PECS Example Learning Disorder Report:

John Smith
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).

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## 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: 14/04/2002  
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.

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:

Maths:  
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average

Reading:  
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average

Writing:  
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average

Spelling:  
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average

Language:  
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average

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

- Reading
- Writing
- Spelling
- Maths
- Speech and Language
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
  - Spelling – just below average
  - Grammar & Punctuation – just below average
  - Numeracy – average
- NAPLAN Year 7:
  - Reading – well below average
  - Persuasive Writing – well below average
  - Spelling – well below average
  - 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:                              Date of Administration


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.
### SOCIO-EMOTIONAL ASSESSMENT

#### Checklists Administered:

<table>
<thead>
<tr>
<th>Checklists</th>
<th>Date of Administration</th>
</tr>
</thead>
</table>

#### 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**.
Psychometric Tests Administered:

<table>
<thead>
<tr>
<th>Test</th>
<th>Date of Administration</th>
</tr>
</thead>
</table>

**WISC-IV Overview:**
The Wechsler Intelligence Scale for Children- Fourth Edition (WISC-IV) is an individually administered clinical instrument for assessing cognitive ability of children between the ages of 6 years through to 16 years 11 months.

The test provides subtest and composite scores which represent intellectual functioning in specific cognitive domains as well as a composite score which represents general intellectual ability.

The WISC-IV has Australian norms and Australian language adaptation, and it takes from 1 ½ to 2 hours to complete.

**WISC-IV Subtests:**

*Table 1: WISC-IV Subtest Descriptions*

<table>
<thead>
<tr>
<th>VERBAL COMPREHENSION</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td>The Similarities subtest involves the child being presented with two words that represent common objects or concepts and describing how they are similar. It is designed to measure verbal reasoning and concept formation. It also involves auditory comprehension, memory, distinction between non-essential and essential features, and verbal expression.</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>The Vocabulary subtest comprises both picture and verbalised items. For picture items the child names pictures that are displayed in the Stimulus Book. For verbal items the child gives definitions for words that the examiner reads aloud. Vocabulary is designed to measure a child’s word knowledge and verbal concept formation. It also measures a child’s fund of knowledge, learning ability, long-term memory, and degree of language development. Other abilities that may be used by the child during this task include auditory perception and comprehension, verbal conceptualisation, abstract thinking, and verbal expression.</td>
</tr>
<tr>
<td>Comprehension</td>
<td>The Comprehension subtest requires the child to answer questions based on their understanding of general principles and social situations. It measures verbal reasoning and conceptualisation, verbal comprehension and expression, the ability to evaluate and use past experience, and the ability to demonstrate practical information. It also involves knowledge of conventional standards of behaviour, social judgment and maturity, and common sense.</td>
</tr>
<tr>
<td>Information *</td>
<td>The Information subtest involves the child answering verbally presented questions that address a broad range of general knowledge topics. It is designed to measure a child’s ability to acquire, retain, and retrieve general factual knowledge. It involves crystallised intelligence, long-term memory, and the ability to retain and retrieve information from school and the environment. Other skills that may be used by the child include auditory perception and comprehension, and verbal expressive ability.</td>
</tr>
<tr>
<td>Word Reasoning *</td>
<td>Word Reasoning involves the child identifying the common concept being described by a series of clues. This task measures verbal comprehension, analogical and general reasoning ability, verbal abstraction, domain knowledge, the ability to integrate and synthesise different types of information, and the ability to generate alternative concepts.</td>
</tr>
</tbody>
</table>
**PERCEPTUAL REASONING**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Design</td>
<td>All items of the Block Design subtest require the child to view a constructed model or a picture in the Stimulus Book, and use red-and-white blocks to recreate the design within a specified time limit. This subtest measures the child’s ability to analyses and synthesise abstract visual stimuli. It also involves nonverbal concept formation, visual perception and organisation, simultaneous processing, visual-motor coordination, learning, and the ability to separate figure and ground in visual stimuli. The subtest also involves visual observation and matching abilities for younger children, as well as the ability to integrate visual and motor processes.</td>
</tr>
<tr>
<td>Picture Concepts</td>
<td>Picture Concepts involves the child being presented with two or three rows of pictures and them choosing one picture in each row to form a group with a common characteristic. This subtest measures abstract, categorical reasoning ability. Items are sequenced to reflect increasing demands on abstract reasoning ability.</td>
</tr>
<tr>
<td>Matrix Reasoning</td>
<td>The child views an incomplete matrix and selects the missing portion from 5 response options on the Matrix Reasoning test. It measures fluid intelligence, visual information processing ability, and abstract reasoning skill.</td>
</tr>
<tr>
<td>Picture Completion *</td>
<td>Picture Completion requires the child to view a picture and point or name the important part that is missing from the picture, within a specified time limit. It measures visual perception and organisation, concentration, and visual recognition of essential details of objects.</td>
</tr>
</tbody>
</table>

