combined WISC-IV Full Scale IQ score is not a valid representation of his general cognitive ability, and therefore was not calculated.

The discrepancy between John’s Verbal Comprehension ability (VCI = 37th percentile) and Perceptual Reasoning ability (PRI = 84th percentile) scores was -20, which is statistically significant at the .05 level.

John achieved a score at the 6th percentile for Working Memory (WMI) and at the 7th percentile for Processing Speed (PSI).

Educational Assessment:
John achieved the following scores on the various academic subtests, with Word Reading, Pseudoword Decoding, Spelling, and Written Expression being identified as significant weaknesses.

Reading:
Word Reading (19th percentile), Reading Comprehension (50th percentile), Pseudoword Decoding (6th percentile), Reading Composite (19th percentile)

John’s Reading Speed is far below average to below average, while his Reading Comprehension is average to above average.

This illustrates that John’s Reading Speed is significantly below that of similar aged peers and intimates that he must read at a slower rate to successfully comprehend information he has read.

Mathematics:
Numerical Operations (81st percentile)

Written Language:
Spelling (7th percentile), Written Expression (19th percentile), Written Language Composite (10th percentile)
Oral Language:
Listening Comprehension (70th percentile)

Handwriting Speed Test:
John was able to write 222 letters during the 3 minute time period; which equates to a speed of 74 letters per minute (Scaled Score = 3; 1st percentile).

This result indicates severely impaired writing speed in comparison to his true cognitive ability and age-related peers.

Phonological Processing Assessment:
John’s CTOPP results indicate that he scored at the 21st percentile for Phonological Awareness, 21st percentile for Phonological Memory, and at the 5th percentile for Rapid Naming.

Contrasted with his comparative WISC-IV result (PRI = 84th percentile), this would suggest that John is having difficulty in all three phonological processing composites.

A deficit in Phonological Awareness is viewed as the hallmark of reading disability or dyslexia. Poor phonological awareness is associated with poor reading for both individuals whose poor reading levels are discrepant from their IQs and for individuals whose poor reading levels are consistent with their IQs.

A deficit in Phonological Memory does not inevitably lead to poor reading of familiar material but is more likely to impair decoding of new words, particularly words that are long enough to decode bit by bit, as a means of storing intermediate sounds. It is likely to impair both listening and reading comprehension for more complex sentences.

Individuals who score poorly in Rapid Naming commonly have problems with reading fluency.
CONCLUSION

Please note, this conclusion is based on the assessment results and background information currently available. Often, it is necessary/wise to perform follow-up confirmationary testing before definitive conclusive statements are made.

SPECIFIC LEARNING DISORDERS:

When investigating the possibility of Specific Learning Disorders, PECS aligns itself with the DSM-5 (see DSM-5 Specific Learning Disorder Fact Sheet information in Appendix) and uses a best-practice hybrid approach which is a cross-battery assessment comprising key elements of the major theoretical models; namely, Aptitude-Achievement Discrepancy model, Low Achievement model, Intra-Individual Differences model, and the Response to Intervention (RTI) model.

John’s academic attainments in Reading (Word Reading and Pseudoword Decoding), and Written Language (Spelling and Written Expression) were found to be significantly below those expected given his chronological age, cognitive ability and education/years of schooling.

These significant, unexpected academic underachievements have persisted despite the provision of at least 6 months of continued, targetted systematic and evidence-based interventions (i.e. little or no improvement in response to intervention (RTI)).

John’s cognitive profile shows marked intra-individual variability and evidence of inherent processing difficulties.

Further investigation reveals that John does not have an intellectual disability, has consistently attended school, does not lack proficiency in the language of academic instruction (e.g., ESL) and does not have any significant medical (e.g., uncorrected visual or auditory acuity), emotional (e.g., other mental or neurological disorders) or family (e.g., psychosocial adversity) history that may be impeding his academic development.

