

EXAMPLE REPORT



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PECS Example Comprehensive ADHD Report:
John Smith

Strictly Confidential

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

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

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

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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 Attention-Deficit/Hyperactivity Disorder (ADHD).

CURRENT CONCERNS

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

- Academic
- Attention
- Learning
- Schoolwork/homework
- Suspected hyperactivity
- Memory

ACADEMIC AREAS

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

Maths:	<input type="checkbox"/> Well Below Average	<input type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input checked="" type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Reading:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Writing:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Spelling:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Language:	<input type="checkbox"/> Well Below Average	<input type="checkbox"/> Below Average	<input checked="" type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> 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

BRIEF BACKGROUND INFORMATION

Relevant information reported during the initial interview session:

- Was born with no apparent complications.
- Reached most of the major developmental milestones (e.g., crawling, walking, toileting) during the expected age ranges; speaking short sentences was achieved late.
- No major medical or neurological conditions.
- Normal visual and auditory acuity reported.
- No prescription medication use.
- Is a mix of right and left-handed/footed; John's older brother is left-handed.
- John's mother reported she was also late to speak, experienced similar academic difficulties during schooling and received English remediation.
- John's older brother has been diagnosed with Dyslexia and ADHD.
- Past assessments and interventions include;
 - Speech Therapy (at age 3 to 6 years) for an articulation error with /th/ sounds (e.g "fwee" for three, "bofe" for both, and "fing" for thing).
 - Occupational Therapy (at age 7 years) to help with poor coordination and pencil grip.
 - Literacy remediation (Reading Recovery Programme) since Grade 1, however, this has produced little improvement.
- Was retained in Pre-Primary due to; "not being academically ready and having obvious difficulty with speech".
- John's mother reported John;
 - Was a very active 2 to 3 year old.
 - Is very impulsive, fails to listen to or follow instructions; will not sit within a group.
 - Had problems learning the alphabet; still reverses letters and words.
 - Inaccurate and slow reading; further concerns regarding his reading comprehension.
 - Difficulties with spelling and transferring ideas onto paper (e.g. essay writing).
 - Is better at Maths than English.
 - Runs out of time during timed assessments.
- John's English teacher reported John;
 - Struggles with un-structured activities, both in the classroom and at recess and lunchtime. He fidgets constantly in the classroom, calls out, leaves his seat, and hastily completes work. He is generally interested in what is happening in the classroom and is curious about different subjects.

Past testing:

- NAPLAN Year 5:
 - Reading – just below average
 - Writing – well below average
 - 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:

<i>Test</i>	<i>Date of Administration</i>
* <i>child & adolescent psychprofiler</i> (CAPP; Langsford, Houghton & Douglas, 2014)	23/09/2015

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 comprises screening criteria that closely resemble the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (DSM-5: American Psychiatric Association: APA, 2013).

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.

ADHD BEHAVIOURAL ASSESSMENT

Checklists Administered:

<i>Checklists</i>	<i>Date of Administration</i>
(1) Conners' 3 Parent Rating Scale: Long Form (Conners 3-P, 2014)	23/09/2015
(2) Conners' 3 Teacher Rating Scale: Long Form (Conners 3-T, 2014)	23/09/2015

Conners' Subscales:

Conners' Parent and Teacher Report Subtest Descriptions

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

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

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

Conners' 3 Interpretive Guidelines:

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

Interpretive Guidelines for Conners' T-Scores and Percentiles

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

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

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

Checklist Results:

(1) Conners' 3 Parent Rating Scale:

