# CONNERS CPT™ 3 ONLINE

Conners Continuous Performance Test™ 3rd Edition

## PRECISION MEETS PROGRESS—ASSESSING VISUAL ATTENTION

DEVELOPED BY

MHS
Beyond Assessments

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# How the Conners CPT™ 3 Online Works

The Conners Continuous Performance Test™ 3rd Edition Online (Conners CPT™ 3 Online)is a task-oriented computerized assessment of attention-related problems in individuals aged 8 years and older. By indexing the respondent's performance in areas of Inattentiveness, Impulsivity, Sustained Attention, and Vigilance, the Conners CPT 3 Online 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. The updated version of the measure transforms it from standalone software to a web application that can be accessed on multiple computers, while maintaining the psychometric properties and paradigms. Now fully digital, Conners CPT 3 Online helps you access the measure, administer, score, and generate a report from anywhere with an internet connection.

During the 14-minute, 360-trial administration, respondents are required to respond when any letter, except "X", appears. There are 6 blocks (sets of trials), with 3 sub-blocks each consisting of 20 trials. Responses from the 14-minute, 360-trial protocol are used to compute scores that assess various aspects of the respondent's attention. The Conners CPT 3 Online is a useful adjunct to the process of diagnosing disorders characterized by attention deficits, such as Attention-Deficit/ Hyperactivity Disorder (ADHD).

## Quick Reference

**Age:**
8+

**Administration:**
Individual-completed

**Administration time:**
14 minutes

**Paradigm:**
Click on non-X, ignore X

**Areas of Attention Measured:**
Inattentiveness, Impulsivity, Sustained Attention, Vigilance

**Normative Sample:**
*N*=1,400

**Format:**
Administer and Score Online

**Device Type:**
Computer/laptop

**Qualifications:**
B-level

The Conners Continuous Performance Tests offer both visual and auditory attention assessments that you can use to evaluate attention deficits and neurological functioning. The Conners CPT 3 can be used in conjunction with the Conners Continuous Auditory Test of Attention™ Online (Conners CATA® Online), which assesses auditory processing and attention-related problems for an in-depth assessment of attention in individuals aged 8 years and older. The Conners Kiddie Continuous Performance Test 2nd Edition™ Online (Conners K-CPT™ 2 Online) assesses attention-related problems in children ages 4 to 7 years. The results from the Conners CPT 3 Online can complement information obtained from standardized behavior rating scales, such as the Conners 4th Edition (Conners 4®) and the Conners Adult ADHD Rating Scales 2nd Edition (CAARS™ 2).

# Key Features

### Normative Data:

- Normed on a variety of computer models and operating systems
- Consists of 1,400 cases representative of the U.S. population

### Scores and Dimensions of Attention Measured:

- Inattentiveness
- Impulsivity
- Sustained Attention
- Vigilance

**Easy-to-understand clinical likelihood statements** based on T-scores and displayed as very high, high, moderate, or minimal.

### Digital Access:

- Easy client set up, administration, and customizable reports on the MHS Online Assessment Center+ (MAC+)
- Free digital manual
- Quick access to inventory management, account balance, and usage history

# Comprehensive Dimensions of Attention

Scores and scoring algorithms have been developed to help assessors pinpoint the nature of the respondent's attention problems. The Conners CPT 3 Online uses both standardized and raw scores to determine not only the respondent's performance overall but also in four different aspects of attention: Inattentiveness, Impulsivity, Sustained Attention, and Vigilance.

| 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 |
| | Variability | Variability 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 |

# CPT 3 Features Representative Normative Samples and Strong Psychometric Properties

The normative sample consists of 1,400 cases and is representative of the U.S. population in terms of key demographic variables such as gender, race/ethnicity, geographical region, and (parental) education level.

**Age x Gender Distribution: Conners CPT 3 Normative Sample**

| Demographic | | Male | Female | Total | |
|---|---|---|---|---|---|
| | | *N* | *N* | *N* | % |
| Ages 8-17 | 8-9 | 80 | 80 | 160 | 20.0 |
| | 10-11 | 80 | 80 | 160 | 20.0 |
| | 12-13 | 80 | 80 | 160 | 20.0 |
| | 14-15 | 80 | 80 | 160 | 20.0 |
| | 16-17 | 80 | 80 | 160 | 20.0 |
| | Total | 400 | 400 | 800 | 100.0 |
| Ages 18+ | 18-34 | 100 | 100 | 200 | 33.3 |
| | 35-59 | 110 | 110 | 220 | 36.7 |
| | 60+ | 90 | 90 | 180 | 30.0 |
| | Total | 300 | 300 | 600 | 100.0 |

**Race x (Parental) Education x Region: Conners CPT 3 Normative Sample**

| Demographic | | Ages 8-17 | | | Ages 18+ | | |
|---|---|---|---|---|---|---|---|
| | | CPT 3 | | U.S. Population | CPT 3 | | U.S. Population |
| | | *N* | % | % | *N* | % | % |
| Race/ Ethnicity | White | 442 | 55.3 | 55.1 | 402 | 67.0 | 67.0 |
| | Hispanic | 175 | 21.9 | 21.8 | 86 | 14.3 | 14.2 |
| | Black | 112 | 14.0 | 14.3 | 70 | 11.7 | 11.6 |
| | Other | 71 | 8.9 | 8.8 | 42 | 7.0 | 7.2 |
| (Parental) Education Level | High School or Less | 356 | 44.5 | 44.5 | 268 | 44.7 | 44.5 |
| | Some College | 240 | 30.0 | 30.0 | 180 | 30.0 | 30.0 |
| | College or Higher | 204 | 25.5 | 25.5 | 152 | 25.3 | 25.5 |
| Region | Northeast | 136 | 17.0 | 17.0 | 110 | 18.3 | 18.3 |
| | Midwest | 174 | 21.8 | 21.9 | 130 | 21.7 | 21.7 |
| | South | 298 | 37.3 | 37.2 | 222 | 37.0 | 37.0 |
| | West | 192 | 24.0 | 23.9 | 138 | 23.0 | 23.0 |
| Total | | 800 | 100.0 | 100.0 | 600 | 100.0 | 100.0 |