In combination, the current pattern of cross-battery assessment results, background information, exclusion of other possible causes, and little or no improvement in response to intervention (RTI), diagnoses of Specific Learning Disorder – With Impairment in Reading (also known as Dyslexia), and Specific Learning Disorder – With Impairment in Written Expression (also known as Dysgraphia) are confirmed and are deemed to be of a severe nature requiring a high level of ongoing support.

ADHD:

ADHD can also present a cognitive profile of depreciated Working Memory and Processing Speed.

Evidence to support a diagnosis of ADHD includes:

Background:

- John’s older brother has been diagnosed with ADHD.
- John’s mother reported John;
  - Was a very active 2 to 3 year old.
  - Is very impulsive, fails to listen to or follow instructions; will not sit within a group.
- John’s English teacher reported John;
  - Struggles with un-structured activities, both in the classroom and at recess and lunchtime. He fidgets constantly in the classroom, calls out, leaves his seat, and hastily completes work. He is generally interested in what is happening in the classroom and is curious about different subjects.
PsychProfiler:
- Positive screens for Attention-Deficit/Hyperactivity Disorder: Predominantly Hyperactive/Impulsive Presentation, Attention-Deficit/Hyperactivity Disorder: Combined Presentation and Oppositional Defiant Disorder

Conners:
- John’s scores exceeded the cut-off for 12 subscales on the Parent-report Conners’ checklist and 12 subscales on the Teacher-report.
- Both John’s parent-report and teacher-report scores on the ADHD Index indicate that there is a 98% probability that he has ADHD, (unless another factor/diagnosis better explains the behaviours reported).
- John’s mother reported that 9 ADHD-I and 6 ADHD-HI DSM-5 criterions were met.
- John’s teacher reported that 8 ADHD-I and 5 ADHD-HI DSM-5 criterions were met.
- John’s mother reported that 5 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.
- John’s teacher reported that 4 Conduct Disorder and 5 Oppositional Defiant Disorder criterions were met.

BYI:
- The BYI results indicate that the areas of Anger, and Disruptive Behaviour warrant further investigation by a Psychologist to determine if they are indeed a genuine concern and if so, to provide appropriate intervention if deemed necessary.

WISC-IV:
- Severe, statistically significant depreciations in Working Memory (WMI=6th percentile) and Processing Speed (PSI=7th percentile) relative to his true cognitive ability (PRI=84th percentile)
- John had significant difficulty remaining still (e.g. fidgeting) and focussed (e.g. looking around the room) throughout the testing period. He was also observed to “give up” easily as the items increased in difficulty.

WIAT-II:
- Lower than expected performance in numerous academic areas.

Please note, ADHD can only be diagnosed by a Paediatrician, Psychiatrist or Clinical Neurologist. Therefore, if an individual’s cognitive and/or behavioural results suggest that ADHD is a possibility, it is deemed appropriate of PECS to recommend that the appropriate medical professional be consulted for their expert opinion. PECS does not make the recommendation on the basis that they believe the individual has ADHD.

Please note that a GP referral is required to see a specialist.
RECOMMENDATIONS

Please note, PECS does not provide micro-strategies (e.g., sit student at front of classroom, etc) as part of their recommendations. PECS’s provides recommendations on what further assessment is required, what intervention is necessary, and who is the most appropriate to provide the assessment/intervention recommended.

Paediatric Involvement:

(1) John should once again be seen by Dr Brown, now that this new information is available for incorporation into his paediatric assessment.

Behavioural Strategies:

(1) John’s parents may wish to contact Dr Michele Toner for assistance with ADHD management strategies.

Dr Michele Toner  
ADHD Consultant and Life Coach  
Suite 3, 82 Reserve Street, WEMBLEY WA 6014  
Phone: 0411 067 541  
www.micheletoner.com

Please note that strategies to assist with poor concentration, low attention and distractibility are beneficial to people with these characteristics even if they are not formally diagnosed with ADHD.

Parental Involvement:

(1) John’s parents may wish to access the Learning & Attention Deficit Society (LADS) for assistance with ADHD, learning, and behaviour management resources.

