ADHD & Executive Functioning Measures
Conners, Brown ADDS, BRIEF, CPT-II, TEA, DBRS

Conners 3

History
Conners 3, published in 2008, is a revision of Conners’ Rating Scales–Revised (CRS–R)
Major updates were to normative data and psychometric properties
Also removed internalizing problems items
Conners 3

Multi-modal method of assessing ADHD and problem behavior in children and adolescents
Paper and pencil format
Likert-type responses (0=not true at all, 3=very much true) to statements
User qualifications:
   Anyone can administer
   Master’s level practitioner to interpret

Conners 3

Uses:
   Screening
   Monitoring treatment
   Clinical/diagnostic use (but not as a stand-alone)
   Research
Written at 6th to 9th grade reading level
Forms for 3 types of reporters:
   Parent
   Teacher
   Self

Conners 3 Content Scales

Inattention: Are likely to be inattentive, have organizational problems, have difficulty completing tasks, have concentration problems

Hyperactivity/Impulsivity: Have difficulty sitting still for very long, feel restless and impulsive

Learning Problems: Difficulties in performing academically compared to peers
Conners 3 Content Scales

Executive Functioning: problems in planning, organizing, and other EF areas

Aggression: More emotionally unstable than others their age; easily angered and irritated by those around them

Peer Relations: Are likely to perceive that they have few friends, have low self-esteem and self-confidence, feel socially detached from peers

Conners 3 Content Scales

Family Relations: Perceive parents and other family members as uncaring, harsh, or overly critical; may also feel emotionally distant or detached from family

Conners 3 DSM-IV-TR Sx Scales

ADHD Inattentive
ADHD Hyperactive-Impulsive
ADHD Combined
Conduct Disorder
Oppositional Defiant Disorder
Conners 3 Validity Scales

- Positive impression
- Negative impression
- Inconsistency index

Conners 3 Indices

Conners’ Global Index (CGI)
  - Restlessness, impulsivity, and inattentiveness

ADHD Index
  - Set of items used to distinguish ADHD children from non-ADHD children

Conners 3 Versions

Parent Scales (ages 6-18)
  - Long Version
    - 110 items; 20-25 minutes
  - Short Version
    - 45 items; 10-15 minutes

Teacher Scales (ages 6-18):
  - Long Version
    - 115 items; 20-25 minutes
  - Short Version
    - 41 items; 10-15 minutes
Conners 3 Versions

Self-Report (ages 8-18)
- Long Version
  99 items; 20-25 minutes
- Short Version (CWARS:S)
  43 items; 10-15 minutes

Conners 3 Scoring

Hand scoring and computer scoring available

Interpretation based on T-scores
M=50, SD=10

Conners 3 Norms

Almost 7000 ratings collected

Emphasis was placed on stratification and collecting data from diagnostic groups

Participants came from varied SES, demographic, and ethnic backgrounds
Conners 3 Reliability
High internal consistency (.77-.97)
Good test-retest for most subscales
Parent-teacher interrater agreement is low to moderate, but differences between home and school behavior are expected

Conners 3 Validity
Good convergent and divergent validity
Excellent content validity – items based on DSM-IV criteria
Effectively discriminates between ADHD and non-ADHD children

Conners 3
Strengths
- Strong norming population
- Multi-informant
- Short and long forms available
- Age and gender specific norms

Weaknesses
- Low interrater agreement
Brown Attention-Deficit Disorder Scales

Assesses executive cognitive functioning aspects common to ADHD, such as inattention, time management problems, slow processing speed, and poor working memory.

Administration usually oral, but can be written.

Likert-type frequency responses (0=never to 3=almost daily) to statements.

User must have completed graduate level training in tests and measurements.

Brown ADD Scales

Uses:
- Screening
- Comprehensive diagnosis
- Monitoring of treatment

Written at 6th to 9th grade reading level

Forms for:
- Primary/preschool parent and teacher (ages 3-7)
- School-age parent, teacher, and self-report (ages 8-12)
- Adolescent collateral and self-report (ages 12-18)
- Adult collateral and self-report (18+)
Brown ADD Scales

Clusters:

1. **Activation**: organizing, prioritizing, and activating to work
2. **Attention**: focusing, sustaining, and shifting attention to tasks
3. **Effort**: regulating alertness, sustaining effort, and processing speed
4. **Affect**: managing frustration and modulating emotions
5. **Memory**: utilizing working memory and accessing recall
6. **Monitoring and Self-Regulating Action** (children’s edition only)

Forms range from 40 to 50 items in length
10-20 minute administration

Scoring:

