# Creyos Clinical Report

## Assessment Details

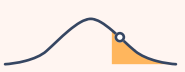
**ID:** 574983 **Birthdate:** 2017/12/31 **Group:** Females 6-7 **Date:** 2023/02/14 

## Cognitive Assessment Summary

**Cognitive Markers**
Outside Typical Range: **10**

**VADRS Questionnaire**
Hyperactive/Impulsive Subtype: **Not Indicative**
Inattentive Subtype: **Indicative**
ADHD Behaviour Markers: **Detected**

## Cognitive Assessment Results

| Task | Marker | Result | Typical Range | Percentile | Population | Description |
|---|---|---|---|---|---|---|
| **Planning**<br>Spatial Planning | Overall score | 11 | > 12 | 15 |  | Page 3 |
| **Spatial Working Memory**<br>Token Search | Average score | 4 | > 4.83 | 23 |  | Page 3 |
| **Attention**<br>Feature Match | Number of errors | 5 | < 3 | 85 |  | Page 4 |
| | Reaction time | 2491ms | > 2472ms | 20 |  | Page 4 |
| | Impulsivity | Less accurate, but not faster | | | | Page 4 |
| **Response Inhibition**<br>Double Trouble | Number of errors | 13 | < 11 | 88 |  | Page 5 |
| | Interference ratio for errors | 6 | < 5 | 85 |  | Page 5 |
| | Interference ratio for reaction time | 1.3 | < 1.0 | 90 |  | Page 5 |
| | Overall reaction time | 2721ms | < 2684ms | 87 |  | Page 5 |
| | Reaction time variability | 1387ms | < 1088ms | 35 |  | Page 5 |
| **Sustained Attention to Response Task**<br>SART | Commission errors | 19 | < 18 | 85 |  | Page 6 |
| | Omission errors | 22 | < 17 | 93 |  | Page 6 |
| | Reaction time variability | 264ms | < 215.68ms | 9 |  | Page 6 |
| | Slowing after drrors | 99ms | > -63.5ms | 45 |  | Page 6 |

## VADRS Questionnaire Results

| Measure | Result | Threshold | | Description |
|---|---|---|---|---|
| Hyperactive/Impulsive ADHD | 2 | > 5 |  | Page 2 |
| Inattentive ADHD | 6 | > 5 |  | |
| Performance Markers | 5 | ≥ 1 |  | |

The purpose of the ADHD protocol is to assist the clinician in assessing attention deficit disorder symptoms, however it is not a standalone diagnostic tool. Any conclusions drawn from the ADHD protocol should be paired with clinical interviews and observations, other mental health examinations or assessments administered, and other evaluations of the patient and/or the patient's family history.

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## Questionnaire Details

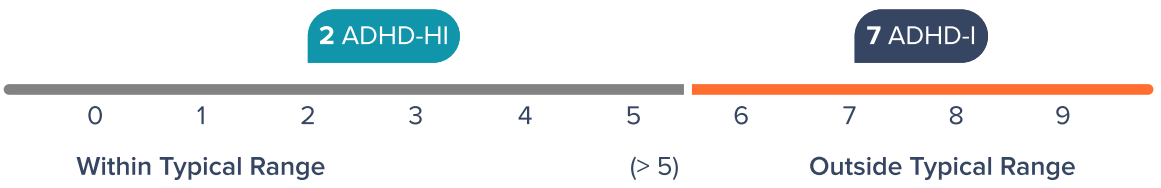


# VADRS Questionnaire

### ADHD-Related Symptoms

The Vanderbilt ADHD Diagnostic Rating Scale (VADRS) is a psychological assessment tool for attention deficit hyperactivity disorder (ADHD) symptoms. The assessment is for children aged 6 to 12.

**Indicative** of symptoms that are consistent with the Inattentive subtype of ADHD.




Collett, B. R., Ohan, J. L., & Myers, K. M. (2003). Ten-year review of rating scales. V: Scales assessing attention-deficit/ hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 42,* 1015-1037.

Wolraich, M. L., Lambert, W., Doffing, M. A., Bickman, L., Simmons, T., & Worley, K. (2003). Psychometric properties of the Vanderbilt ADHD diagnostic parent rating scale in a referred population. *Journal of Pediatric Psychology, 28,* 559-567.