LADS - The Niche,  
Suite B, 11 Aberdare Rd (cnr) Hospital Ave, NEDLANDS WA 6009  
Phone: (08) 9346 7544  
www.ladswa.com.au

Please note these resources assist children that display similar traits without actually meeting a diagnosable condition.

(2) John’s parents may also wish to access the Australian Council for Educational Research (ACER) bookshop for assistance with ADHD, learning, and/or behaviour management resources.

ACER Bookshop  
1/1329 Hay Street, WEST PERTH WA 6005  
Phone: (08) 9235 4800  
www.acer.edu.au

Please note these resources assist children that display similar traits without actually meeting a diagnosable condition.
School Involvement:

These results confirm that John has a Specific Learning Disorder – With Impairment in Reading and Written Expression.

For children with Specific Learning Disorders to be successful at school, they require two areas of support, remediation and accommodation.

Remediation involves direct instruction in skills by a specialist teacher and accommodation involves adaptations and modifications of curriculum and instructional practices.

(1) A case-conference involving John's parents, the school psychologist, and key school personnel should be held to discuss John's individual learning requirements.

(2) In light of these new assessment results, an Individual Education Plan (IEP) / Curriculum Adjustment Plan (CAP) should be initiated / amended by John’s teachers in an attempt to maximise John’s access to the curriculum.

(3) John should undergo formal, targeted, systematic, and evidence-based interventions in reading, and writing, as part of an in-school programme or with an external private tutor/specialist.

(4) On-going case management should be carried out by the school, and at the school’s discretion, appropriate special examination arrangements (as per School Curriculum and Standards Authority guidelines) be granted to John for time-restricted tasks due to possible ADHD (Paediatrician appointment to come), a Specific Learning Disorder – With Impairment in Reading and Written Expression and subsequent severe, Working Memory, Processing Speed and Phonological Processing Deficits.

(5) If deemed necessary by the school, at the time of his WACE examinations, an application should be made to the School Curriculum and Standards Authority for Special Examination Arrangements.

Please note, in the event of a successful application for the above-mentioned SEAs, John may be required to sit his WACE exams at a location designated by the School Curriculum and Standards Authority, rather than at his regular school.

Psychological Involvement:

(1) John would benefit from on-going counselling given the levels of Self-Concept, Anxiety, Depression, Anger, and Disruptive Behaviour being reported.

(2) Another psychometric and educational test will be required to be administered closer to his WACE examinations to satisfy School Curriculum and Standards Authority requirements (if applicable).

(3) Due to the large discrepancies identified within the cognitive and educational tests, administration of another assessment in 2 years or beyond would be wise.
Educational Remediation:

(1) John would benefit from specialist reading, writing, and spelling tutoring from one of the following place(s).

The Dyslexia Remediators
524 Jones Street, PERTH WA 6006
Phone: 1300 100 000
www.thedyslexiaremediators.com.au

Cracking the Dyslexia Code
17 Potts Point Road, SOUTH PERTH WA 6151
Phone: 0402 000 000
www.crackingdyslexia.com

Health & Well-Being:

(1) John needs to continue/implement regular exercise and maintain a healthy diet.

Please note, the above is a generic recommendation that should be followed by all and is not a recommendation specific to John due to any of his results or reported behaviours.

______________________________
Dr Shane Langford
Managing Director -PECS
Registered Psychologist
APS College of Educational & Developmental Psychologists Academic Member