- Hand scoring (Ready Score)
- Computer scoring
- T-score threshold Interpretation:
  - <45 = ADHD possible but not likely
  - 45-59 = ADHD probable but not certain
  - 60-120 = ADHD highly probable
Brown ADD Scales

Psychometrics:
Normed on 142 clinical adults and 143 non-clinical adults
2-week test-retest on adolescents had correlation of .87
Internal consistency coefficients were .95 and .96
Good discriminate validity

Brown ADD Scales

Strengths
Found to effectively differentiate between RD and ADHD
Satisfactory interrater agreement
Weaknesses
Does not assess hyperactivity
Lack of studies
Studies use small sample sizes

Behavior Rating Inventory of Executive Function (BRIEF)
BRIEF

Designed to assess executive functioning
Paper and pencil format
Likert-type responses to statements about how frequently a behavior is a problem (1=never to 3=often)
Administrator must have graduate level tests and measurements training

BRIEF

Written at 5th grade reading level
Forms for 4 types of reporters:
  - Parent
  - Teacher
  - Self
  - Other informant

BRIEF

Uses
  Assessing preschool-aged children with difficulties such as prematurity, emerging LDs and attentional disorders, language disorders, TBIs, lead exposure, and PDD/autism
  Assessing children with LDs, low birth weight, ADHD, Tourette’s, TBI, and PDD/autism
  Assessing adults with attention disorders, LDs, autism, TBI, multiple sclerosis, depression, mild cognitive impairment, dementia, and schizophrenia
BRIEF

Scales and Indexes

- Inhibit: inhibitory control and the ability to stop one's own behavior
- Shift: ability to move between activities and problems
- Emotional Control: manifestation of executive functions within the emotional realm and ability to modulate emotional responses
- Initiate: ability to begin a task and generate ideas
- Working Memory: capacity to actively hold information in mind for the purpose of completing a task or generating a response

- Plan/Organize: ability to manage current and future-oriented task demands within the situational context
- Organization of Materials: assessment of organization in daily life with respect to orderliness of work, play, and storage spaces
- Monitor: work-check habits and the way in which a child keeps track of the effect that his or her behavior has on others
- Task Completion: ability to finish or complete tasks appropriately and in a timely manner

BRIEF

Inhibitory Self-Control Index (ISCI): ability to modulate actions, responses, emotions, and behavior via appropriate inhibitory control (Inhibit + Emotional Control)

Flexibility Index (Fi): ability to move flexibly among actions, responses, emotions, and behavior (Shift + Emotional Control)

Emergent Metacognition Index (EMI): ability to sustain ideas and activities in working memory and to plan and organize problem-solving approaches (Working Memory + Plan/Organize)
**BRIEF**

Global Executive Composite (GEC): overall summary score of executive functioning

Behavioral Regulation Index (BRI): how child regulates behavior (Inhibit + Shift + Emotional Control)

Metacognition Index (MI): how child solves problems with planning and organizational skills (Initiate + Working Memory + Plan/Organize + Organization of Materials + Monitor)

Negativity: measures unusually negative responding

Inconsistency: measures response inconsistency

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**BRIEF**

Preschool Version (BRIEF-P)

Ages 2 to 5 years

63 items; 10-15 minutes

5 scales:

1. Inhibit
2. Shift
3. Emotional Control
4. Working Memory
5. Plan/Organize

3 indexes:

1. ISI
2. EMI
3. FI

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**BRIEF**

Children’s Parent and Teacher Version (BRIEF)

Ages 5-18 years

86 items; 10-15 minutes

8 scales:

1. Inhibit
2. Shift
3. Emotional Control
4. Initiate
5. Working Memory
6. Plan/Organize
7. Organization of Materials
8. Monitor

2 indexes:

1. BRI
2. MI
**BRIEF**

**Self-Report (BRIEF-SR)**
Ages 11-18
80 items; 10-15 minutes
8 scales:
1. Inhibit
2. Shift
3. Emotional Control
4. Monitor
5. Working Memory
6. Plan/Organize
7. Organization of Materials
8. Task Completion

2 indexes:
1. BRI
2. MI

**BRIEF**

**Adult and Informant Versions (BRIEF-A)**
Ages 18-90
75 items; 10-15 minutes
9 scales:
1. Inhibit
2. Shift
3. Emotional Control
4. Initiate
5. Working Memory
6. Plan/Organize
7. Organization of Materials
8. Task Monitor
9. Self-Monitor

2 indexes:
1. BRI
2. MI

**BRIEF**

**Scoring**

Hand scoring
Computer scoring; provides:
Summary
Report
T-score interpretation
>59 = normal
60-64 = mildly elevated
65+ = significantly elevated
BRIEF