#### Test Scores

**2 of 9** hyperactive/impulsive subtype (ADHD-HI)
**7 of 9** inattentive subtype (ADHD-I)
**5 of 8** ADHD behaviour markers

#### Thresholds

**6 or more** hyperactive/impulsive subtype (ADHD-HI).
**6 or more** inattentive subtype (ADHD-I).
**1 or more** ADHD behaviour markers.

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#### Symptoms

**The following activities may be more challenging for this individual, based on their responses to items in this questionnaire:**

**Hyperactive/Impulsive ADHD symptoms:**

- Fidgeting or squirming
- Staying seated
- Controlling excess movement
- Playing quietly
- Feeling overly active or compelled
- Controlling excess talking
- Reflecting before speaking
- Waiting their turn
- Entering social situations without interrupting

**Inattentive ADHD symptoms:**

- Paying attention to detail
- Sustaining attention to tasks
- Listening when spoken to
- Following instructions and finishing work
- Organizing tasks
- Engaging in tasks that require sustained mental effort
- Keeping track of necessary items
- Avoiding distraction
- Being forgetful

**Performance markers:**

- Reading level
- Math level
- Writing level
- Relations with peers
- Following rules
- Disrupting class
- Completing work
- Organization

**It is suggested that you pursue further testing related to the following comorbidities:**

- Oppositional-defiant disorder
- Conduct disorder
- Anxiety/depression

The purpose of the ADHD protocol is to assist the clinician in assessing attention deficit disorder symptoms, however it is not a standalone diagnostic tool. Any conclusions drawn from the ADHD protocol should be paired with clinical interviews and observations, other mental health examinations or assessments administered, and other evaluations of the patient and/or the patient's family history.

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## Cognitive Assessment Details

### Planning

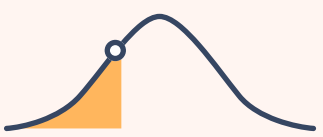
Spatial Planning

A measure of planning — the ability to act with forethought and prepare a sequence of steps to reach a goal. Common everyday activities associated with planning include:

- Deciding the order of items to pack in a trunk or moving van.
- Organizing your schedule to effectively balance work, chores, and social life.
- Planning where to put your hands and feet when rock climbing.
- Building or assembling furniture without any instructions.

**Overall Score**

Overall planning ability, indicating the ability to arrive at a planned solution quickly and accurately. Some people with ADHD perform poorly on planning tasks, but deficits may be context-dependent and inconsistent.



| | |
|---|---|
| Result | 1 |
| Typical Range | > 12 |
| Percentile | 15 |

Patros, C. H. G., Tarle, S. J., Alderson, R. M., Lea, S. E., & Arrington, E. F. (2019). Planning deficits in children with attention-deficit/hyperactivity disorder (ADHD): A meta-analytic review of tower task performance. *Neuropsychology, 33,* 425–444.

## Cognitive Assessment Details

### Spatial Working Memory

Token Search

Measures working memory — the ability to temporarily hold information in mind and manipulate or update it based on changing circumstances or demands. Common everyday activities associated with spatial working memory include:

- Systematically searching for a lost item in your home.
- Solving a mystery by remembering a set of clues, then rearranging them in your mind to tell a story and form a theory.
- Finding the most efficient way to complete a to-do list of tasks around your home before leaving in the morning.
- Efficiently navigating shifting priorities at work.

**Average Score**

The average number of items that could be stored and manipulated in memory. Spatial working memory is a key component of executive function. People with ADHD tend to be impaired on complex spatial memory tasks, indicating executive dysfunction in addition to attention-specific deficits.

| | |
|---|---|
| Result | 4 |
| Typical Range | > 4.83 |
| Percentile | 23 |

Alderson, R. M., Kasper, L. J., Hudec, K. L., & Patros, C. H. G. (2013). Attention-deficit/hyperactivity disorder (ADHD) and working memory in adults: A meta-analytic review. *Neuropsychology, 27,* 287–302.