**WORKING MEMORY**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit Span</td>
<td>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.</td>
</tr>
<tr>
<td>Letter-Number Sequencing</td>
<td>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.</td>
</tr>
<tr>
<td>Arithmetic *</td>
<td>The child mentally solves a series of orally presented Arithmetic problems within a specified time limit on the Arithmetic subtest. It involves mental manipulation, concentration, attention, short-term and long-term memory, numerical reasoning ability, and mental alertness. It also involves sequencing, fluid reasoning, and logical reasoning.</td>
</tr>
</tbody>
</table>

**PROCESSING SPEED**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding</td>
<td>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.</td>
</tr>
<tr>
<td>Symbol Search</td>
<td>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.</td>
</tr>
<tr>
<td>*Cancellation *</td>
<td>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.</td>
</tr>
</tbody>
</table>

* denotes supplementary subtest which may not be administered unless deemed necessary.
**Examiner’s Details:**
EXAMINER: Dr Shane Langsford
QUALIFICATIONS: BPsysch, BEd (First Class Hons), PhD

**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></td>
<td></td>
<td></td>
<td><strong>Not Valid</strong></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 an 18+ 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 18+ 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>Coding — Symbol Search</td>
<td>-6</td>
<td>3.90</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>Symbol Search — Cancellation</td>
<td>4</td>
<td>3.83</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>5</td>
<td>8:2</td>
<td>5</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.
Table 5: WISC-IV Subtest Discrepancies From Index Subtest Mean

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Scaled Score</th>
<th>Mean Scaled Score</th>
<th>Difference From Mean</th>
<th>Critical Cutoff</th>
<th>.05 Strength or Weakness</th>
<th>Base Rate@</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptual Reasoning</td>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>Verbal Comprehension</td>
<td></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>
<td></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>
<td></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>
<td></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>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>Working Memory</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>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>Weakness</td>
</tr>
<tr>
<td>Processing Speed</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>Weakness</td>
</tr>
<tr>
<td>Symbol Search</td>
<td>9</td>
<td>12.33</td>
<td>-3.33</td>
<td>2.50</td>
<td>Weakness</td>
</tr>
<tr>
<td>*Cancellation</td>
<td>5</td>
<td>12.33</td>
<td>-7.33</td>
<td>2.50</td>
<td>Weakness</td>
</tr>
</tbody>
</table>

*Non-core subtest.

See Appendix 1 for complete subtest descriptions.

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>
<thead>
<tr>
<th>Table 7: Process Discrepancy Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subtest/Process Score</strong></td>
</tr>
<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Digit Span Forward – Digit Span Backward</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>(2) The Handwriting Speed Test (Wallen, Bonney, &amp; Lennox, 1996)</td>
<td>23/09/2015</td>
</tr>
</tbody>
</table>

WIAT-II Subtests:

Table 1: WIAT-II Subtest Descriptions

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Reading</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>Pseudoword Decoding</td>
<td>The student uses their phonetic knowledge to sound nonsense or unfamiliar words.</td>
</tr>
<tr>
<td>Reading Comprehension</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>
<tr>
<td>Numerical Operations</td>
<td>The student solves a word or stated problem requiring addition, subtraction, multiplication, and division using whole numbers, fractions, and decimals.</td>
</tr>
<tr>
<td>Spelling</td>
<td>The student spells a target word based on its meaning as it is used in a sentence.</td>
</tr>
<tr>
<td>Written Expression</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>
<tr>
<td>Listening Comprehension</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
QUALIFICATIONS: BPsych, BEd (First Class Hons), PhD

