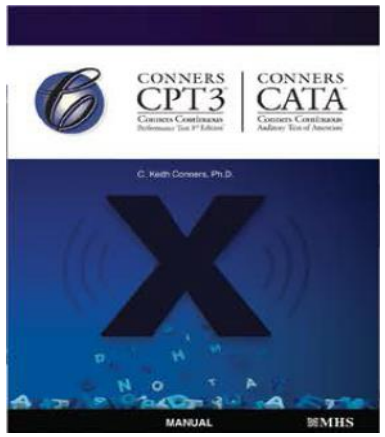
Conners CPT 3™, Conners CATA™, and Conners K-CPT 2™: Introduction and Application

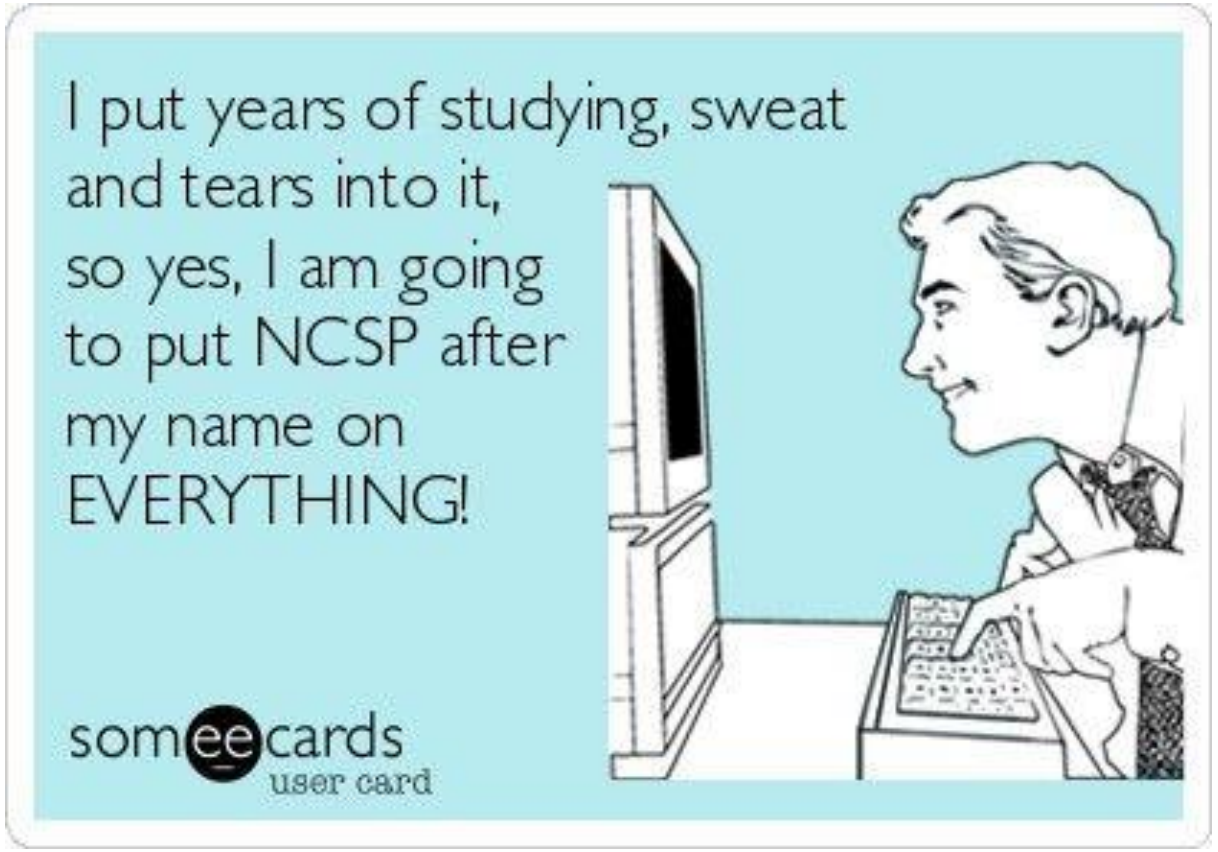


Amy Patenaude, Ed.S., NCSP

MHS Assessment Consultant ~ School Psychologist

MHS ASSESSMENTS

Your Presenter



Amy Patenaude, Ed.S., NCSP
MHS Assessment Consultant
Amy.patenaude@mhs.com

@Amy_Patenaude

https://www.linkedin.com/in/amypatenaude

Disclosure

I work for Multi-Health Systems (MHS),
the publisher of the assessment tools that we will be discussing today.
Rating scales should not be used as the sole basis
for making a diagnosis or educational eligibility decision.

Training Objectives

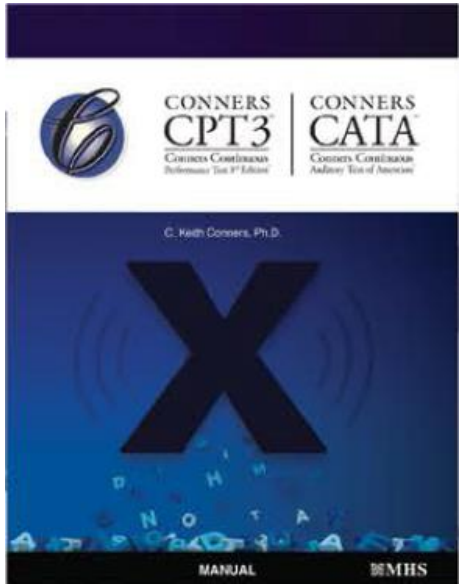
Best practices in the assessment of ADHD and EF

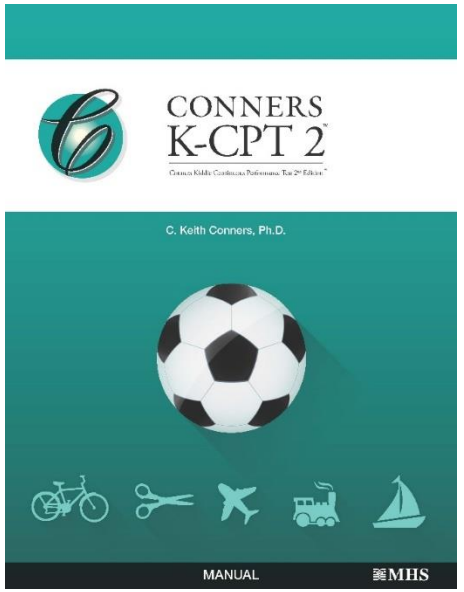
CPT 3 and CATA and their essential features

CEFI and its essential features

Case study examples

CPT3 & CATA: Key Features





MHS ASSESSMENTS

What is a Continuous Performance Test (CPT)?

- Performance/Task based assessment that measures different areas of attention such as sustained attention, inattentiveness, impulsivity, and vigilance
- Provides ***objective*** information regarding an individual's attentional difficulties
- Clients presented with repetitive boring task and must maintain their focus over a period of time in order to respond to targets or inhibit response to non-targets

Why should we be interested in utilizing the Conners CPT-3 and Conners CATA?