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

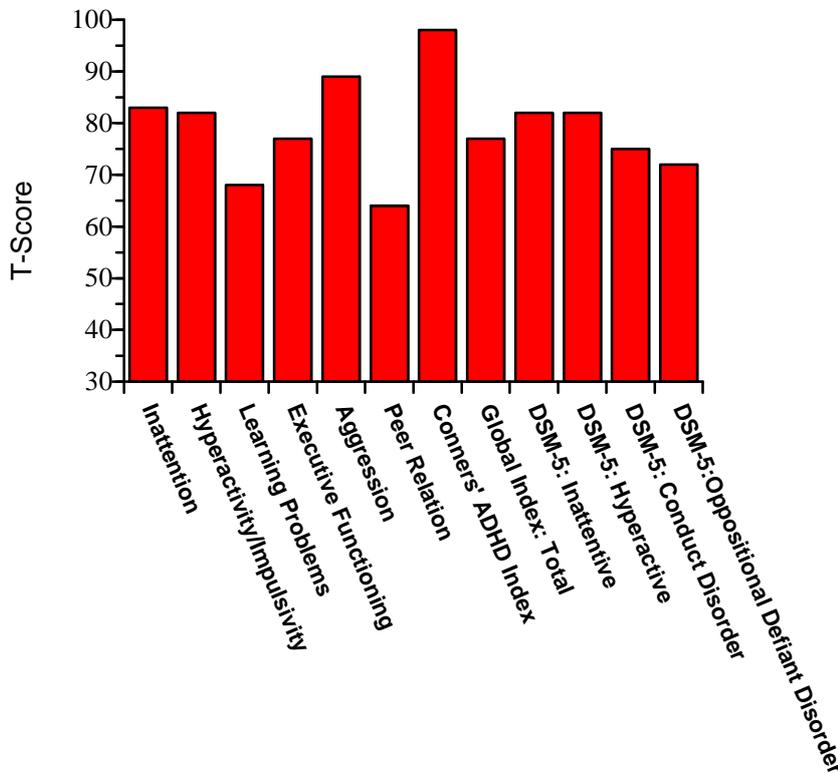
Conners' 3-P Summary Results

Conners' Subscales	T-Score*
Inattention	83
Hyperactivity/Impulsivity	82
Learning Problems	68
Executive Functioning	77
Aggression	89
Peer Relations	64
ADHD Index#	98%
Conners Global Index: Total	77
DSM-5 Symptoms: Inattentive	82
DSM-5 Symptoms: Hyperactive-Impulsive	82
DSM-5 Symptoms: Conduct Disorder	75
DSM-5 Symptoms: Oppositional Defiant Disorder	72

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

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

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



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

Although the Conners is predominantly an ADHD checklist, other conditions (e.g., depression, anxiety, autism, etc) can produce clinically elevated Index scores due to shared symptomology, therefore differential diagnosis validation is always necessary.

(2) Conners' 3 Teacher Rating Scale:

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

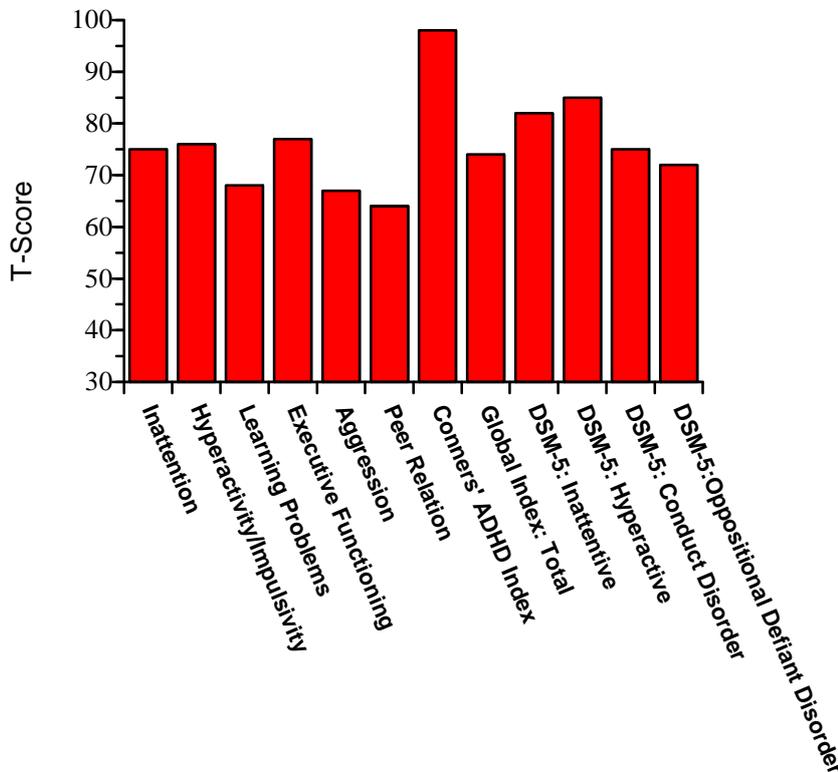
Conners' 3-T Summary Results

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

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

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

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



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

Although the Conners is predominantly an ADHD checklist, other conditions (e.g., depression, anxiety, autism, etc) can produce clinically elevated Index scores due to shared symptomology, therefore differential diagnosis validation is always necessary.

Summary of Conners' results:

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

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

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

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

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

John's mother reported that **9** ADHD-I and **6** ADHD-HI DSM-5 criteria were met.

John's teacher reported that **8** ADHD-I and **5** ADHD-HI DSM-5 criteria were met.