Psychometrics
BRIEF-P:
- Normed on child ratings from 460 parents and 302 teachers reflecting 1999 US census
- Internal consistency = .80-.97, test-retest reliability = .64-.94
- Good convergent and discriminant validity

BRIEF:
- Normed on child ratings from 1410 parents and 720 teachers, including children with developmental or acquired neurological disorders
- Internal consistency = .80-.98, test-retest reliability = .82-.88

BRIEF-SR:
- Normed on SR of 448 boys and 552 girls representing stratification of 2002 US census
- Internal consistency ranges from .72-.96; Test-retest reliability = .89

BRIEF-A:
- Normed on mixed clinical and healthy men and women, ages 18-90 representing stratification of 2002 US census
- Internal consistency = .80-.98, test-retest reliability = .82-.94

BRIEF

Strengths
- Norms represent US
- Contain validity scales

Weaknesses
- No emphasis on hyperactivity

Conners’ Continuous Performance Test II (CPT-II)
CPT-II
Sustained attention test
Computer-based administration; respondents are required to press the space bar or click the mouse button when any letter other than the target “X” appear.
Administrator must have graduate level tests and measurements training.

CPT-II
Uses:
- Screening tool to identify potential attention problems
- Aid in monitoring treatment effectiveness
Key areas measured:
- Response times
- Change in reaction time speed and consistency
- Signal detection theory statistics
- Overall statistics (confidence index and overall index)
- Omission errors
- Commission errors

CPT-II
Scales
- Omissions: failure to respond to target letters
- Commissions: responses are given to non-targets
- Hit Reaction Time – Overall (Hit RT): average speed of correct responses for entire test
- Standard Error – Overall (Hit RT Std Error): response speed consistency, with higher scores representing greater inconsistency
- Variability of Standard Error: within-respondent variability
- Detectability (d’): difference between signal and noise distributions; measures discriminative power
CPT-II

Response style indicator (ß): response tendency
Preservations: any reaction time less than 100 ms
Hit Reaction Time by Block (Hit RT Block Change): change in reaction time across duration of test, high scores = slowing
Standard Error Block (Hit SE Block Change): change in response consistency over duration of test; high score = loss of consistency
Reaction Time by Inter-Stimulus Interval (Hit RT ISI Change): change in average reaction times at different Inter-Stimulus Intervals
Standard Error by Inter-Stimulus Interval (Hit SE ISI Change): change in standard error of reaction times at different Inter-Stimulus Intervals

CPT-II Version 5.1 (CPT-II V.5.1)
Ages 6 and older
14 minute administration time
Target objects (a ball) are used rather than target letters

Conners’ Kiddie Continuous Performance Test Version 5 (K–CPT V.5)
Ages 4-5
7.5 minute administration time
CPT-II

Scoring:
- Computer scoring
- Produces profile report, progress report (for up to 4 administrations), and Multimodal Integrated Report (combines results with other Conners’ tests)
- T-scores available based on normal populations and an ADHD-clinical sample

CPT-II

CPT-II Norms
- Sample included 2686 people
  - 378 had ADHD
  - 223 had neurological impairment
  - 1920 were non-clinical members of the public
- K-CPT Norms
  - 454 children ages 4-5
  - 314 non-clinical
  - 100 clinical ADHD
  - 40 clinical non-ADHD

CPT-II

Psychometrics
- Split-half coefficients = .73-.95
- Significantly sensitive to attentional deficits in those with ADHD
- Good measure of true performance
CPT-II

Strengths
- True measure of performance
- Correlate well with classroom observation of inattention

Weaknesses
- Windows-only format
- Partially measures components of children’s cognitive functioning
- Low correlation with other measures of inattention and hyperactivity/impulsivity

Test of Everyday Attention (TEA)

TEA

Measure of selective attention, sustained attention, and attentional switching

Client responds to presented stimuli

Administrator must have graduate level tests and measurements training

Uses:
- Screening tool to identify potential attention problems, including those in Alzheimer’s
- Aid in monitoring treatment effectiveness
TEA

Ages 18-80; 45-60 minutes
3 parallel forms
8 subtests:
  1. Map Search – search for symbols on a colored map; 80 total with 2 minute time limit
  2. Elevator Counting – count a series of tape-presented tones
  3. Elevator Counting with Distraction – count elevator tones while ignoring higher tones
  4. Visual Elevator – count up and down while following visually presented floors
  5. Auditory Elevator with Reversal – audio version of visual elevator
  6. Telephone Search – find key symbols while searching for plumbers in simulated phone directory
  7. Telephone Search Dual Task – searches telephone directory while simultaneously counting strings of tones presented by a tape
  8. Lottery – 10-minute test during which participants must listen for their winning number, which they only know ends in “55”; task is to write down all (10) sequences ending in “55”