______________________________
Date of Report
### APPENDIX 1 - WISC-IV SUBTEST DESCRIPTIONS

<table>
<thead>
<tr>
<th>VERBAL COMPREHENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Similarities</strong></td>
</tr>
<tr>
<td><strong>Vocabulary</strong></td>
</tr>
<tr>
<td><strong>Comprehension</strong></td>
</tr>
<tr>
<td>**Information *</td>
</tr>
<tr>
<td>**Word Reasoning *</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERCEPTUAL REASONING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block Design</strong></td>
</tr>
<tr>
<td><strong>Picture Concepts</strong></td>
</tr>
<tr>
<td><strong>Matrix Reasoning</strong></td>
</tr>
<tr>
<td>**Picture Completion *</td>
</tr>
<tr>
<td>WORKING MEMORY</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Digit Span</strong></td>
</tr>
<tr>
<td><strong>Letter-Number Sequencing</strong></td>
</tr>
<tr>
<td>**Arithmetic **</td>
</tr>
<tr>
<td><strong>PROCESSING SPEED</strong></td>
</tr>
<tr>
<td><strong>Coding</strong></td>
</tr>
<tr>
<td><strong>Symbol Search</strong></td>
</tr>
<tr>
<td><strong>Cancellation</strong></td>
</tr>
</tbody>
</table>

* denotes supplementary subtest which may not be administered unless deemed necessary
APPENDIX 2 – DISORDER DEFINITIONS

SPECIFIC LEARNING DISORDER

The upcoming fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) takes a different approach to learning disorders than previous editions of the manual by broadening the category to increase diagnostic accuracy and effectively target care. Specific learning disorder is now a single, overall diagnosis, incorporating deficits that impact academic achievement. Rather than limiting learning disorders to diagnoses particular to reading, mathematics and written expression, the criteria describe shortcomings in general academic skills and provide detailed specifiers for the areas of reading, mathematics, and written expression.

Characteristics of Specific Learning Disorder

Specific learning disorder is diagnosed through a clinical review of the individual’s developmental, medical, educational, and family history, reports of test scores and teacher observations, and response to academic interventions. The diagnosis requires persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills during formal years of schooling. Symptoms may include inaccurate or slow and effortful reading, poor written expression that lacks clarity, difficulties remembering number facts, or inaccurate mathematical reasoning.

Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. The individual’s difficulties must not be better explained by developmental, neurological, sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living.

Because of the changes in DSM-5, clinicians will be able to make this diagnosis by identifying whether patients are unable to perform academically at a level appropriate to their intelligence and age. After a diagnosis, clinicians can provide greater detail into the type of deficit(s) that an individual has through the designated specifiers. Just as in DSM-IV, dyslexia will be included in the descriptive text of specific learning disorder. The DSM-5 Neurodevelopmental Work Group concluded that the many definitions of dyslexia and dyscalculia meant those terms would not be useful as disorder names or in the diagnostic criteria.

Broader Approach for Targeted Care

Broadening the diagnostic category reflects the latest scientific understanding of the condition. Specific symptoms, such as difficulty in reading, are just symptoms. And in many cases, one symptom points to a larger set of problems. These problems can have long-term impact on a person’s ability to function because so many activities of daily living require a mastery of number facts, written words, and written expression.

Early identification and intervention are particularly important. The broader DSM-5 category of specific learning disorder ensures that fewer affected individuals will go unidentified, while the detailed specifiers will help clinicians effectively target services and treatment. DSM is the manual used by clinicians and researchers to diagnose and classify mental disorders. The American Psychiatric Association (APA) will publish DSM-5 in 2013, culminating a 14-year revision process. APA is a national medical specialty society whose more than 36,000 physician members specialize in the diagnosis, treatment, prevention and research of mental illnesses, including substance use disorders. Visit the APA at www.psychiatry.org

For more information, please contact Eve Herold at 703-907-8640 or press@psych.org

© 2013 American Psychiatric Association
Dyslexia is a broad term defining a learning disability that impairs a person's fluency or accuracy in being able to read, speak, and spell and which can manifest itself as a difficulty with phonological awareness, phonological decoding, orthographic coding, auditory short-term memory, and/or rapid naming. Dyslexia is separate and distinct from reading difficulties resulting from other causes, such as a non-neurological deficiency with vision or hearing, or from poor or inadequate reading instruction. It is believed that dyslexia can affect between 5 to 10 percent of a given population although there have been no studies to indicate an accurate percentage.