- Objective measure
- Performance based task: engages students/patients/clients and helps build rapport
- Helps pinpoint type of attention problem
- Increases diagnostic and classification accuracy when paired with other assessment measures

Why should I be interested in the CPT-3 and CATA?

Classification Statistic	Conners 3-P	Conners 3-P & Conners CATA	Conners 3-P & Conners CPT 3	Conners 3-P, Conners CPT 3 & Conners CATA
Overall Correct Classification (%)	83.9	88.4	88.4	93.8
Sensitivity (%)	86.0	91.2	89.5	94.7
Specificity (%)	81.8	85.5	87.3	92.7

Conners Continuous Performance Test 3rd Edition (Conners CPT 3™)

Conners CPT-3 Key Features

- Ages 8+; assesses attention related problems
- 14 minutes; in addition to 1 minute practice test
- Non-X paradigm: ignore X and respond to all other targets
- High proportion of targets to non-targets
- Varied time intervals between targets (1, 2, or 4 sec ISI)
- By-Block statistics (6 blocks with 60 trials each)
- Practice Test
- Can be part of a battery of assessments for ADHD and other disorders/neurological problems characterized by attention problems

What does the Conners CPT-3 measure?

- Assesses attention related problems
- Examines four dimensions of attention:
    1. Inattentiveness
    2. Impulsivity
    3. Sustained Attention
    4. Vigilance
- Validity Check
- Response Style Analysis:
    1. Liberal
    2. Conservative
    3. Balanced

CPT 3 Scores

Variable	Description
C	Assesses Response Style
d’	Ability to discriminate between targets (non-X) and non-targets (X)
Omissions	Missed targets (non-X)
Commissions	Incorrect responses to non-targets (X)
Perseverations	Random, repetitive, or anticipatory responses (i.e., HRT < 100ms)
Hit Reaction Time (HRT)	Response Speed
HRT SD/Variability	Response Speed Consistency
HRT Block Change	Change in HRT across blocks of trials
HRT ISI Change	Change in HRT across ISIs

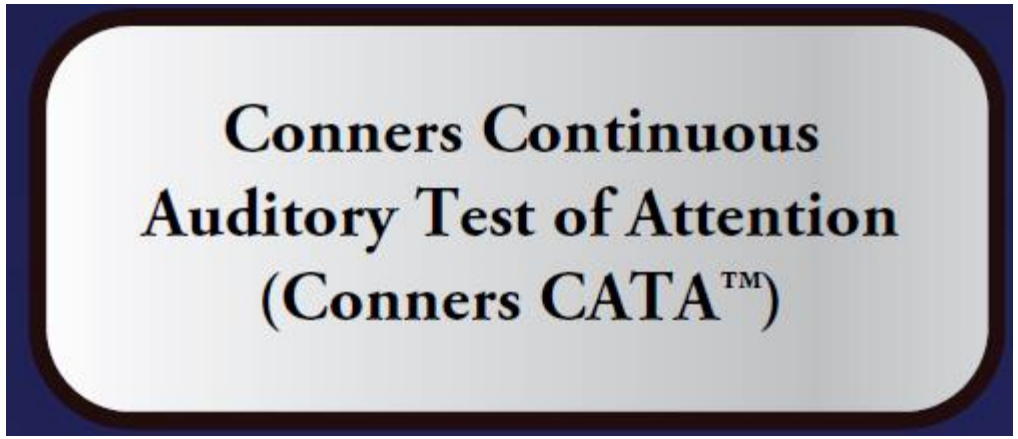
CPT-3 Scores

Dimension	Score	Description
Inattentiveness	Detectability (d')	Ability to discriminate between targets (non-X) and non-targets (X)
	Omissions	Missed targets
	Commissions	Incorrect responses to non-targets
	Hit Reaction Time (HRT)	Response speed
	HRT Standard Deviation (SD)	Response speed consistency
	Variabilty	Variabilty of response speed consistency
Impulsivity	HRT	Response speed
	Commissions	Incorrect responses to non-targets
	Perseverations	Random or anticipatory responses (i.e., HRT < 100ms)
Sustained Attention	HRT Block Change	Change in response speed across blocks of trials
	Omissions by block	Missed targets by block
	Commissions by block	Incorrect responses to non-targets by block
Vigilance	HRT Inter-Stimulus Interval (ISI) Change	Change in response speed at various ISIs
	Omissions by ISI	Missed targets by ISI
	Commissions by ISI	Incorrect responses to non-targets by ISI

Administration
Hardware and Software Requirements

- Intel Core i3 or equivalent performance (recommended)
- 2 GB Ram
- Windows XP or higher
- 1 available USB port
- 12” monitor or larger with minimum resolution of 1024 x768 pixels
- Wired mouse or keyboard

New Auditory Test of Attention



CATA Key Features

- Ages 8+
- Assesses auditory attention and attention problems
- Can be used on its own or as a compliment to the CPT-3 in an assessment battery
- 14 minutes, 200 scored trials, divided into 4 blocks
- Consists of two basic sounds: a low tone and a high tone
- On 80 percent of the trials, the low tone is played first followed by a high tone (warned trial). High tones on warned trials are the targets (AX paradigm)

CATA-Key Features

- On remaining 20 percent of the trials, a high tone is played alone without the low tone (unwarned trial). High tones on unwarned trials are non-targets.
- On most warned trials, the two tones are played sequentially in same ear (non-switch trial)
- On some warned trials, the two tones are played in opposite ears (switch trials)

What does the Conners CATA measure?

- Assesses *auditory processing* and *attention-related* problems in individuals aged 8 years and older
- Examines three dimensions of attention:
  1. Inattentiveness
  2. Impulsivity
  3. Sustained Attention
- Examines two dimensions of auditory processing:
  1. Auditory Laterality
  2. Auditory Mobility
- Validity Check
- Response Style Analysis:
  1. Liberal
  2. Conservative
  3. Balanced

Conners CATA Scores

Variable	Description
C	Assesses Response Style
d’	Ability to discriminate targets (warned high tone) from non-targets (unwarned high tone)
Omissions	Missed targets (warned high tone)
Commissions	Responded to non-targets (unwarned high tone)
Perseverative Commissions	Responded to low sound/Responded before the high sound
HRT	Hit React Time
HRT SD	Response Speed Consistency
HRT Block Change	Change in HRT across blocks
Laterality	HRT & Hits % Left vs. Right Ear (Preference for left vs. right targets)
Mobility	HRT &Hits% on Switch vs. Non Switch Trials (Ability to switch attention from one ear to another)

CATA Scores

Dimension	Score	Description
Inattentiveness	Detectability (d')	Ability to discriminate targets (warned high tone) from non-targets (unwarned high tone)
	Omissions	Missed targets
	Commissions	Incorrect responses to non-targets
	Hit Reaction Time (HRT)	Response speed
	HRT Standard Deviation (SD)	Response speed consistency
Impulsivity	HRT	Response speed
	Commissions	Incorrect responses to non-targets
	Perseverative Commissions	Incorrect responses before targets
Sustained Attention	HRT Block Change	Change in response speed across blocks of trials
	Omissions by block	Missed targets by block
	Commissions by block	Incorrect responses to non-targets by block
Auditory Laterality	HRT & Hits% Left vs. Right Ear	Preference for left vs. right targets
Auditory Mobility	HRT & Hits% on Switch vs. Non Switch Trials	Ability to switch attention from one ear to the other