John's mother reported that **5** Conduct Disorder and **5** Oppositional Defiant Disorder criteria were met.

John's teacher reported that **4** Conduct Disorder and **5** Oppositional Defiant Disorder criteria were met.

SOCIO-EMOTIONAL ASSESSMENT

Checklists Administered:

<i>Checklists</i>	<i>Date of Administration</i>
Beck Youth Inventories of Emotional and Social Impairment (Beck: BYI-II: 2005)	23/09/2015

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.

BYI Subscales	Raw Score	T-Score	Interpretive Guidelines
Self-Concept	34	42	Lower than Average
Anxiety	26	62	Moderately Elevated
Depression	40	82	Extremely Elevated
Anger	31	65	Moderately Elevated
Disruptive Behaviour	22	66	Moderately Elevated

The BYI results indicate that the areas of Self-Concept, Anxiety, Depression, Anger, and Disruptive Behaviour **warrant further investigation**.

COGNITIVE ASSESSMENT

Psychometric Tests Administered:

<i>Test</i>	<i>Date of Administration</i>
Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV, 2003)	23/09/2015

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

VERBAL COMPREHENSION	
Similarities	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.
Vocabulary	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.
Comprehension	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.
Information *	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.
Word Reasoning *	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 synthesize different types of information, and the ability to generate alternative concepts.

PERCEPTUAL REASONING	
Block Design	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 analyse 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.
Picture Concepts	Picture Concepts involves the child being presented with two or three rows of pictures and then 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.
Matrix Reasoning	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.
Picture Completion *	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.
WORKING MEMORY	
Digit Span	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	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.
Arithmetic *	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.
PROCESSING SPEED	
Coding	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.
Symbol Search	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.
*Cancellation *	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.

* denotes supplementary subtest which may not be administered unless deemed necessary

Examiner's Details:

EXAMINER: Dr Shane Langsford
 QUALIFICATIONS: BPsych, 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 1: WISC-IV Index Scores

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

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

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

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

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

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

Subtests	Scaled Score	Test Age Equivalent	Percentile Rank
Verbal Comprehension Index			
Similarities	10	12:10	50
Vocabulary	8	10:6	25
Comprehension	9	11:6	37
Perceptual Reasoning Index			
Block Design	13	>16:10	84
Picture Concepts	12	>16:10	75
Matrix Reasoning	12	>16:10	75
Working Memory Index			
Digit Span	7	8:10	16
Letter-Number Sequencing	5	7:10	5
Processing Speed Index			
Coding	5	8:2	5
Symbol Search	9	11:10	37
*Cancellation	5	8:2	5

See Appendix 1 for complete subtest descriptions.

*Non-core subtest.

Table 5: WISC-IV Subtest Discrepancies From Index Subtest Mean

Subtest	Subtest Scaled Score	Mean Scaled Score	Difference From Mean	Critical Cutoff	.05 Strength or Weakness	Base Rate@
Perceptual Reasoning						
Block Design	13	12.33	0.67	2.37		>25%
Picture Concepts	12	12.33	-0.33	2.59		>25%
Matrix Reasoning	12	12.33	-0.33	2.20		>25%
Verbal Comprehension						
Similarities	10	9.00	1.00	2.43		>25%
Vocabulary	8	9.00	-1.00	2.47		>25%
Comprehension	9	9.00	0.00	2.77		>25%

@ 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.

Subtest	Subtest Scaled Score	PRI Mean Score	Difference From PRI Mean	Nominal Critical Cutoff	.05 Strength or Weakness
Working Memory					
Digit Span	7	12.33	-5.33	2.50	Weakness
Letter-Number Sequencing	5	12.33	-7.33	2.50	Weakness
Processing Speed					
Coding	3	12.33	-9.33	2.50	Weakness
Symbol Search	9	12.33	-3.33	2.50	Weakness
*Cancellation	5	12.33	-7.33	2.50	Weakness

See Appendix 1 for complete subtest descriptions.

*Non-core subtest.

Intellectual Strengths and Weaknesses:

Statistical analysis of the results revealed the following subtests to be significant (.05) cognitive strengths or weaknesses relative to John's own performance.

Strengths:

Zero significant (.05) cognitive strengths relative to John's own performance were found.

Weaknesses:

Five significant (.05) cognitive weaknesses relative to John's own performance were found; namely *Digit Span*, *Letter-Number Sequencing*, *Coding*, *Symbol Search* and *Cancellation*.