There are three proposed cognitive subtypes of dyslexia: auditory, visual and attentional. Although dyslexia is not an intellectual disability, it is considered both a learning disability and a reading disability. Dyslexia and IQ are not interrelated, since reading and cognition develop independently in individuals who have dyslexia.

Accomplished adult dyslexics may be able to read with good comprehension, but they tend to read more slowly than non-dyslexics, and may perform more poorly at nonsense word reading (a measure of phonological awareness), and spelling.

The World Federation of Neurology defines dyslexia as "a disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence and sociocultural opportunity".

MedlinePlus and the National Institutes of Health define dyslexia as "a reading disability resulting from the inability to process graphic symbols".

The National Institute of Neurological Disorders and Stroke gives the following definition for dyslexia: "Dyslexia is a brain-based type of learning disability that specifically impairs a person's ability to read. These individuals typically read at levels significantly lower than expected despite having normal intelligence. Although the disorder varies from person to person, common characteristics among people with dyslexia are difficulty with spelling, phonological processing (the manipulation of sounds), and/or rapid visual-verbal responding. In adults, dyslexia usually occurs after a brain injury or in the context of dementia. It can also be inherited in some families, and recent studies have identified a number of genes that may predispose an individual to developing dyslexia".

Dyslexia is a specific learning disability that is neurological in origin. It is characterised by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Adopted by the IDA Board of Directors, Nov. 12, 2002. This Definition is also used by the National Institute of Child Health and Human Development (NICHD).

Studies show that individuals with dyslexia process information in a different area of the brain than do non-dyslexics. Many people who are dyslexic are of average to above average intelligence.
**DYSLEXIA SPELD FOUNDATION** (http://www.dyslexia-speld.com/):

**Dyslexia** is one of several distinct learning disabilities. It is characterised by a difficulty with reading and writing that often appears to be surprising in a child who otherwise appears capable and academically promising.

Most current definitions of dyslexia focus on the fact that "accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty". This focuses on literacy at the 'word level' and implies that the problem is severe and persistent despite appropriate learning opportunities (The British Psychological Society 1999). Spelling, comprehension, reading accuracy, reading rate, word identification and phonological coding are all affected.

**AUSTRALIAN DYSLEXIA ASSOCIATION** (http://dyslexiaassociation.org.au/):

The student who struggles with reading and spelling often puzzles teachers and parents. The student receives the same classroom instruction as other students, but continues to struggle with some or all of the many facets of reading and spelling. This student may have dyslexia.

The primary symptoms are:
- Problems learning the letter sounds for reading and spelling
- Difficulty in reading single words, such as on flash cards and in lists (decoding)
- Lack of fluency
- Reading slowly with many mistakes
- Poor spelling
- Poor visual gestalt / coding (orthographic coding)

The word dyslexia comes from the Greek language and means difficulty with words. Individuals with dyslexia have trouble with reading and spelling despite having the ability to learn. Individuals with dyslexia can learn, they just learn in a different way. Often these individuals, who have talented and productive minds, are said to have a language learning difference.

A student with dyslexia will have a particular pattern of strengths and weaknesses which indicate a dyslexic profile. The central difficulty for a student with dyslexia is to convert letter symbols to their correct sound (decode) and convert sounds to their correct written symbol (spell). Research into dyslexia subtypes indicate that poor visual (i.e., orthographic) coding can also be part of the difficulty.

**DYSLEXIA AUSTRALIA** (http://www.dyslexia-australia.com.au/):

The *Oxford English Dictionary* defines dyslexia as a disorder involving difficulty in learning to read words, letters and other symbols.

Dyslexia literally means 'trouble with words'. It is the term used to describe difficulties with spelling, writing and reading. The challenges can come in many different forms and are not limited to reversals of letters and words, a common misconception.