*Note.* (Parental) Education Level reflects highest level of parents' education for youth (Ages 8-17), and highest level of respondent's education for adults (Ages 18+)

# Reliability

Users can be confident that the Conners CPT 3 Online will yield consistent and stable scores across administrations.

## Internal Consistency

One measure of a test's internal consistency is split-half reliability, which has been previously used to establish the reliability of other continuous performance tests. Split-half reliability estimates of the Conners CPT 3 Online scales were calculated for the normative and clinical samples. Results were very strong—across all scores, the median split-half reliability estimate was .92 for the norm samples, and .94 for the clinical samples (all correlations were significant, $p < .001$). These results indicate that the Conners CPT 3 Online demonstrates excellent internal consistency for both the normative and the clinical groups.

## Test-Retest Reliability

Test-retest reliability refers to the consistency of scores obtained from the same respondent on separate occasions over a specified period of time. To estimate the test-retest reliability of the Conners CPT 3 Online, a sample of 120 respondents from the general population completed the Conners CPT 3 Online twice with a 1- to 5-week interval between administrations. The median test-retest correlation was .67. These results suggest a good level of test-retest reliability.

# Validity

## Discriminative Validity

Discriminative validity pertains to an instrument's ability to distinguish between relevant participant groups (i.e., the test's ability to differentiate between clinical and non-clinical groups). In order to conduct discriminative validity analyses, Conners CPT 3 Online data were collected during the standardization process from 346 children and adults who had an existing ADHD diagnosis. Conners CPT 3 Online scores from this ADHD sample were compared to a matched sample from the general population. Results indicated that significant differences were found between the ADHD sample and the matched general population sample on most measures with small to moderate effect sizes ($d = 0.10$ to $0.49$). As expected, the ADHD sample performed more poorly (i.e., they had higher scores on the Conners CPT 3 Online). In particular, the ADHD sample had lower *d'* scores, indicating more difficulty in distinguishing between relevant stimuli and distractors. Similarly, the ADHD sample made a greater number of errors (i.e., they had higher percentages of Omissions, Commissions and Perseverations than did the general population sample) and showed more variability in their responses overall (i.e., higher HRT SD scores) and across subblocks (i.e., higher Variability scores) compared to the matched sample of general population. The responses of the ADHD sample were also affected more by changes in block and ISI (i.e., higher HRT Block Change and HRT ISI Change scores).

## Incremental Validity

Another approach in establishing the Conners CPT 3 Online's validity is to show how it works together with other measures of similar constructs in the assessment of attention problems. To provide evidence for this type of validity, samples were collected in which cases were scored on the Conners CPT 3 Online and another measure of attention. Specifically, in a sample of 112 non-clinical and ADHD youth, parent-reports on the Conners 3rd Edition (Conners 3-P; Conners, 2008) were collected in addition to their scores on the Conners CPT 3 Online. In a second sample of 137 non-clinical and ADHD adults, self-reports on the Conners Adult ADHD Rating Scales (CAARS; Conners, Erhardt, & Sparrow, 1999) were collected in addition to their scores on the Conners CPT 3 Online. Logistic regressions were conducted to determine how well scores from the Conners CPT 3 Online improve the diagnostic efficacy of the scores from rating scales at predicting group membership into ADHD or general population groups. For youth, when the Conners 3-P and Conners CPT 3 Online scores were considered together, there was an overall correct classification rate (i.e., the ability to accurately predict group membership) of 88.4%, sensitivity (i.e., the ability to correctly detect ADHD cases) of 89.5%, and specificity (i.e., the ability to correctly detect general population cases) of 87.3%. These values were 4.5%, 3.5%, and 5.5%, respectively, higher than when the rating scale was used on its own. For adults, when the CAARS and Conners CPT 3 Online scores were considered together, the overall correct classification rate was 92.7%, sensitivity was 73.1%, and specificity was 97.3%. These values were 3.6%, 7.7%, and 2.7%, respectively, higher than when the rating scale was used on its own. These results indicate that adding the Conners CPT 3 Online to scores from rating scales increases the ability to predict group membership.

| Classification Statistic | Conners 3-P | Conners 3-P & Conners CPT 3 | CAARS | CAARS & Conners CPT 3 |
|---|---|---|---|---|
| Overall Correct Classification (%) | 83.9 | 88.4 | 89.1 | 92.7 |
| Sensitivity (%) | 86.0 | 89.5 | 65.4 | 73.1 |
| Specificity (%) | 81.8 | 87.3 | 94.6 | 97.3 |

# Easy-to-Interpret Reports

The computer-generated scoring reports have been designed to guide assessors through each step of the recommended interpretation process.

There are two report types available for the Conners CPT 3 Online:

The ***Assessment Report***, which provides detailed results from a single administration. An individual's scores are compared to those in the normative sample, and elevations at the scale and subscale level are indicated.

The ***Progress Report***, which provides an overview of change over time by combining and comparing results between two to four administrations. These reports are ideal to use when monitoring treatment and intervention effectiveness.

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