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><strong>READING</strong></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><strong>MATHEMATICS</strong></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><strong>WRITTEN LANGUAGE</strong></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><strong>ORAL LANGUAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension</td>
<td>87</td>
<td>74-100</td>
<td>19</td>
<td>&lt;12:0</td>
<td>&lt;7:0</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.
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>Weakness</td>
<td>4%</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>109</td>
<td>98</td>
<td>11</td>
<td>11.94</td>
<td>Low</td>
<td>15%</td>
</tr>
<tr>
<td>Pseudoword Decoding</td>
<td>109</td>
<td>77</td>
<td>32</td>
<td>7.55</td>
<td>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>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>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>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>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>87</td>
<td>22</td>
<td>14.01</td>
<td>Weakness</td>
<td>5-10%</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.
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:**
Green bars indicate where the WISC-IV Index score is not below the WISC-IV true ability cognitive measure.

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

Red 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.

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

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

Red bars indicate where the WIAT-II Index 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.
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:

WIAT-II

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 = 19th percentile

On the Listening Comprehension subtest, John performed particularly poorly on the Receptive Vocabulary and Expressive Vocabulary portion of the subtest.

Poor performance on the Receptive Vocabulary subtest may be a result of poor vocabulary development, lack of exposure to or experience with the words, or a Receptive Language Disorder.

Poor performance on the Expressive Vocabulary items might reflect poor vocabulary development or lack of exposure or experience, but it might also be a result of an Expressive Language Disorder

HWST
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.
ORAL READING ASSESSMENT

Test Administered:

<table>
<thead>
<tr>
<th>Test Administered:</th>
<th>Date of Administration</th>
</tr>
</thead>
</table>

GORT-5 Overview:
The Gray Oral Reading Tests – Fifth Edition (GORT-5) is an individually administered measure of oral reading ability.

The GORT-5 is a norm-referenced, reliable test that yields valid results for oral reading rate, accuracy, fluency and comprehension, for individuals’ age 6 years 0 months (6-0) through 23 years 11 months (23-11). The GORT-5 has two parallel forms (A and B), each of which contains 16 separate stories. Five comprehension questions follow each story.

The GORT-5 has four major purposes:
1. To help identify those students who are significantly behind their peers in oral reading and determine the degree of the problem.
2. To discover oral reading strengths and weaknesses within individual students.
3. To monitor students’ progress in special intervention programs.
4. To be used in research studying reading in school-aged students.

GORT-5 Scales:

<table>
<thead>
<tr>
<th>Scales</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>The Rate score is derived from the amount of time in seconds taken by a student to read a story aloud.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>The Accuracy score is derived from the number of words the student pronounces correctly when reading the passage.</td>
</tr>
<tr>
<td>Fluency</td>
<td>The Fluency score is a combination of the student’s Rate and Accuracy Scores.</td>
</tr>
<tr>
<td>Comprehension</td>
<td>The Comprehension score is the number of questions about the stories that the student answers correctly. The open-ended format ensures that the items are passage dependent.</td>
</tr>
<tr>
<td>Oral Reading Index (ORI)</td>
<td>The Oral Reading Index is a composite score formed by combining students’ Fluency (i.e. Rate and Accuracy) and Comprehension scaled scores.</td>
</tr>
</tbody>
</table>

GORT-5 Score Interpretations:
Rate, Accuracy, Fluency and Comprehension are reported as scaled scores, percentiles, grade equivalent, age equivalents, and a qualitative descriptive term.

Scaled scores have a mean of 10 and a standard deviation of 3.

The Oral Reading Index is reported as a standard score based on a distribution having a mean of 100 and a standard deviation of 15.
GORT-5 Results:

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

**Table 1: GORT-5 Performance Summary Statistics**

<table>
<thead>
<tr>
<th>GORT-5 Domain</th>
<th>Scaled Score</th>
<th>Percentile</th>
<th>Age Equivalent</th>
<th>Grade Equivalent</th>
<th>Descriptive Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>8</td>
<td>25</td>
<td>11:9</td>
<td>6:7</td>
<td>Average</td>
</tr>
<tr>
<td>Accuracy</td>
<td>7</td>
<td>16</td>
<td>10:6</td>
<td>5:4</td>
<td>Below Average</td>
</tr>
<tr>
<td>Fluency</td>
<td>7</td>
<td>16</td>
<td>10:6</td>
<td>5:4</td>
<td>Below Average</td>
</tr>
<tr>
<td>Comprehension</td>
<td>5</td>
<td>5</td>
<td>9:9</td>
<td>4:7</td>
<td>Borderline</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.