Dyslexia Australia’s definition: Dyslexia is the capacity to process information differently, enabling innovative thought and perception. It is characterised by a visual and experiential learning style. Methods using this learning style allow dyslexic people to realise their capabilities and minimise the negative impact commonly developed by conventional methods. (*concept by C. Fraser. Wording by B. Baird and C. Fraser*).
DYSGRAPHIA

DYSLEXIA-SPELD FOUNDATION (http://www.dsf.net.au)

Dysgraphia is a specific learning disability that affects written expression.

Dysgraphia can appear as difficulties with spelling, poor handwriting and trouble putting thoughts on paper. Dysgraphia can be a language based, and/or non-language based disorder.

Many people have poor handwriting, but Dysgraphia is more serious. Dysgraphia is a neurological disorder that generally appears when children are first learning to write. Experts are not sure what causes it, but early treatment can help prevent or reduce problems.

Writing requires a complex set of motor and information processing skills. Not only does it require the ability to organize and express ideas in the mind. It also requires the ability to get the muscles in the hands and fingers to form those ideas, letter by letter, on paper.

Dysgraphia that is caused by a language disorder may be characterised by the person having difficulty converting the sounds of language into written form (phonemes into graphemes), or knowing which alternate spelling to use for each sound. A person with Dysgraphia may write their letters in reverse, have trouble recalling how letters are formed, or when to use lower or upper case letters. A person with Dysgraphia may struggle to form written sentences with correct grammar and punctuation, with common problems including omitting words, words ordered incorrectly, incorrect verb and pronoun usage and word ending errors. People with Dysgraphia may speak more easily and fluently than they write.

Non-language based Dysgraphia’s are those caused by difficulties performing the controlled fine motor skills required to write. The generic term apraxia refers to a wide variety of motor skill deficits in which the voluntary execution of a skilled motor movement is impaired. Apraxia can involve a single controlled movement, or a sequence of movements, such as writing a single letter or entire words.

DYSLEXIA AUSTRALIA (http://www.dyslexia-australia.com.au)

People with Dysgraphia may display the following signs:
- May exhibit strong verbal but particularly poor writing skills.
- Random (or non-existent) punctuation.
- Generally illegible writing, despite appropriate time and attention given the task.
- Inconsistencies: mixtures of print and cursive, upper and lower case.
- Irregular sizes, shapes or slant of letters.
- Unfinished words or letters, omitted words.
- Inconsistent position on page with respect to lines and margins and inconsistent spaces between words and letters.
- Cramped or unusual grip, especially holding the writing instrument very close to the paper, or holding thumb over two fingers and writing from the wrist.
- Talking to self while writing, or carefully watching the hand that is writing.
- Slow or laboured copying or writing - even if it is neat and legible.
Clinical Cohort: Attention Deficit/Hyperactivity Disorder (Children)

Attention Deficit/Hyperactivity Disorder (ADHD) is characterised by a child displaying a persistent pattern of inattention and/or hyperactivity-impulsivity, which occurs in at least 2 different settings (eg. school, home). ADHD symptoms, which lead to functional impairments (social, behavioural and academic), must be present from before seven years old, although the child need necessarily not be diagnosed before that age. ADHD symptoms will tend to worsen in group situations, situations which require sustained effort and attention and situations which are not novel or interesting to the individual.

There are three subtypes of ADHD;
- ADHD, Predominantly Inattentive Type
- ADHD; Predominantly Hyperactive-Impulsive Type
- ADHD; Combined Type

ADHD tends to be more prevalent in males than females, particularly the Hyperactive-Impulsive Type, which has a 9:1 male to female ratio, relative to the 2:1 male to female ratio seen in the Inattentive Type. It has been estimated that ADHD is prevalent in 3-7% of school aged children.

Individuals with primarily inattentive symptoms often fail to pay close attention to details or will tend to make careless mistakes. These individuals tend to find it difficult to sustain their attention long enough to complete a task, in which case they will often rush the task or complete it quickly and with little care. They will tend to start tasks and not complete them, continuously shifting on to something new and more interesting. These individuals will often appear as though they are not listening or are paying attention to something else, appearing distracted and disinterested. These difficulties with sustained attention will often lead to the individual displaying a strong dislike for and avoiding such tasks which require prolonged concentration, (eg. homework, writing a letter etc), as they have difficulties with attention that make completing such tasks difficult for them.