Conners CPT 3 & Conners CATA

Standardization & Basic Psychometrics

Sample Descriptions

Conners CPT-3

- Normative Sample:
  - *N* = 1,400 (700 male, 700 female)
  - Spread across the ages
  - 2010 Census Match: Race, Region, (Parental) Education Level

- ADHD Sample:
  - 259 children, 97 adults
  - 62% male
  - 60% medicated

Conners CATA

- Normative Sample:
  - *N* = 1,080 (540 male, 540 female)
  - Spread across the ages
  - 2010 Census Match: Race, Region, (Parental) Education Level

- ADHD Sample:
  - 193 cases
  - 64% male
  - 63% children (age 8-17)

Conners CPT 3
Split-half Reliability

Variable Type	Measure	Normative		Clinical	
		Children	Adults	Children	Adults
		N = 775–800	N = 591–600	N = 314-349	N = 134-145
Detectability	d’	.95	.92	.95	.94
Error Type	Omissions	.94	.96	.97	.95
	Commissions	.94	.91	.92	.95
	Perseverations	.90	.73	.95	.90
Reaction Time Statistics	HRT	.99	.99	.98	.99
	HRT SD	.96	.95	.97	.97
	Variability	.80	.73	.85	.79
	Block Change	.90	.91	.80	.91
	ISI Change	.90	.93	.91	.93
Response Style	C	.87	.83	.89	.92

Conners CPT 3
Test-retest Reliability

Variable Type	Measure	Corr* N =120
Detectability	d’	.74**
Error Type	Omissions	.83**
	Commissions	.85**
	Perseverations	.48**
Reaction Time Statistics	HRT	.89**
	HRT SD	.68**
	Variability	.56**
	HRT Block Change	.12
	HRT ISI Change	.66**
Response Style	C	.63**

*Range restriction corrections applied

CATA Split-half Reliability

Variable Type	Measure	Normative		Clinical	
		Children	Adults	Children	Adults
		N = 565–600	N = 462–480	N = 109-122	N = 66-71
Detectability	d’	.97	.98	.96	.93
Error Type	Omissions	.93	.94	.98	.97
	Commissions	.99	.99	.93	.88
	Perseverations	.99	.99	.99	.99
Reaction Time Statistics	HRT	.91	.93	.98	.99
	HRT SD	.86	.90	.81	.95
	Block Change	.96	.95	.90	.92
Response Style	C	.90	.93	.91	.90

CATA Test-retest Reliability

Variable Type	Measure	Corr* N =120
Detectability	d’	.74**
Error Type	Omissions	.65**
	Commissions	.72**
	Perseverations	.95**
Reaction Time Statistics	HRT	.56**
	HRT SD	.63**
	HRT Block Change	.12
Response Style	C	.14

*Range restriction corrections applied

Conners CPT 3 - Group Differences

ADHD vs General Population

Measure		ADHD	Matched Gen. Pop.	Cohen's *d*	*p*
		N = 341-346	*N* = 340-346		
d'	*M*	**-1.9**	**-2.3**	**0.43**	**< .001**
	SD	1.0	1.0		
Omissions	*M*	**4.6**	**3.1**	**0.25**	**.001**
	SD	6.2	6.2		
Commissions	*M*	**50.1**	**43.0**	**0.35**	**< .001**
	SD	20.3	20.3		
Perseverations	*M*	**1.2**	**0.5**	**0.38**	**< .001**
	SD	1.7	1.7		
HRT	*M*	**418.7**	**410.6**	0.10	.186
	SD	80.9	80.9		
HRT SD	*M*	**0.305**	**0.258**	**0.49**	**< .001**
	SD	0.095	0.095		
Variability	*M*	**0.085**	**0.069**	**0.42**	**< .001**
	SD	0.038	0.038		
HRT Block Change	*M*	**0.008**	**0.003**	**0.21**	**.002**
	SD	0.023	0.023		
HRT ISI Change	*M*	**0.068**	**0.059**	**0.22**	**.004**
	SD	0.042	0.042		

Conners CATA - Group Differences

ADHD vs General Population

Score		ADHD	Matched General Population	*F*	*p*	Cohen's *d*
		N = 183-193	*N* = 190-193			
d'	*M*	-2.4	-3.2	36.6	< .001	0.57
	SD	1.5	1.3			
Omissions	*M*	6.8	5.4	1.2	.274	0.10
	SD	13.1	12.1			
Commissions	*M*	19.0	8.2	43.9	< .001	0.63
	SD	17.9	16.5			
Perseverative Commissions	*M*	7.7	3.8	7.6	.006	0.26
	SD	15.5	14.3			
HRT	*M*	693.6	658.1	2.9	.089	0.16
	SD	230.7	212.6			
HRT SD	*M*	0.350	0.303	13.8	< .001	0.35
	SD	0.140	0.129			
HRT Block Change	*M*	0.017	0.007	1.8	.182	0.13
	SD	0.082	0.077			