**Table 2: GORT-5 Oral Reading Index (ORI)**

<table>
<thead>
<tr>
<th>GORT-5</th>
<th>Standard Score</th>
<th>Percentile</th>
<th>Descriptive Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading Index (ORI)</td>
<td>87</td>
<td>19</td>
<td>Below Average</td>
</tr>
</tbody>
</table>

The Oral Reading Index Standard Score has a mean of 100 and a standard deviation of 15. Therefore, a Percentile Rank of 50 indicates that John performed exactly at the average level for his chronological age. ORI is not considered to be interpretable if there is a 4+ difference between the Fluency and Accuracy scaled scores.

**Table 3: WISC-IV vs GORT-5 Comparative Results**

<table>
<thead>
<tr>
<th>Composite</th>
<th>Percentile Rank</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>WISC-IV PRI</td>
<td>84</td>
<td>High Average</td>
</tr>
<tr>
<td>GORT-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GORT-5 Rate</td>
<td>25</td>
<td>Average</td>
</tr>
<tr>
<td>GORT-5 Accuracy</td>
<td>16</td>
<td>Below Average</td>
</tr>
<tr>
<td>GORT-5 Fluency</td>
<td>16</td>
<td>Below Average</td>
</tr>
<tr>
<td>GORT-5 Comprehension</td>
<td>5</td>
<td>Borderline</td>
</tr>
<tr>
<td>GORT-5 ORI</td>
<td>19</td>
<td>Below Average</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. ORI is not considered to be interpretable if there is a 4+ difference between the Fluency and Accuracy scaled scores.

**Summary:**
Comparison of John’s WISC-IV (FIQ=75th percentile) versus his GORT-5 scores suggests that John is having relative difficulty with oral reading, in particular comprehension.
Test Administered:

<table>
<thead>
<tr>
<th>Test</th>
<th>Date of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive Test of Phonological Processing (CTOPP-II)</td>
<td>23/09/2015</td>
</tr>
</tbody>
</table>

**CTOPP-II Overview:**
The CTOPP-II is an individually administered assessment battery that measures the aspects 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-II can be used for individuals aged 5 years 0 months to 24 years 11 months.

**CTOPP-II Subtests and Composites:**

<table>
<thead>
<tr>
<th>Table 1: CTOPP-II Subtests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elision (EL)</strong></td>
</tr>
<tr>
<td>This 34-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><strong>Blending Words (BW)</strong></td>
</tr>
<tr>
<td>This 33-item subtest measures an individual’s ability to combine sounds to form words.</td>
</tr>
<tr>
<td><strong>Phoneme Isolation (PI)</strong></td>
</tr>
<tr>
<td>This 32-item subtest measures the extent to which an individual can isolate different phonemes within individual words.</td>
</tr>
<tr>
<td><strong>Memory for Digits (MD)</strong></td>
</tr>
<tr>
<td>This 28-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><strong>Nonword Repetition (NR)</strong></td>
</tr>
<tr>
<td>This 30-item subtest measures an individual’s ability to repeat nonwords that range in length from 3 to 15 seconds.</td>
</tr>
<tr>
<td><strong>Rapid Digit Naming (RD)</strong></td>
</tr>
<tr>
<td>This 36-item subtest measures the speed with which an individual can name the numbers on two pages.</td>
</tr>
<tr>
<td><strong>Rapid Letter Naming (RL)</strong></td>
</tr>
<tr>
<td>This 36-item subtest measures the speed with which an individual can name the letters on two pages.</td>
</tr>
</tbody>
</table>