Individuals with hyperactive symptoms are often observed as being unable to sit still, fidgeting in their chair, or by running/climbing when it is inappropriate. These children appear as though they have boundless energy, moving and talking excessively, and will struggle to be able to stay still and engage in sedentary activities, such as sitting and reading a book. With age they will appear to be increasingly restless and have considerable difficulty completing and engaging in quiet and sedentary activities.

Individuals with impulsive symptoms can be characterised as being excessively impatient and displaying difficulty in delaying their responses (calling out answers in class) or waiting their turn. These children will seem to say things without thinking, and others may feel as though it is difficult to get a word in the conversation. This impulsivity may lead to an increased risk of accidents, with the individual rushing in and touching or doing things without allowing time to be careful and consider the potential risks that may be associated. The diagnosis of ADHD needs to be made in consideration of the child’s developmental level, as children can be very active and noisy at times, thus a diagnosis needs to consider what is expected of a child at a given age.

Cognitive
Research (e.g., Barkley et al., 2001; Calhoun, & Dickerson Mayes, 2005; Doyle et al., 2000; Wilcutt et al., 2001) has indicated that children with ADHD typically achieve scores near the normative range of intellectual functioning, but may perform worse on measures of processing speed and working memory, relative to measures of verbal and non-verbal abilities. This would tend to suggest that these children are more likely to display weaknesses in processing speed, basic attention, as well as writing (Calhoun, & Dickerson Mayers, 2005). Given this it is of importance to assess a child’s writing ability, if they are identified as having ADHD. Children with ADD appear to have a greater level of impairment in processing speed, as measured on the WISC-III, relative to children with ADHD, suggesting that comparison if processing speed performance may be a useful indicator of differentiating clinically between subtypes of ADHD.
WISC-IV Index Interpretation:
Results from studies conducted as part of the WISC-IV norming process illustrated that children with ADHD, whom when compared with matched controls (n=89), were found to present with significantly lower (p<.01) average scores on the Working Memory Index (5.6 points lower) and the Processing Speed Index (7.3 points lower) than their Full Scale IQ.

Evidence for the ADHD characteristics of poor working memory and processing speed is best investigated by the comparison between the individual’s own WMI and VCI, and between the PSI and PRI. The WISC-IV norming studies of individuals with ADHD have shown that they tend to score on average 3 points lower on the WMI than they do on the VCI, and 7 points lower on the PSI than the PRI.

WISC-IV Subtest Interpretation:
When compared with matched controls as part of the WISC-IV norming process, children with ADHD were found to present with significantly lower scores (p<.01) than their matched controls on Vocabulary, Comprehension, Information, Digit Span, Arithmetic, Symbol Search and Coding subtests.

In particular, large effect sizes (effect sizes indicate the substantiveness of the significant result) were found between the children with ADHD and the matched controls for (in descending order) the Coding and Arithmetic subtests. Picture Concepts (p=.80), and Similarities (p=.42) were found during the norming procedure to be the subtests least effected by ADHD.

Behavioural
During social interactions these children tend to frequently change conversation topics, to appear as though they are not listening to what others are saying, for they are tend to lose track of the conversation, as well as being easily distracted by non-relevant stimuli. These children tend to not be well liked by others, as they are often unable to follow the rules of games or social situations, they may interrupt others conversations or appear as though they are constantly trying to be the centre of attention. Children who display predominantly inattentive symptoms tend to be passive in social interactions and they tend to be ignored by their peers, rather than being actively avoided.

Children with ADHD tend to leave school early, and obtain a poorer education, than their peers. These children also tend to have fewer employment opportunities, as a consequence of a poor education, their inability to sustain their attention and being generally impulsive and overactive individuals.