The *Digit Span* subtest is composed of two parts: Digit Span Forward and Digit Span Backward. Digit Span Forward requires John to repeat numbers in the same order as read aloud by the examiner, and the Digit Span Backward requires the child to repeat the numbers in the reverse order of that presented by the examiner. This subtest measures auditory short-term memory, sequencing skills, attention and concentration.

The Digit Span Forward task involves rote learning and memory, attention, encoding, and auditory processing. Digit Span Backward involves working memory, transformation of information, mental manipulation, and visuospatial imaging. The shift from Digit Span Forward to Digit Span Backward requires cognitive flexibility and alertness.

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

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

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

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

Table 7: Process Discrepancy Comparison

Subtest/Process Score	Forward Scaled Score	Backward Scaled Score	Difference From Mean	Critical Cutoff	Exceeds .05 Statistical Significance	Base Rate@
Digit Span Forward – Digit Span Backward	9	6	3	3.97	No	20.3%

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.

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:

Maths:	<input type="checkbox"/> Well Below Average	<input type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input checked="" type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Reading:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Writing:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Spelling:	<input type="checkbox"/> Well Below Average	<input checked="" type="checkbox"/> Below Average	<input type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> Well Above Average
Language:	<input type="checkbox"/> Well Below Average	<input type="checkbox"/> Below Average	<input checked="" type="checkbox"/> Average	<input type="checkbox"/> Above Average	<input type="checkbox"/> 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

Global Behavioural Assessment:

John self-reported positive screens for:

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

John's parents reported positive screens for:

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

John's teacher reported positive screens for:

- Attention-Deficit/Hyperactivity Disorder: Predominantly Hyperactive/Impulsive Presentation
- Language Disorder
- Oppositional Defiant Disorder
- Specific Learning Disorder – with Impairment in Reading
- Specific Learning Disorder – with Impairment in Written Expression

ADHD Behavioural Assessment:

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

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

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

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.

CONCLUSION

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

ADHD:

John's cognitive profile (depreciated Working Memory and Processing Speed), and high Conners Rating Scale behavioural results, suggest 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.

DEPRESSION/ANXIETY:

Both Depression and Anxiety warrant further investigation.

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.
- (2) John should continue regular appointments with Dr Brown as part of a multimodal intervention plan.

School Involvement:

- (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) On-going case management should be carried out by the school, and at the school's discretion, appropriate special examination arrangements (as per School Curriculum and Standards Authority guidelines) be granted to John for time-restricted tasks due to possible ADHD (Paediatrician appointment to come), and subsequent severe, Working Memory and Processing Speed Deficits.
- (4) 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) A psycho-educational test could be conducted to investigate the possibility of any Specific Learning Disorders.

Behavioural Strategies:

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

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

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

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.

<http://www.speechpathologyaustralia.org.au/>

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

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*

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

Health & Well-Being:

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

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

Dr Shane Langsford Managing Director -PECS Registered Psychologist APS College of Educational & Developmental Psychologists Academic Member	Date of Report
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CLINICAL COHORT RESEARCH FINDINGS

Clinical Cohort: Attention Deficit/Hyperactivity Disorder (Children)

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

There are three subtypes of ADHD;

- ADHD, Predominantly Inattentive Type
- ADHD; Predominantly Hyperactive-Impulsive Type
- ADHD; Combined Type

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

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

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

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

Cognitive

Research (e.g., Barkley et al., 2001; Calhoun, & Dickerson Mayes, 2005; Doyle et al., 2000; Wilcutt et al., 2001) has indicated that children with ADHD typically achieve scores near the normative range of intellectual functioning, but may perform worse on measures of processing speed and working memory, relative to measures of verbal and non-verbal abilities. This would tend to suggest that these children are more likely to display weaknesses in processing speed, basic attention, as well as writing (Calhoun, & Dickerson Mayers, 2005). Given this it is of importance to assess a child's writing ability, if they are identified as having ADHD. Children with ADD appear to have a greater level of impairment in processing speed, as measured on the WISC-III, relative to children with ADHD, suggesting that

comparison if processing speed performance may be a useful indicator of differentiating clinically between subtypes of ADHD.

WISC-IV Index Interpretation:

Results from studies conducted as part of the WISC-IV norming process illustrated that children with ADHD, when compared with matched controls ($n=89$), were found to present with significantly lower ($p<.01$) average scores on the Working Memory Index (5.6 points lower) and the Processing Speed Index (7.3 points lower) **than their Full Scale IQ**.

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

WISC-IV Subtest Interpretation:

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

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

Behavioural

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

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

Psychological

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

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

Clinical Cohort: 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).