7 Step Interpretation Process

Step 1: Determine Validity of the Administration

Step 2: Review Response Style Analysis

Step 3: Examine the Overview of Scores

Step4: Review the Overall Summary and Clinical Likelihood

Step 5: Examine the Individual Dimensions of Attention

Step 6: Integrate Results with Multiple Sources

Step 7: Report Results

CASE STUDY: GRANT

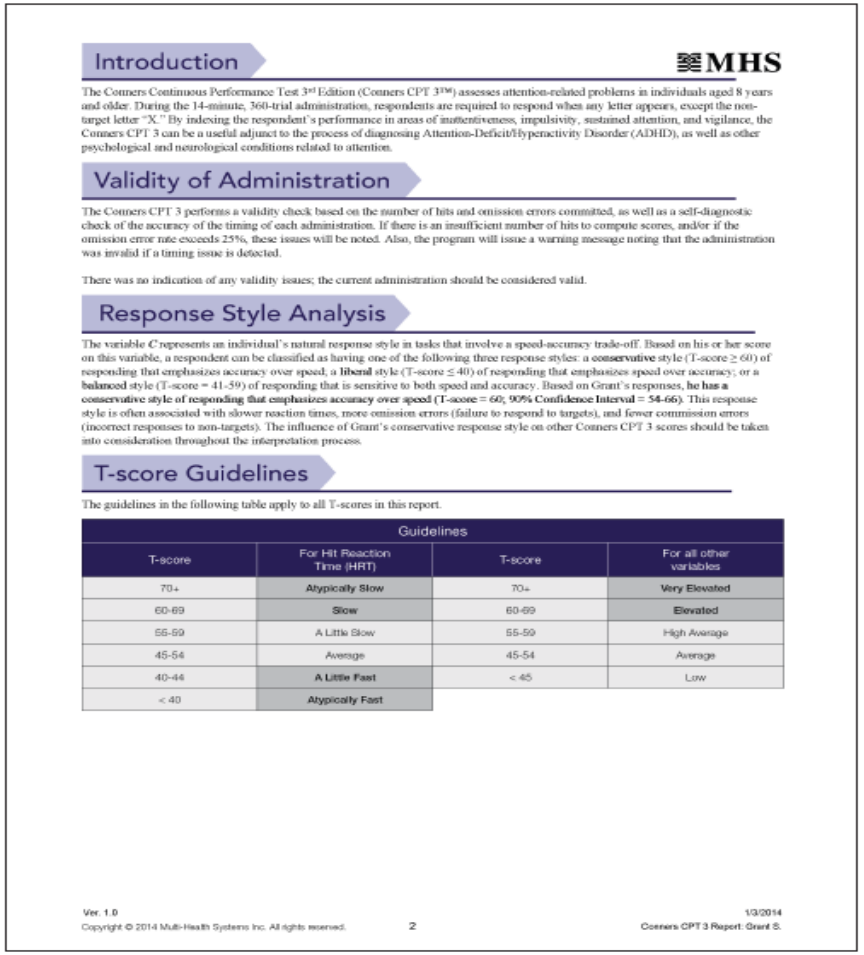
Case Study

- Grant S.
- 10-year-old boy
- Fell behind in school work
- Often seemed distracted and had problems remembering learned materials
- Some ADHD in family history
- Tested for attention deficits using CPT 3 and CATA

Assessment Plan

1. Clinician to review all available information
2. Obtain primary and differential diagnosis as well as to establish a general picture of Grant's mental and overall health status
3. Administer the following assessments: Conners CPT 3, Conners –March Developmental Questionnaire (CMDQ), Conners 3rd Edition (Conners 3-Parent, Teacher, Self), Conners CATA
4. Systematic clinical interview

Case Study



Introduction

MHS

The Conners Continuous Performance Test 3rd Edition (Conners CPT 3™) assesses attention-related problems in individuals aged 8 years and older. During the 14-minute, 360-trial administration, respondents are required to respond when any letter appears, except the non-target letter "X." By indexing the respondent's performance in areas of inattentiveness, impulsivity, sustained attention, and vigilance, the Conners CPT 3 can be a useful adjunct to the process of diagnosing Attention-Deficit/Hyperactivity Disorder (ADHD), as well as other psychological and neurological conditions related to attention.

Validity of Administration

The Conners CPT 3 performs a validity check based on the number of hits and omission errors committed, as well as a self-diagnostic check of the accuracy of the timing of each administration. If there is an insufficient number of hits to compute scores, and/or if the omission error rate exceeds 25%, these issues will be noted. Also, the program will issue a warning message noting that the administration was invalid if a timing issue is detected.

There was no indication of any validity issues; the current administration should be considered valid.

Response Style Analysis

The variable *C* represents an individual's natural response style in tasks that involve a speed-accuracy trade-off. Based on his or her score on this variable, a respondent can be classified as having one of the following three response styles: a **conservative** style (T-score ≥ 60) of responding that emphasizes accuracy over speed; a **liberal** style (T-score ≤ 40) of responding that emphasizes speed over accuracy; or a **balanced** style (T-score = 41-59) of responding that is sensitive to both speed and accuracy. Based on Grant's responses, **he has a conservative style of responding that emphasizes accuracy over speed (T-score = 60; 90% Confidence Interval = 54-66).** This response style is often associated with slower reaction times, more omission errors (failure to respond to targets), and fewer commission errors (incorrect responses to non-targets). The influence of Grant's conservative response style on other Conners CPT 3 scores should be taken into consideration throughout the interpretation process.

T-score Guidelines

The guidelines in the following table apply to all T-scores in this report.

Guidelines			
T-score	For Hit Reaction Time (HRT)	T-score	For all other variables
70+	**Atypically Slow**	70+	**Very Elevated**
60-69	**Slow**	60-69	**Elevated**
55-59	A Little Slow	55-59	High Average
45-54	Average	45-54	Average
40-44	**A Little Fast**	< 45	Low
< 40	**Atypically Fast**		

Ver. 1.0

Case Study

- Step 1: Validity of Administration

Validity of Administration

The Conners CPT 3 performs a validity check based on the number of hits and omission errors committed, as well as a self-diagnostic check of the accuracy of the timing of each administration. If there is an insufficient number of hits to compute scores, and/or if the omission error rate exceeds 25%, these issues will be noted. Also, the program will issue a warning message noting that the administration was invalid if a timing issue is detected.

There was no indication of any validity issues; the current administration should be considered valid.

Case Study

- Step 2: Response Style Analysis

Response Style Analysis

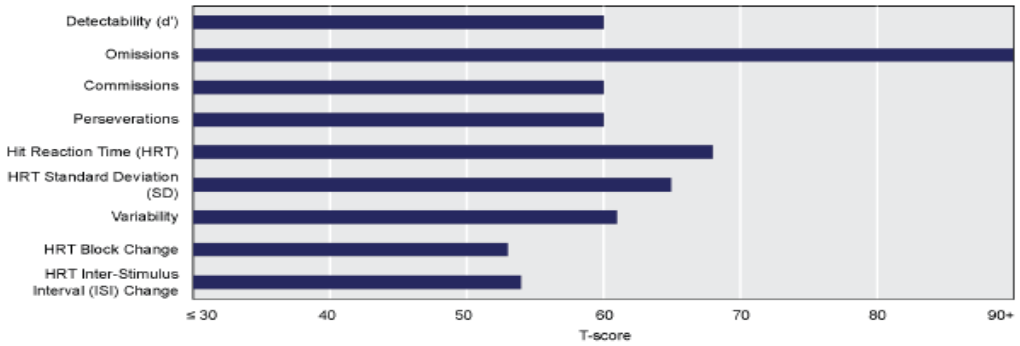
The variable ***C*** represents an individual's natural response style in tasks that involve a speed-accuracy trade-off. Based on his or her score on this variable, a respondent can be classified as having one of the following three response styles: a **conservative** style (T-score ≥ 60) of responding that emphasizes accuracy over speed; a **liberal** style (T-score ≤ 40) of responding that emphasizes speed over accuracy; or a **balanced** style (T-score = 41-59) of responding that is sensitive to both speed and accuracy. Based on Grant's responses, **he has a conservative style of responding that emphasizes accuracy over speed (T-score = 60; 90% Confidence Interval = 54-66)**. This response style is often associated with slower reaction times, more omission errors (failure to respond to targets), and fewer commission errors (incorrect responses to non-targets). The influence of Grant's conservative response style on other Conners CPT 3 scores should be taken into consideration throughout the interpretation process.

Step 3: Examine the overall profile

Overview of Conners CPT 3 Scores

MHS

This section provides an overview of Grant's Conners CPT 3 scores.