The six subtests from the CTOPP-II 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>
<thead>
<tr>
<th>Table 2: CTOPP-II Composites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phonological Awareness (PACS)</strong></td>
</tr>
<tr>
<td>Measures an individual’s phonological awareness – awareness of and access to the phonological structure of oral language.</td>
</tr>
<tr>
<td><strong>Phonological Memory (PMCS)</strong></td>
</tr>
<tr>
<td>Measures the examinee’s ability to code information phonologically for temporary storage in working memory or short-term memory.</td>
</tr>
<tr>
<td><strong>Rapid Naming (RNCS)</strong></td>
</tr>
<tr>
<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>
CTOPP-II Results:

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

Table 3: CTOPP-II Summary Statistics

<table>
<thead>
<tr>
<th>CTOPP-II Subtest</th>
<th>Scaled 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>Phoneme Isolation</td>
<td>7</td>
<td>16</td>
<td>10:6</td>
<td>5:4</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>Nonword Repetition</td>
<td>8</td>
<td>25</td>
<td>8:9</td>
<td>3:7</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>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.

Table 4: CTOPP-II 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.

Table 5: WISC-IV vs CTOPP-II 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-II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTOPP-II PhonologicalAwareness</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>CTOPP-II Phonological Memory</td>
<td>21</td>
<td>Below Average</td>
</tr>
<tr>
<td>CTOPP-II Rapid Naming</td>
<td>5</td>
<td>Poor</td>
</tr>
</tbody>
</table>
Figure 1: WISC-IV vs CTOPP-II Comparative Results

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

**CTOPP-II:**
John’s scores on the CTOPP-II 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-II 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-II Composite score is below the WISC-IV true ability cognitive measure, but not quite meeting statistical significance.

Green bars indicate where the CTOPP-II 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-II results:
John’s CTOPP-II 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>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
- Maths
- 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
**Socio-Emotional Assessment:**
The BYI results indicate that the areas of Self-Concept, Anxiety, Depression, Anger, and Disruptive Behaviour warrant further investigation.

**Cognitive Battery 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.

Instead, the PRI was deemed the most appropriate measure of his true cognitive ability.

John achieved index scores at the following levels:

- Verbal Comprehension Index (VCI) = 37th percentile
- Perceptual Reasoning Index (PRI) = 84th percentile
- Working Memory Index (WMI) = 6th percentile
- Processing Speed Index (PSI) = 7th percentile

The VCI, WMI, and PSI were all found to be significantly lower than PRI.

**Educational Battery Assessment:**

**WIAT-II**

**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 = 19th percentile

On the Listening Comprehension subtest, John performed particularly poorly on the Receptive Vocabulary and Expressive Vocabulary portion of the subtest.

Poor performance on the Receptive Vocabulary subtest may be a result of poor vocabulary development, lack of exposure to or experience with the words, or a Receptive Language Disorder.

Poor performance on the Expressive Vocabulary items might reflect poor vocabulary development or lack of exposure or experience, but it might also be a result of an Expressive Language Disorder.
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.

**Oral Reading Assessment:**
- GORT-5 Rate = 25th percentile
- GORT-5 Accuracy = 16th percentile
- GORT-5 Fluency = 16th percentile
- GORT-5 Comprehension = 5th percentile
- GORT-5 Oral Reading Index = 19th percentile

Comparison of John’s WISC-IV (FIQ=75th percentile) versus his GORT-5 scores suggests that John is having relative difficulty with oral reading, in particular comprehension.

**Phonological Processing Assessment:**
John’s CTOPP-II 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.
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 Appendix 1) and ICD-10 (see Appendix 1) 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.

**DEPRESSION/ANXIETY:**

Both Depression and Anxiety warrant further investigation.

**ADHD:**

John’s cognitive profile (depreciated Working Memory and Processing Speed) suggest that ADHD is a possibility and warrants further investigation/consideration.

*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.*

**ORAL LANGUAGE:**

John’s academic attainment in Listening Comprehension (Oral Language) was found to be significantly below his cognitive ability and supports the earlier concerns with language and history of Speech Therapy.
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.

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, targetted, 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.

(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).
Educational Remediation:

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

**Dyslexia SPELD Foundation - Literacy and Clinical Services:**
10 Broome Street, SOUTH PERTH WA 6051
Phone: (08) 9217 2500
www.dyslexia-speld.com

Please note, Dyslexia-SPELD has over 100 tutors across the State, and online tutoring is also available.

**Kip McGrath Education Centres:**
Offers tutoring to children from pre-school through to Year 12 in reading, spelling, comprehension, English and Mathematics.