4 factors:
  1. Visual selective attention/speed (Map Search + Telephone Searches)
  2. Attentional Switching (Visual Elevator)
  3. Sustained Attention (Lottery + Elevator Counting)
### TEA for Children (TEA-Ch)

- **Ages**: 6-16; **60 minute administration**
- **2 parallel forms**
- **9 subtests**:
  1. **Sky Search** – rapidly and accurately circle paired “spaceship” stimuli amid a competing visual array of distracters
  2. **Score!** – silently count tones presented on tape and give correct count at end of each “game”
  3. **Creature Counting** – count “creatures” aligned along a path, where up arrows indicate need to count upwards, and down arrows downwards
  4. **Sky Search DT** – pair “spaceship” stimuli while simultaneously silently counting tones until visual search is complete
  5. **Map Mission** – search for and circle each of a specific symbol on a detailed city map within 1 minute
  6. **Score! DT** – listening to and counting taped tones while listening for an animal name distracter in a tape-recorded “news broadcast”
  7. **Walk, Don’t Walk** – learn a “go” tone and a “no-go” tone and make a mark on the answer sheet each time a “go” tone is played; speed of presentation increases as task progresses
  8. **Opposite Worlds** – read sequenced chains of numbers as they appear (same world condition) or respond with an alternate number (that is, 1 for 2 or 2 for 1) in opposite world condition and thus inhibit a prepotent verbal response
  9. **Code Transmission** – 12-minute; listening to recording of single digit numbers presented at 2 second intervals in order to respond with the number that precedes the occurrence of all double 5-digit sequences; 40 target presentations

### Factors:

- **Sustained Attention**: (Score! + Score! DT + Code Transmission + Walk, Don’t Walk + Sky Search DT)
- **Selective Attention**: (Sky Search + Map Mission)
- **Attentional Control**: (Creature Counting + Opposite Worlds)
TEA

Scoring
- Hand scoring
- Normative tables used for conversion into scaled scores
- Interpret scores with $M=10$ and $SD=3$

Norms
- TEA normed on 154 healthy UK controls, ages 18-80, with varying levels of educational attainment
- TEA-Ch normed on 146 healthy males and 147 healthy females ages 6-16 years old

Psychometrics:
- Good test-retest reliability
- Satisfactory construct validity
- Good discriminatory validity

Strengths
- Tasks simulate daily activities
- Game-like format keeps children engaged
- Sensitive to changes in stimulant medication

Weaknesses:
- Few studies
- Small sample sizes
Disruptive Behavior Rating Scale

DBRS

- Identifies common behavior problems
- Paper and pencil administration
- 4-point Likert-type frequency response (0=rarely to 3=most of the time) to statements about behavior
- Administrator must have Masters degree

- Used primarily for assessment of ADHD, ODD, and CD
- 3 Versions:
  - Mother (DBRS-P)
  - Father (DBRS-P)
  - Teacher (DBRS-T)
- 50 items, 5-10 minutes
- Ages 5-10
DBRS

7 sub-scales:
- Distractible
- Organization
- Impulsive
- Hyperactive
- 5. Oppositional
- 6. Aggressive
- 7. Conduct Problems

• 4 factors:
  1. Distractible (Distractible + Organization)
  2. Oppositional (Oppositional + Aggressive)
  3. Impulsive-Hyperactive (Impulsive + Hyperactive)
  4. Antisocial Conduct (Impulsive + Aggressive + Conduct Problems)

DBRS

Scoring
- Hand scoring
- Computer scoring
- Interpretation based on T-scores, M=50, SD=10

Norms:
- Teachers of 1766 children, mothers of 1399 children, and fathers of 1252 children
- All from Central VA
- Caucasian and “other”

DBRS

Reliability
- Test-retest = .65-.92 for mothers, .68-.92 for fathers, and .90-.49 for teachers
- Internal consistency = .67-.95 for mothers, .72-.95 for fathers, and .54-.96 for teachers

Validity
- Acceptable criterion validity
DBRS

Strengths
Wording of parent and teacher forms are almost identical, allowing for more valid comparison
Scale items specifically written to allow direct teacher transfer to behavior-modification plans, IEPs, or 504 plans
Separate norms exist for mothers, fathers, and teachers

Weaknesses
Antisocial Conduct factor contributes little to scale
Very narrow normative sample