Variable Type	Measure	T-score (CI)	Percentile	Guideline	Interpretation
Detectability	d'	60 (57-63)	79th	Elevated	**Difficulty** differentiating targets from non-targets.
Error Type	Omissions	90 (86-94)	99th	Very Elevated	**Very high** rate of missed targets.
	Commissions	60 (56-64)	79th	Elevated	**High** rate of incorrect responses to non-targets.
	Perseverations	60 (55-65)	85th	Elevated	**High** rate of random, repetitive, or anticipatory responses.
Reaction Time Statistics	HRT	68 (66-70)	97th	Slow	**Slow** mean response speed.
	HRT SD	65 (62-68)	92nd	Elevated	**High inconsistency** in reaction times.
	Variability	61 (54-68)	86th	Elevated	**High** variability in reaction time consistency.
	HRT Block Change	53 (48-58)	64th	Average	**Average** change in response speed in later blocks.
	HRT ISI Change	54 (49-59)	63rd	Average	**Average** change in response speed at longer ISIs.

Note. CI = Confidence Interval.

Step 4: Clinical Likelihood Statement

Summary: Relative to the normative sample, Grant was less able to differentiate targets from non-targets, made more omission errors, made more commission errors, made more perseverative errors, responded more slowly, displayed less consistency in response speed and displayed more variability in response speed.

Overall, Grant has a total of 7 atypical T-scores, which is associated with a high likelihood of having a disorder characterized by attention deficits, such as ADHD. Note that other psychological and/or neurological conditions with symptoms of impaired attention can also lead to atypical scores on the Conners CPT 3.

Grant's profile of scores and response pattern indicates that he may have issues related to:

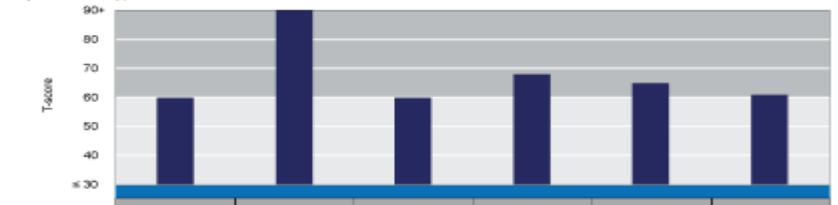
- **Inattentiveness (Strong Indication)**

Step 5: Examine the Individual Dimensions of Attention

Measures of Inattentiveness

MHS

This section summarizes Grant's scores on the inattentiveness measures and provides information about how he compares to the normative group. Indicators of inattentiveness on the Conners CPT 3 are poor Detectability (d'), a high percentage of Omissions and Commissions, a slow Hit Reaction Time (HRT), as well as high levels of inconsistency in response speed (Hit Reaction Time Standard Deviation [HRT SD] and Variability).



	Detectability (d')	Omissions	Commissions	HRT	HRT SD	Variability
T-score	60	90	60	68	65	61
Confidence Interval	57-63	86-94	56-64	66-70	62-68	54-68
Percentile	79th	99th	79th	97th	92nd	86th
Guideline	Elevated	Very Elevated	Elevated	Slow	Elevated	Elevated

Detectability (d') measures the respondent's ability to differentiate non-targets (i.e., the letter X) from targets (i.e., all other letters). Grant's T-score is 60 (90% CI = 57-63), which is ranked at the 79th percentile, and falls in the **Elevated** range. This result means that his ability to discriminate non-targets from targets was poor when compared to the normative group. Poor ability to differentiate non-targets from targets is an indicator of inattentiveness.

Omissions result from a failure to respond to targets. Grant's T-score is 90 (90% CI = 86-94), which is ranked at the 99th percentile, and falls in the **Very Elevated** range. This result means that he missed a much higher percentage of targets when compared to the normative group. Failure to respond to targets is an indicator of inattentiveness.

Commissions are made when responses are given to non-targets. Grant's T-score is 60 (90% CI = 56-64), which is ranked at the 79th percentile, and falls in the **Elevated** range. This result means that he responded to a higher percentage of non-targets when compared to the normative group. A high level of commission errors may be related to inattentiveness and/or impulsivity. The combination of Grant's slow response times (see HRT, below) and high commission errors is an indicator of inattentiveness.

HRT is the mean response speed of correct responses for the whole administration. Grant's T-score is 68 (90% CI = 66-70), which is ranked at the 97th percentile, and falls in the **Slow** range. This result means that his response speed was slower than the normative group's response speed. This may indicate that Grant was not processing targets efficiently. Note that HRT may also be affected by response style; Grant's conservative response style may have contributed to the slower response speed. See the *Response Style Analysis* section of this report for more interpretive information.

HRT SD is a measure of response speed consistency during the entire administration. Grant's T-score is 65 (90% CI = 62-68), which is ranked at the 92nd percentile, and falls in the **Elevated** range. This result means that his response speed was less consistent than the normative group. This suggests that Grant was more inattentive and processed stimuli less efficiently during some portions of the administration.

Variability, like HRT SD, is a measure of response speed consistency; however, Variability is a "within respondent" measure, that is, the amount of variability that Grant showed in 18 separate segments of the administration in relation to his own overall HRT SD. Grant's T-score is 61 (90% CI = 54-68), which is ranked at the 86th percentile, and falls in the **Elevated** range. This result means his response speed variability was higher when compared to the normative group. High response speed variability indicates that Grant's attention and information processing efficiency varied throughout the administration.

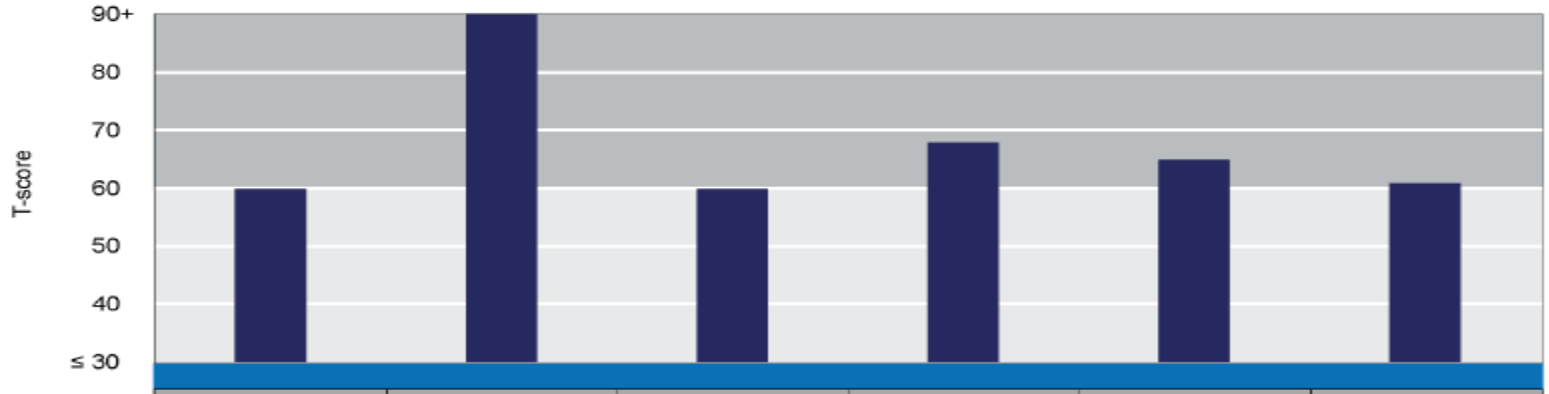
Grant's scores on these measures strongly suggest that he may have problems with inattentiveness.

