

## ADHD & Executive Functioning Measures

Conners, Brown ADDS, BRIEF, CPT-II,  
TEA, DBRS

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## Conners 3



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## 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

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### 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

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### Conners 3

Uses:

Screening

Monitoring treatment

Clinical/diagnostic use (but not as a stand-alone)

Research

Written at 6<sup>th</sup> to 9<sup>th</sup> grade reading level

Forms for 3 types of reporters:

Parent

Teacher

Self

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### 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

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**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

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**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

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**Conners 3 DSM-IV-TR Sx Scales**

ADHD Inattentive

ADHD Hyperactive-Impulsive

ADHD Combined

Conduct Disorder

Oppositional Defiant Disorder

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### Conners 3 Validity Scales

Positive impression

Negative impression

Inconsistency index

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### 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

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### 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

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## Conners 3 Versions

Self-Report (ages 8-18)

Long Version

99 items; 20-25 minutes

Short Version (CWARS:S)

41 items; 10-15 minutes

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## Conners 3 Scoring

Hand scoring and computer scoring available

Interpretation based on T-scores

M=50, SD=10

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## 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

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### 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

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### 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

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### Conners 3

#### Strengths

Strong norming population

Multi-informant

Short and long forms available

Age and gender specific norms

#### Weaknesses

Low interrater agreement

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## Brown Attention-Deficit Disorder Scales



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## Brown ADD 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

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## Brown ADD Scales

### Uses:

- Screening
- Comprehensive diagnosis
- Monitoring of treatment

Written at 6<sup>th</sup> to 9<sup>th</sup> 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+)

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## Brown ADD Scales

Clusters:

Activation: organizing, prioritizing, and activating to work

Attention: focusing, sustaining, and shifting attention to tasks

Effort: regulating alertness, sustaining effort, and processing speed

Affect: managing frustration and modulating emotions

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## Brown ADD Scales

5. Memory: utilizing working memory and accessing recall

6. Monitoring and Self-Regulating Action  
(children's edition only)

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## Brown ADD Scales

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

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## 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

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## 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

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## Behavior Rating Inventory of Executive Function (BRIEF)



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### 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

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### BRIEF

Written at 5<sup>th</sup> grade reading level  
Forms for 4 types of reporters:  
Parent  
Teacher  
Self  
Other informant

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### 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

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## 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

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## BRIEF

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

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## 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)

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## 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:

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

3 indexes:

ISCI	3. EMI
FI	

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## BRIEF

### Children's Parent and Teacher Version (BRIEF)

Ages 5-18 years

86 items; 10-15 minutes

8 scales:

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

2 indexes:

BRI	2. MI
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## BRIEF

### Self-Report (BRIEF-SR)

Ages 11-18

80 items; 10-15 minutes

8 scales:

- |                   |                              |
|-------------------|------------------------------|
| Inhibit           | 5. Working Memory            |
| Shift             | 6. Plan/Organize             |
| Emotional Control | 7. Organization of Materials |
| Monitor           | 8. Task Completion           |

– 2 indexes:

- |        |       |
|--------|-------|
| 1. BRI | 2. MI |
|--------|-------|

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## BRIEF

### Adult and Informant Versions (BRIEF-A)

Ages 18-90

75 items; 10-15 minutes

9 scales:

- |                   |                              |
|-------------------|------------------------------|
| Inhibit           | 6. Plan/Organize             |
| Shift             | 7. Organization of Materials |
| Emotional Control | 8. Task Monitor              |
| Initiate          | 9. Self-Monitor              |
| Working Memory    |                              |

2 indexes:

- |     |       |
|-----|-------|
| BRI | 2. MI |
|-----|-------|

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## BRIEF

### Scoring

Hand scoring

Computer scoring; provides:

Summary

Report

T-score interpretation

>59 = normal

60-64 = mildly elevated

65+ = significantly elevated

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## 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 1419 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

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## BRIEF

### Strengths

Norms represent US  
Contain validity scales

### Weaknesses

No emphasis on hyperactivity

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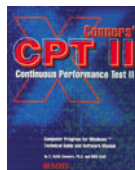
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## Conners' Continuous Performance Test II (CPT-II)



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## 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

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## 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

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## 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

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## CPT-II

Response style indicator ( $\beta$ ): 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

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## CPT-II

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

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## CPT-II

Conners' Kiddie Continuous Performance Test  
Version 5 (K-CPT V.5)

Ages 4-5

7.5 minute administration time

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## 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

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## 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

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## CPT-II

### Psychometrics

Split-half coefficients = .73-.95

Significantly sensitive to attentional deficits in those with ADHD

Good measure of true performance

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## 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

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## Test of Everyday Attention (TEA)



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## 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

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## TEA

### TEA

Ages 18-80; 45-60 minutes

3 parallel forms

8 subtests:

Map Search – search for symbols on a colored map;  
80 total with 2 minute time limit

Elevator Counting – count a series of tape-presented  
tones

Elevator Counting with Distraction – count elevator  
tones while ignoring higher tones

Visual Elevator – count up and down while following  
visually presented floors

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## TEA

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”

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## TEA

– 4 factors:

1. Visual selective attention/speed (Map Search +  
Telephone Searches)
2. Attentional Switching (Visual Elevator)
3. Sustained Attention (Lottery + Elevator Counting)
4. Auditory Working Memory (Auditory Elevator with  
Reversal + Auditory Elevator with Distraction)

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## TEA

### TEA for Children (TEA-Ch)

Ages 6-16; 60 minute administration

2 parallel forms

9 subtests:

Sky Search – rapidly and accurately circle paired “spaceship” stimuli amid a competing visual array of distracters

Score! – silently count tones presented on tape and give correct count at end of each “game”

Creature Counting – count “creatures” aligned along a path, where up arrows indicate a need to count upwards, and down arrows downwards

Sky Search DT – pair “spaceship” stimuli while simultaneously silently counting tones until visual search is complete

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## TEA

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

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## TEA

### 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)

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## 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

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## TEA

### Psychometrics:

Good test-retest reliability

Satisfactory construct validity

Good discriminatory validity

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## TEA

### Strengths

Tasks simulate daily activities

Game-like format keeps children engaged

Sensitive to changes in stimulant medication

### Weaknesses:

Few studies

Small sample sizes

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## Disruptive Behavior Rating Scale



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### 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

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### DBRS

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

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## 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)

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## 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"

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## DBRS

### Reliability

Test-retest = .65-.92 for mothers, .68-.92 for fathers, and .90-.99 for teachers

Internal consistency = .67-.95 for mothers, .72-.95 for fathers, and .54-.96 for teachers

### Validity

Acceptable criterion validity

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## 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

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