There are Centres located in Balcatta, Booragoon, Bunbury, Busselton, Ellenbrook, Geraldton, Gosnells, Jandakot, Joondalup, Karratha, Margaret River, Mundaring, North Perth, Victoria Park, and Willetton.

In addition to the Centres, face-to-face real-time online tutoring at home is also available via webcam.

**Number Works’ n Words Subiaco:**
Offers primary and secondary school tuition for students aged between 5 and 16 years in English and Mathematics.

Lower Level Forest Centre Building
14 – 16 Rowland St, SUBIACO WA 6008
Phone: (08) 9388 3727
Email: subiaco@numberworks.com

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
3 Richardson Street, WEST PERTH WA 6005
Phone: (08) 9235 4800  Email: perth.bookshop@acer.edu.au  Website: [www.acer.edu.au](http://www.acer.edu.au)

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

(1) A current speech and language assessment is recommended. This formal speech and language assessment would help to pinpoint John’s language weakness and ensure more targeted intervention.

(2) John’s parents may wish to access the Speech Pathology Australia website for assistance with locating a Speech Pathologist. This is the national peak body for the speech pathology profession in Australia, striving for excellence and recognition for the profession and representing the interests of members and their clients with communication and swallowing difficulties.


Please note, this assessment can be organised through the school (see School Involvement) or through a private Speech Pathologist.

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.
APPENDIX 1 – DISORDER DEFINITIONS

SPECIFIC LEARNING DISORDER: DSM-5

The upcoming fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association; 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

Above information available at:

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SPECIFIC DEVELOPMENTAL DISORDERS OF SCHOLASTIC SKILLS: ICD-10

The International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10; World Health Organisation; 2016) is the standard diagnostic tool for epidemiology, health management and clinical purposes. This includes the analysis of the general health situation of population groups. It is used to monitor the incidence and prevalence of diseases and other health problems, proving a picture of the general health situation of countries and populations.

F81 Specific developmental disorders of scholastic skills
Disorders in which the normal patterns of skill acquisition are disturbed from the early stages of development. This is not simply a consequence of a lack of opportunity to learn, it is not solely a result of mental retardation, and it is not due to any form of acquired brain trauma or disease.

F81.0 Specific reading disorder
The main feature is a specific and significant impairment in the development of reading skills that is not solely accounted for by mental age, visual acuity problems, or inadequate schooling. Reading comprehension skill, reading word recognition, oral reading skill, and performance of tasks requiring reading may all be affected. Spelling difficulties are frequently associated with specific reading disorder and often remain into adolescence even after some progress in reading has been made. Specific developmental disorders of reading are commonly preceded by a history of disorders in speech or language development. Associated emotional and behavioural disturbances are common during the school age period.

F81.1 Specific spelling disorder
The main feature is a specific and significant impairment in the development of spelling skills in the absence of a history of specific reading disorder, which is not solely accounted for by low mental age, visual acuity problems, or inadequate schooling. The ability to spell orally and to write out words correctly are both affected.

F81.2 Specific disorder of arithmetical skills
Involves a specific impairment in arithmetical skills that is not solely explicable on the basis of general mental retardation or of inadequate schooling. The deficit concerns mastery of basic computational skills of addition, subtraction, multiplication, and division rather than of the more abstract mathematical skills involved in algebra, trigonometry, geometry, or calculus.

F81.3 Mixed disorder of scholastic skills
An ill-defined residual category of disorders in which both arithmetical and reading or spelling skills are significantly impaired, but in which the disorder is not solely explicable in terms of general mental retardation or of inadequate schooling. It should be used for disorders meeting the criteria for both F81.2 and either F81.0 or F81.1.

Above information available at http://apps.who.int/classifications/icd10/browse/2016/en#/F80-F89
DYSLEXIA


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".

INTERNATIONAL DYSLEXIA ASSOCIATION (http://www.interdys.org/):

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.
**DYSEXIA 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.

**DYSEXIA 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

DYSELEXIA-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.