Step 5: Examine the Individual Dimensions of Attention

Measures of Inattentiveness

MHS

This section summarizes Grant's scores on the inattentiveness measures and provides information about how he compares to the normative group. Indicators of inattentiveness on the Conners CPT 3 are poor Detectability (d'), a high percentage of Omissions and Commissions, a slow Hit Reaction Time (HRT), as well as high levels of inconsistency in response speed (Hit Reaction Time Standard Deviation [HRT SD] and Variability).



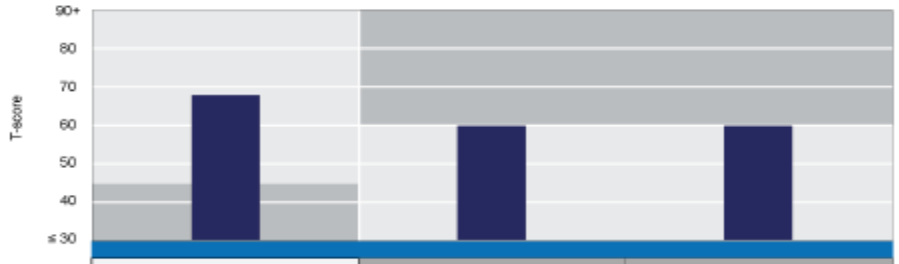
	Detectability (d')	Omissions	Commissions	HRT	HRT SD	Variability
T-score	60	90	60	68	65	61
Confidence Interval	57-63	86-94	56-64	66-70	62-68	54-68
Percentile	79th	99th	79th	97th	92nd	86th
Guideline	Elevated	Very Elevated	Elevated	Slow	Elevated	Elevated

Step 5: Examine the Individual Dimensions of Attention

Measures of Impulsivity

MHS

This section summarizes Grant's scores on the impulsivity measures and provides information about how he compares to the normative group. Indicators of impulsivity on the Conners CPT 3 include a faster than normal Hit Reaction Time (HRT) in addition to a higher than average rate of Commissions and/or Perseverations.



	HRT	Commissions	Perseverations
T-score	68	60	60
Confidence Interval	66-70	56-64	55-65
Percentile	97th	79th	85th
Guideline	Slow	Elevated	Elevated

HRT is the mean response speed of correct responses for the whole administration. Grant's T-score is 68 (90% CI = 66-70), which is ranked at the 97th percentile, and falls in the **Slow** range. This result means that his response speed was slower than the normative group's response speed. This may indicate that Grant was not processing targets efficiently. A slower than normal HRT is often related to inattentiveness rather than impulsivity. See the *Inattentiveness* section of this report for more interpretative information.

Commissions are made when responses are given to non-targets. Grant's T-score is 60 (90% CI = 56-64), which is ranked at the 79th percentile, and falls in the **Elevated** range. This result means that he responded to a higher percentage of non-targets when compared to the normative group. Commission errors may be related to impulsivity and/or inattentiveness. The combination of Grant's slow response times (see HRT, above) and high commission errors is an indicator of inattentiveness rather than impulsivity.

Perseverations are random or anticipatory responses. Grant's T-score is 60 (90% CI = 55-65), which is ranked at the 85th percentile, and falls in the **Elevated** range. This result means that he made more perseverative errors when compared to the normative group. Because Grant's response speed (see HRT, above) was slow, his perseverations are unlikely to be related to impulsivity.

Grant's scores on these measures do not indicate a problem with impulsivity.

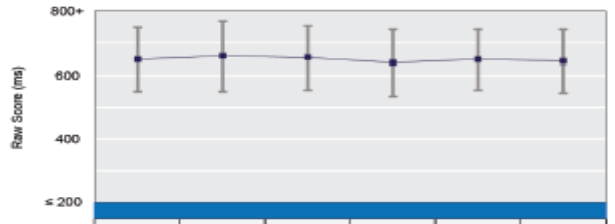
Step 5: Examine the Individual Dimensions of Attention

Measures of Sustained Attention

MHS

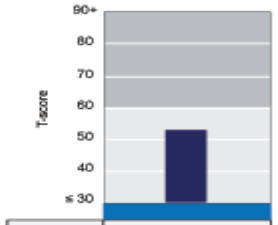
This section summarizes Grant's scores on the sustained attention measures. Sustained attention is defined as the respondent's ability to maintain attention as the administration progresses. A decrease in sustained attention across time is captured by atypical slowing in the respondent's Hit Reaction Times (HRT; as indicated by the variable HRT Block Change), as well as by increases in Omissions and Commissions in later blocks of the administration.

Hit Reaction Time by Block



	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
HRT (ms)	650	660	655	640	650	645
HRT SD (ms)	100	110	100	105	95	99

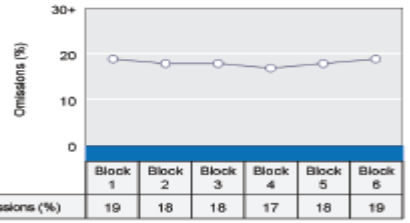
HRT Block Change



T-score (CI)	53 (48-58)ₛ
Percentile	64th
Guideline	Average

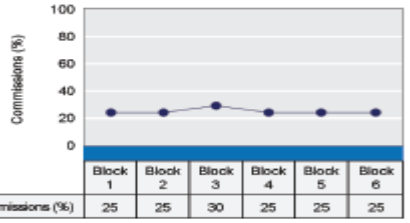
Note. ms = milliseconds; SD = Standard Deviation; CI = Confidence Interval.

Omissions by Block



	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Omissions (%)	19	18	18	17	18	19

Commissions by Block



	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Commissions (%)	25	25	30	25	25	25

Note. No statistically significant differences were found in error rates between blocks.

HRT Block Change indicates the change in mean response speed across blocks. Grant's T-score is 53 (90% CI = 48-58), which is ranked at the 64th percentile, and falls in the **Average** range. This result means that he had an average reduction in response speed in later blocks. In terms of error rates, Grant's omission and commission errors did not increase significantly across multiple adjacent blocks. **Grant's profile of scores on these measures does not indicate a problem with sustained attention.**

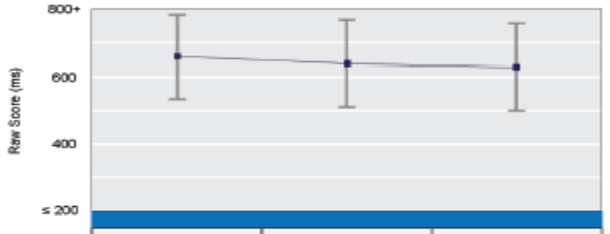
Step 5: Examine the Individual Dimensions of Attention

Measures of Vigilance

MHS

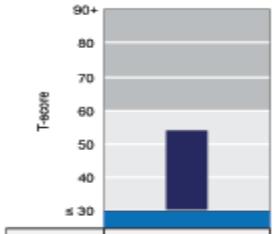
This section summarizes Grant's scores on the vigilance measures. Vigilance relates to the respondent's performance at varying levels of stimulus frequency (inter-stimulus intervals; ISIs), and is defined by the respondent's ability to maintain performance level even when the task rate is slow. This construct is captured by changes in the respondent's Hit Reaction Times (HRT), as indicated by the variable HRT ISI Change, as well as the observed pattern of Omissions and Commissions at various ISIs.