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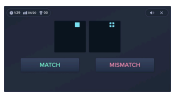



# Attention

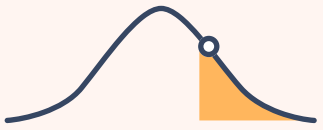
### Feature Match

A measure of attention — the ability to focus on relevant details or differences. Common everyday activities associated with attention include:

- Staying focused on a task when it counts, such as when driving.
- Identifying similarities and differences when comparing two things, such as two similar brands of a product.
- Noticing small interpersonal details, like a partner's haircut, or subtle facial expressions indicating that somebody is upset or bored.

#### Number of Errors

Inaccuracy of responses. Some people with ADHD are less accurate in simple attention tasks.



| | |
|---|---|
| Result | 12 |
| Typical Range | < 3 |
| Percentile | 85 |

Tirosh, E., Perets-Dubrovsky, S., Davidovitch, M., & Hocherman, S. (2006). Visuomotor tracking related to attention-deficit hyperactivity disorder (ADHD). *Journal of Child Neurology, 21,* 502-507.

#### Reaction Time

Speed of responding. Some people with ADHD respond faster than average to simple attention tasks.

| | |
|---|---|
| Result | 2491ms |
| Typical Range | > 2472ms |
| Percentile | 20 |

Langley, K., Marshall, L., van den Bree, M., Thomas, H., Owen, M., O'Donovan, M., & Thapar, A. (2004). Association of the dopamine D4 receptor gene 7-repeat allele with neuropsychological test performance of children with ADHD. *American Journal of Psychiatry, 161,* 133-138.

#### Impulsivity

People who respond faster and less accurately than average are considered impulsive. People with ADHD are more likely to respond quickly but inaccurately on simple attention tasks.

Result
Less accurate, but not faster

Typical Range
Below threshold on both Errors and Reaction Time

Inoue, K., Nadaoka, T., Oiji, A., Morioka, Y., Totsuka, S., Kanbayashi, Y., & Hukui, T. (1998). Clinical evaluation of attention-deficit hyperactivity disorder by objective quantitative measures. *Child Psychiatry and Human Development, 28,* 179–188.

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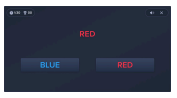



# Response Inhibition

### Double Trouble

Measures response inhibition, the ability to concentrate on relevant information in order to make a correct response despite interference. Common everyday activities associated with response inhibition include:

- Keeping your eyes on the road when driving, despite passing distracting signs or people.
- Blocking out background conversations when you're on the phone.
- Inhibiting your emotional gut reaction to a social media post to formulate a more rational response.

#### Number of Errors

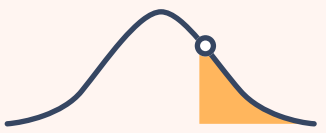
Inaccuracy of responses. People with ADHD tend to make more errors in response to all types of stimuli.

| | |
|---|---|
| Result | 13 |
| Typical Range | < 11 |
| Percentile | 88 |

Shallice, T., Marzocchi, G. M., Coser, S., Del Savio, M., Meuter, R. F., & Rumiati, R. I. (2002). Executive function profile of children with attention deficit hyperactivity disorder. *Developmental Neuropsychology, 21,* 43-71.

#### Interference Ratio for Errors

The ratio of accuracy when responding to complex stimuli vs. simple stimuli. High scores indicate a deficit specific to inhibition—that is, responding less accurately to distracting stimuli.

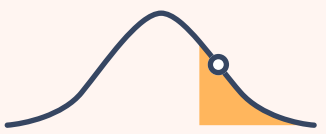


| | |
|---|---|
| Result | 6 |
| Typical Range | < 5 |
| Percentile | 85 |

Homack, S., & Riccio, C. A. (2004). A meta-analysis of the sensitivity and specificity of the Stroop Color and Word Test with children. *Archives of Clinical Neuropsychology, 19,* 725-743.

#### Interference Ratio for Reaction Time

The ratio of reaction time to complex stimuli vs. simple stimuli. High scores indicate a deficit specific to inhibition—that is, responding more slowly to distracting stimuli.