DYSELEXIA 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: Reading Disorder

The key feature of Reading Disorder (commonly known as dyslexia) is significant impairments in reading ability (as measured via standardised testing), relative to what would be expected for the child’s age, intelligence levels and current level of education. Reading Disorder is specified in the DSM-IV-TR, with the criteria that the impairments observed in reading ability should significantly interfere with the child’s academic achievements and their ability to deal with everyday activities which rely upon reading knowledge and skills. Difficulties in reading can manifest both in oral and silent reading, with both overall slowness in reading and comprehension errors are observed. Common areas of difficulty in children with Reading Disorder include:

- Slow reading speed
- Poor comprehension
- Omission/commission errors while reading
- Reversal of words or letters while reading
- Poor sight word vocabulary
- Difficulty associating letters and syllables to specific sound (phonics)

It has been estimated that approximately 4% of children have a Reading Disorder. Reading Disorder is not usually diagnosed before year one, when the child begins to learn reading skills at a more in-depth level. The earlier that Reading Disorder is identified the better the prognosis is for the child to engage successfully in remedial classes.

Cognitive:

The performance of children with Reading Disorder was compared to matched control children on the WISC-IV, as part of the process of norm construction. The children with Reading Disorder were found to display significantly lower FSIQ scores (average 10.8 points lower) and significantly lower scores on all indexes, in particular WMI (average 12.8 points lower) and VCI (average of 9 points lower). Children with Reading Disorder were found to have WMI scores which were an average of 5 points lower than the VCI scores and 7.5 points lower than the PRI scores.

When examining performance on individual subtests, the children with Reading Disorder were found to exhibit significantly lower scores on the Similarities, Comprehension, Vocabulary, Word Reasoning, Information, Picture Completion, Matrix Reasoning, Letter-Number Sequencing, Digit Span, and Arithmetic subtests. The subtests of Cancellation, Block Design, and Picture Concepts were demonstrated to be the least effected by Reading Disorder, of all the WISC-IV subtests.

The subtests of Vocabulary, Information, Letter-Number Sequencing and Arithmetic were found to demonstrate particularly large effect sizes, when comparing the performance of children with Reading Disorders on the WISC-IV and a matched control group.

The lower scores on the Vocabulary and Information subtests are likely to be a reflection of the limited availability of information that children with impaired reading are able to acquire from reading. The lower scores on the Letter-Number Sequencing and Arithmetic subtests suggest that impairments in working memory are also seen in children who have difficulties reading. Working memory is necessary for reading, as the words which are being read have to be held in one’s mind, and then processed as a group, in order to allow for the meaning of the words and the overall writing to be fully understood and comprehended.

There are a number of measures available which assess different aspects of reading and comprehension, which can be used to determine in more detail the underlying areas of weakness in reading, which are specific to the individual child.

Behavioural:
Reading Disorder can have a wide spread impact on the child’s performance academically, with reading being an essential requirement for essentially all subjects at school. In a child with otherwise average intelligence, difficulties in reading can prevent them from achieving at their full academic potential. Studies have found that 20-55% of children with Reading Disorder have Attention Deficit/Hyperactivity Disorder (ADHD). The casual relationship between these two disorders is unclear, as ADHD could exacerbate a child’s reading difficulties (reduce their ability to focus on the task) or the ADHD may be a reaction to the child’s reading difficulties and the frustrations they are experiencing. Older children are more likely to display externalising behaviours if they have a Reading Disorder, possibly due to the long standing nature of the problems and their constant struggling to be able to read and understand.

It is important to be mindful that all child develop at different rates, thus it needs to be considered whether the child is displaying a genuine deficit in reading, as opposed to just a delayed pattern of development or low overall intelligence.

**Psychological:**
60-80% of individuals with Reading Disorders who are diagnosed are males. This bias may be a consequent of boys tending to display disruptive externalising behaviours, in response to their difficulties with reading, which teachers find more of a problem in the classroom. Girls are likely to display internalising patterns of behaviour, particularly depression, often being quiet and withdrawn at school. Conduct disorder, Oppositional Defiant Disorder and depression are all observed at higher rates in children with Reading Disorder, than the overall population, which potentially indicates that if a child presents with these disorders the possibility of impairments in reading should be investigated as potential causal variables. Self esteem and social problems are seen, as the child will be struggling in many areas at school, may have communication problems and as a consequence of poor reading, they may fail to acquire a advanced vocabulary and knowledge base from which to learn about new constructs and talk competently to their peers.
Clinical Cohort: Disorder of Written Expression and co-morbid Reading Disorder