Hit Reaction Time by ISI



	1-second ISI	2-second ISI	4-second ISI
HRT (ms)	660	640	630
HRT SD (ms)	125	130	130

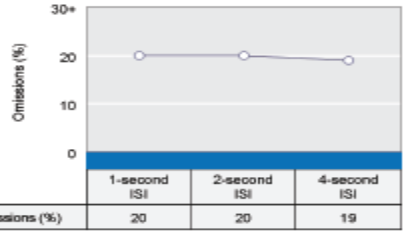
HRT ISI Change



T-score (CI)	54 (49-59)
Percentile	63rd
Guideline	Average

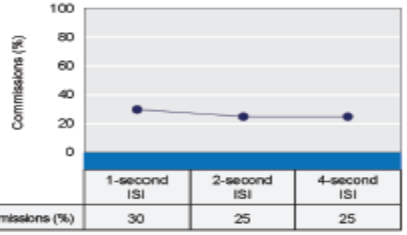
Note. ms = milliseconds; SD = Standard Deviation; CI = Confidence Interval.

Omissions by ISI



	1-second ISI	2-second ISI	4-second ISI
Omissions (%)	20	20	19

Commissions by ISI



	1-second ISI	2-second ISI	4-second ISI
Commissions (%)	30	25	25

Note. No statistically significant differences were found in error rates between ISIs.

HRT ISI Change indicates the change in mean response speed at various ISIs. Grant's T-score is 54 (90% CI = 49-59), which is ranked at the 63rd percentile, and falls in the **Average** range. This result means that he had an average reduction in response speeds at longer ISIs. There was no statistically significant increase in error rates across all three ISI levels. **Grant's profile of scores on these measures does not indicate a problem with maintaining vigilance at varying levels of stimulus frequency.**

Step 6: Integrate Results from Multiple Sources

- **CPT3:** problems with inattentiveness
- **CMDQ:** Grant's Uncle diagnosed with ADHD.
- **Conner 3 (P, T, S)**: Results suggest problems with inattention. Impairment items related to schoolwork/grades were endorsed.
- **Conners CATA:** problems with inattentiveness
- **Interview:** difficult to get Grant to conduct homework, careless when following instructions. Described Grant as shy and anxious in some situations.
- **Observations:** Observations during assessment corroborated reports.
- **Diagnosis:** Utilizing this combined information to guide diagnosis, the clinician decided that Grant met criteria for a primary diagnosis of ADHD Predominantly Inattentive Presentation.

Progress Monitoring

Table 4.9. Conners CPT 3 Pre- and Post-Treatment Scores for Grant S.

Conners CPT 3 Scores	Pre-treatment Evaluation (Time 1)		Post-treatment Evaluation (Time 2)		Statistical Change
	T-score	Classification	*T*-score	Classification	
d'	62	Elevated	58	High Average	Time 1 = Time 2
Omissions	74	Very Elevated	58	High Average	Time 1 > Time2*
Commissions	72	Very Elevated	61	Elevated	Time 1 > Time 2*
Perseverations	65	Very Elevated	54	Average	Time 1 > Time 2
HRT	68	Slow	58	A Little Slow	Time 1 > Time 2*
HRT SD	71	Very Elevated	61	Elevated	Time 1 > Time 2
Variability	65	Elevated	60	Elevated	Time 1 = Time 2
HRT Block Change	52	Average	62	Elevated	Time 1 < Time 2
HRT ISI Change	52	Average	63	Elevated	Time 1 < Time 2

Note. The "<" and ">" symbols indicate scores that are statistically significant (p <.10) and/or at least 10 *T*-score points apart. Statistically significant changes are denoted by the * symbol.

CATA Report

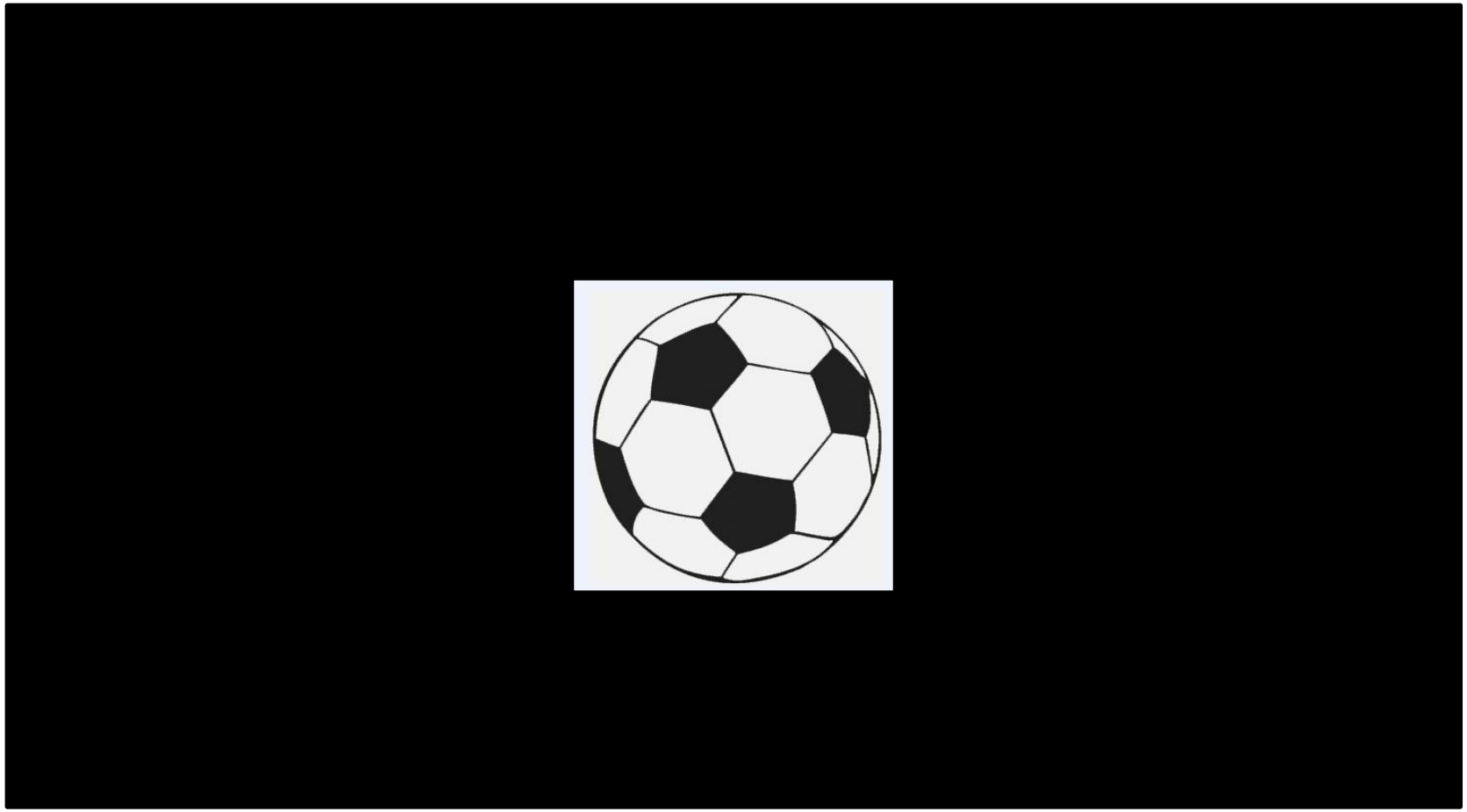
- Very similar structure to the CPT 3 report