Psychological
ADHD commonly co-occurs with a number of other externalising disorders, including Conduct Disorder and Oppositional Defiant Disorder, which often have similar behavioural manifestations. The child with ADHD may develop secondary oppositional behaviours, at school or when faced with tasks which require high levels of self focus, as a means of avoiding these tasks and the sense of failure associated with them. Children with ADHD often tend to place little emphasis on education and academic achievement, which can lead to difficulties and conflict, both at school and at home. The child’s behaviour can be seen by both parents and teachers as being deliberately defiant, which can lead to poor interactions between the child and adults. There is a high rate of comorbidity between ADHD and learning disorders, with one study finding that 75% of children with ADHD also had at least one learning disorder.

Children with ADHD also experience high rates of anxiety, learning, communication and depressive disorders, as well as low self esteem. ADHD is seen in around 50% of individuals diagnosed with Tourette’s Disorder, although only a small number of individual’s with ADHD will have co-morbid Tourette’s Disorder. When the two disorders are co-morbid, ADHD onset will tend to be earlier than the onset of Tourette’s Disorder.
Clinical Cohort: Learning Disorder and ADHD:

There is a high rate of comorbidity between ADHD and learning disorders, with one study finding that 75% of children with ADHD also had at least one learning disorder (Calhoun, & Dickerson Mayes, 2005). When compared with matched controls (n=45) as part of the WISC-IV norming process, children with Learning Disorder and ADHD were found to present with significantly lower (p<.01) average scores on the FSIQ (14 points lower) and all of the Indexes, in particular the WMI (12 points lower) and the PSI (12 points lower).

Evidence for poor working memory and processing speed is best investigated by the comparison between the WMI than the VCI, and between the PSI and PRI.

Studies of individuals with comorbid LD and ADHD have shown that they score on average 4 points lower on the WMI than the VCI, and 4.5 points lower on the PSI than the PRI.

Children with comorbid Learning Disorder and ADHD, whom when compared with matched controls as part of the WISC-IV norming process, were found to present with significantly lower scores (p<.01) on Similarities, Vocabulary, Information, Word Reasoning, Matrix Reasoning, Picture Completion, Letter-Number Sequencing, Digit Span, Arithmetic, Symbol Search and Coding.

Large effect sizes (effect sizes indicate the substantiveness of the significant result) were found between the children with comorbid Learning Disorder and ADHD and the matched controls for (in descending order) Arithmetic, Letter-Number Sequencing, Coding, Vocabulary, and Information.

Picture Completion (p=.12), and Cancellation (p=.08) were found to be the subtests least affected by comorbid Learning and ADHD.

The comorbid Learning Disorder and ADHD cohort was also found to score substantially lower on Digit Span Backward than Digit Span Forward.

Please note that 65 percent of the ADHD sample were on medication during the matched testing.
Clinical Cohort: Left-Handedness and Cognitive Difficulties

A study assessing handedness in pre-school children was administered to a Viennese sample of 120 children of the ages 4 to 6.5 (18 left-handed, 17 ambidextrous and 85 right-handed).

For the purpose of validation, the handedness of the children was assessed via a questionnaire given to parents, observation of the hand used to draw and testing of visual-motor skills as well as general level of development using the Viennese Development Test (WET, Kastner-Koller & Deimann, 2002).

Compared to ambidextrous and right-handed children, left-handed children were found to have significantly lower visual-motor skills.

Goez & Zelnik (2008) investigated the distribution of hand dominance in 98 children (aged 5.5-17.0 years) with developmental coordination disorder.

Thirty children (30.6%) were found to be left-handed and 13 (13.3%) were identified as ambidextrous. The prevalence of left-handedness among their parents and siblings was found to be similar to that of the general population.

The results suggest that children with developmental coordination disorder present with a higher frequency of left-hand dominance compared with the general population.

Other studies have found that left-handedness is significantly over-represented among children with Dyslexia, ADHD, Learning Disabilities, and Autism (Goez & Zelnik 2008).