The key feature of Disorder of Written Expression is significant impairment in a child’s writing skills (as measured via standardised testing), relative to what would be expected for the child’s age, intelligence levels and current level of education. Disorder of Written Expression is specified in the DSM-IV-TR, with the criteria that the impairments observed in writing ability should significantly interfere with the child’s academic achievements and their ability to deal with everyday activities which rely upon writing skills. Children with Disorder of Written Expression may show impairments in writing in the following areas:

- Grammatical or punctuation errors in writing
- Numerous spelling errors
- Poor paragraph organisation and formatting
- Extremely poor handwriting.

It is important to ensure that a diagnosis of Disorder of Written Expression is not given if a child displays poor quality handwriting or spelling errors, when other difficulties of written expression are not observed. Diagnosis of Disorder of Written Expression is difficult, due to there being few available standardised testing instruments which focus exclusively on assessing a child’s writing ability. Often the child is asked to copy written text, complete dictation tasks and write spontaneously, as a means of establishing a child's writing ability and whether they are performing at age and IQ appropriate levels.

Disorder of Written Expression is found to occur in conjunction with Reading Disorder in a majority of children, with its occurrence in isolation from another Learning Disorder (reading Disorder or Mathematics Disorder) being very rare. Due to this, most research and remediation programs focus on children with Disorder of Written Expression and co-morbid Reading Disorder. The disorder is also found with other language and perceptual/motor deficits. Disorder of Written Expression is not usually diagnosed until around second grade, where the child’s writing ability begins to visibly fall behind that of their peers.

Cognitive:
The performance of children with a Disorder of Written Expression and co-morbid Reading Disorder, was compared to matched control children on the WISC-IV, as part of the process of norm construction. The children with a Disorder of Written Expression and co-morbid Reading Disorder were found to present with significantly lower average scores on the FSIQ (average of 8.7 points lower) and on the WMI (average of 9.8 points) and PSI (average of 11.4 points) indices. The target children were also found to have differences between the indices of the WISC-IV, with the WMI found to be consistently lower than both the VCI (4.5 points) and the PRI (8 points).

When examining performance on individual subtests of the WISC-IV, the children with Disorder of Written Expression and co-morbid Reading Disorder were demonstrated to scores significantly lower on the Vocabulary, Information, Picture Completion, Letter-Number Sequencing, Digit Span, Arithmetic, and Coding subtests. The subtests of Arithmetic, Coding, Information, Vocabulary, Letter-Number Sequencing, and Digit Span were found to be the most informative when assessing the cognitive performance of children with Disorder of Written Expression and co-morbid Reading Disorder. The WISC-IV subtests of Picture Concepts, Cancellation, and Block Design were shown to be the subtests that were the least informative of a child’s cognitive ability if they had a Disorder of Written Expression and co-morbid Reading Disorder.

Children with Reading Disorder (in isolation) can be distinguished from children with Disorder of Written Expression and co-morbid Reading Disorder, using the WISC-IV, through examination of the child’s PSI, which appears to show a higher degree of impairment in children with the two learning disorders, rather than Reading Disorder alone.
**Behavioural & Psychological:**
As with the other Learning Disorders, Disorder of Written Expression and co-morbid Reading Disorder, children are more likely to display externalising behaviours, poor self esteem and depression as a consequence of their struggles with trying to perform tasks which they can see their peers doing with relative ease. Research has supported these children as having higher incidences of Attention Deficit/Hyperactivity Disorder (ADHD), Conduct Disorder and Oppositional Defiance Disorders, particularly boys. The casual relationship between these disorders is unclear, as ADHD could exacerbate a child’s reading and writing difficulties (reduce their ability to focus on the task) or the ADHD may be a reaction to the child’s reading and writing difficulties and the frustrations they are experiencing. Older children are more likely to display externalising behaviours if they have a Learning Disorder, possibly due to the long standing nature of the problems and their constant struggling to be able to read and understand. Self esteem and social problems are also commonly seen in these children, as they will generally struggle at school, may have communication problems and as a consequence of poor reading and writing, they may fail to acquire an advanced vocabulary and knowledge base from which to learn about new constructs.
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).