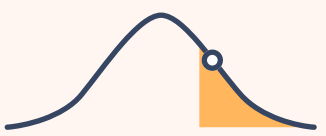


| | |
|---|---|
| Result | 1.3 |
| Typical Range | < 1.0 |
| Percentile | 90 |

Lansbergen, M. M., Kenemans, J. L., & van Engeland, H. (2007). Stroop interference and attention-deficit/hyperactivity disorder: A review and meta-analysis. *Neuropsychology, 21,* 251–262.

#### Overall Reaction Time

Speed of responding, regardless of the complexity of the stimulus. People with ADHD tend to respond slower on short-term response inhibition tasks.



| | |
|---|---|
| Result | 2721ms |
| Typical Range | < 2684ms |
| Percentile | 87 |

Pocklington, B., & Maybery, M. (2006). Proportional slowing or disinhibition in ADHD? A Brinley plot meta-analysis of Stroop Color and Word Test performance. *International Journal of Disability, Development and Education, 53,* 67-91.

#### Reaction Time Variability

Variation in response speeds. People with ADHD may occasionally lose focus, leading to inconsistent reaction times.

| | |
|---|---|
| Result | 987ms |
| Typical Range | < 1088ms |
| Percentile | 35 |

Borella, E., Ribaupierre, A., Cornoldi, C., & Chicherio, C. (2013). Beyond interference control impairment in ADHD: Evidence from increased intraindividual variability in the Color-Stroop test. *Child Neuropsychology, 19,* 495-515.

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# Sustained Attention to Response Task

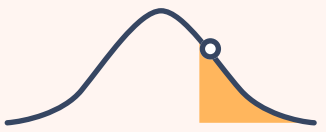
SART

SART measures the ability to sustain mindful, conscious processing of information, even in repetitive, boring, or distracting situations. Common everyday activities associated with impaired sustained attention include:

- Everyday “slips” in attention when performing routine tasks—for example, pouring cream in a requested black coffee, or throwing away the vegetables instead of their peels.
- Inappropriate or automatic responses when conditions change, such as responding “you too” when a server tells you to enjoy your food.
- Missing important information in situations that are not exciting or engaging, like classrooms or meetings.

### Commission Errors

Errors related to responding inappropriately. A measure of response inhibition. Many people with ADHD have trouble with maintaining response inhibition and tend to make more errors of this type on sustained attention tasks.

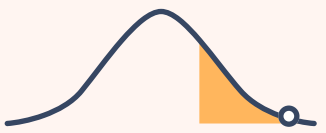


| | |
|---|---|
| Result | 19 |
| Typical Range | < 18 |
| Percentile | 85 |

Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/ hyperactivity disorder: A meta-analytic review. *Biological Psychiatry, 57,* 1336-1346.

### Omission Errors

Errors related to failing to respond at the appropriate time. A measure of vigilance. Some people with ADHD have deficits in vigilance and make more errors on sustained attention tasks.

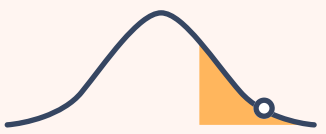


| | |
|---|---|
| Result | 22 |
| Typical Range | < 17 |
| Percentile | 93 |

Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/ hyperactivity disorder: A meta-analytic review. *Biological Psychiatry, 57,* 1336-1346.

### Reaction Time Variability

Variation in response speeds. People with ADHD may occasionally lose focus, leading to inconsistent reaction times. Variability in reaction time is consistently and strongly linked with ADHD.



| | |
|---|---|
| Result | 264ms |
| Typical Range | < 215.68ms |
| Percentile | 9 |

Klein, C., Wendling, K., Huettner, P., & Peper, M. (2006). Intra-subject variability in attention-deficit hyperactivity disorder. *Biological Psychiatry, 60,* 1088-1097.

### Slowing After Errors

The degree of slowing down after making a commission error. Most people tend to slow down and be more careful after making an error, but people with ADHD may slow down less, or even speed up after an error (indicated by a negative score).

| | |
|---|---|
| Result | 99ms |
| Typical Range | < -63.5ms |
| Percentile | 45 |

Shallice, T., Marzocchi, G. M., Coser, S., Del Savio, M., Meuter, R. F., & Rumiati, R. I. (2002). Executive function profile of children with attention deficit hyperactivity disorder. *Developmental Neuropsychology, 21,* 43-71.