- Offers additional information about auditory laterality and mobility

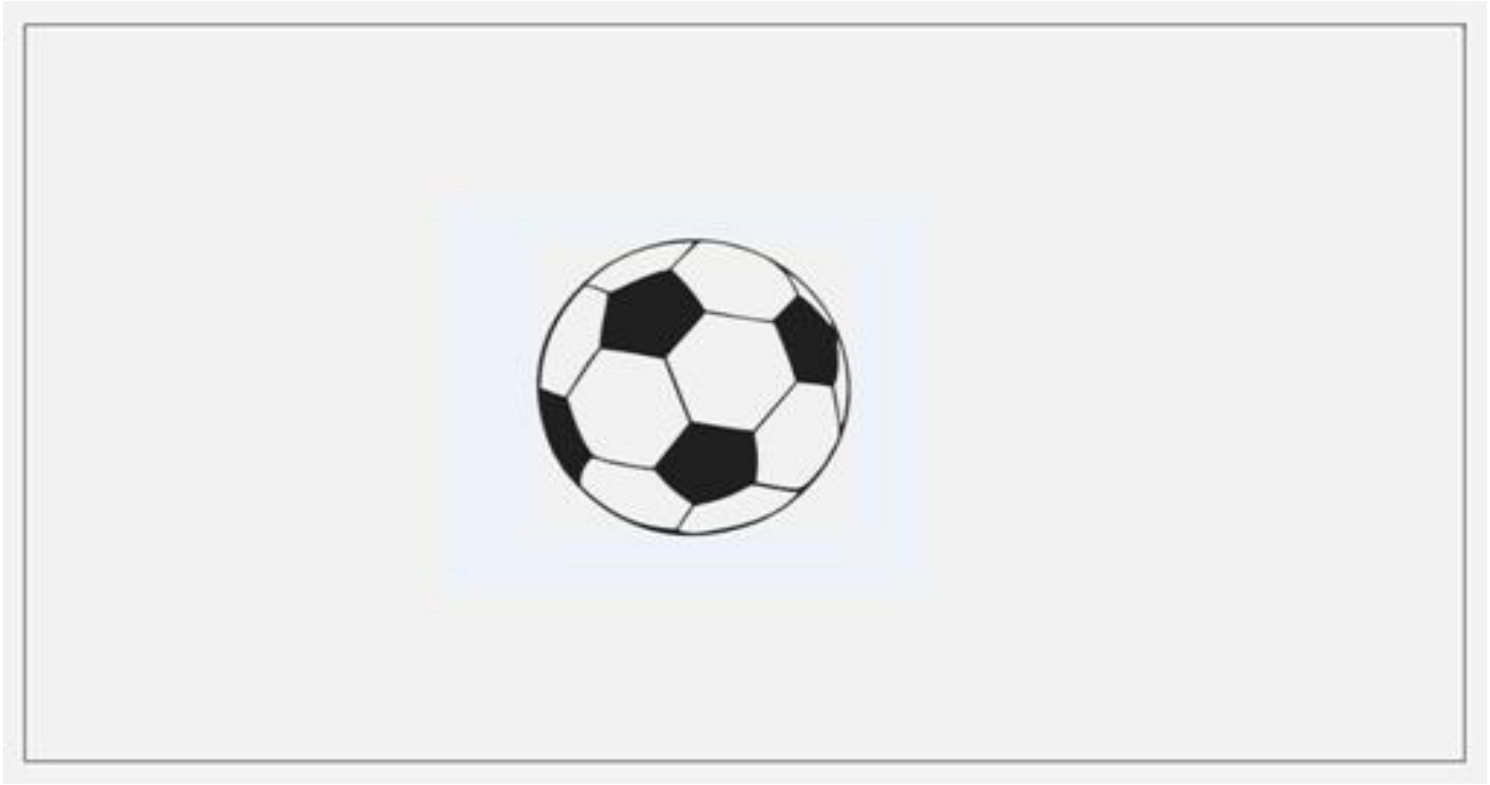
K-CPT 2

- For age 4-7
- 7.5 minutes; 200 trials + 1 dummy trial
- Pictures of objects familiar to young children.
- 75% targets (everything except soccer ball)
- Presentation speed (Inter Stimulus Interval) can vary: 1.5 or 3.0 seconds
- Results can by broken down into blocks: 5 blocks with 40 trials each
- Dimensions of Attention Measured:
  1) Inattentiveness
  2) Impulsivity
  3) Sustained Attention (new)
  4) Vigilance (new)

Old K-CPT: Black Background



K-CPT 2: White background



K-CPT 2 vs. CPT 3

	K-CPT 2	CPT 3
Admin Time	7.5 minutes	14 minutes
Stimuli	Pictures of common objects	letters
ISIs	1.5 & 3 seconds	1, 2, & 4 seconds
Stimuli Display Time	500ms	250ms

Questions about the CPT3/CATA/ KCTP2?

References

Conners, K. (2014). Conners Continuous Performance Test 3rd Edition and Conners Continuous Auditory Test of Attention: Manual. Toronto, Ontario, Canada: Multi-Health Systems.

Dawson, P. (2014). Best practices in assessing and improving executive skills. In P. Harrison, & A. Thomas, Best practices in school psychology student-level services (pp. 269-286). Bethesda, MD: National Association of School Psychologists.

Goldstein, S. & Naglieri, J. A. (2013). Comprehensive Executive Function Inventory (CEFI):Technical manual. Toronto, Ontario, Canada: Multi-Health Systems.

Tobin, R., Scheider, W. & Landau, S.(2014). Best practices in the assessment of youth with attention deficit hyperactivity disorder within a multitiered services framework. In P. Harrison, & A. Thomas, Best practices in school psychology data-based and collaborative decision making (pp. 391-404). Bethesda, MD: National Association of School Psychologists.