Das•Naglieri Cognitive Assessment System (CAS)

Ages
5.0 - 17.11 years

Administration Time
40 minutes for the Basic Battery (8 subtests) or 60 minutes for the Standard Battery (12 subtests)

The CAS is organized into four Scales representing the PASS theory:

Planning

Planning is a cognitive process by which the individual determines, selects, and uses a strategy or method to efficiently solve a problem. The planning process provides the means to solve problems for which no method or solution is immediately apparent. Planning is also important for impulse control as well as utilization of knowledge. The CAS Planning subtests require the application of strategies to perform the novel tasks presented.

Matching Numbers (MN) consists of four pages each consisting of eight rows of numbers with six numbers per row. Children are instructed to underline the two numbers in each row that are the same. Numbers increase in length across the four pages from one digit to seven digits with four rows for each digit length. Each item has a time limit. Children 5 to 7 years are administered Items 1 and 2, and children 8 through 17 Items 2 through 4. The subtest score is based on the combination of time and number correct (accuracy score) for each page. Accuracy scores are summed and used as a measure of the child's efficiency. This subtest has an average internal reliability of .75.

Planned Codes (PCd) contains two pages, each with a distinct set of codes and arrangement of rows and columns. A legend at the top of each page shows a correspondence of letters with codes (e.g., A, B, C, D to OX, XX, OO, XO, respectively). The page contains seven rows and eight columns of letters without codes. Children fill in the appropriate codes in empty boxes beneath each letter. On the first page, all the As appear in the first column, all the Bs in the second column, all the Cs in the third column, etc. On the second page, letters are configured in a diagonal pattern. The time and number correct (accuracy score) is combined for each page and these two scores are summed to obtain the raw score. This score is a measure of the child's efficiency. The average internal reliability is .82.

Planned Connections contains eight items. The first six items require children to connect numbers appearing in a quasi-random order on a page in sequential order. The last two items require children to connect both numbers and letters in serial order alternating between numbers and letters (for example, 1-A-2-B-3-C). The items are constructed so that children never complete a sequence by crossing one line over the other. The time needed to complete the item sequence correctly is the best measure of efficiency, so the score is the total amount of time in seconds used to complete the items. The average internal reliability is .77.
Attention

Attention is a cognitive process by which the individual selectively attends to a particular stimulus and inhibits attending to competing stimuli. Successful performance on the CAS Attention subtests requires attention to be focused, selective, sustained, and effortful. The tasks present competing demands on attention and require sustained focus over time to identify a target stimuli and avoid distractions.

Expressive Attention (EA) uses two different sets of items, depending on the age of the child, to measures selectivity and the ability to shift attention. The version for children 8 years and older is like the Stroop test. On the first page children read the color words (Blue, Yellow, Green, and Red) presented in quasi-random order. Next, they name the colors of a series of rectangles (printed in blue, yellow, green, and red). Finally, the words Blue, Yellow, Green, and Red are printed in a different color ink than the colors the words name. The child is instructed to name the color ink the word is printed in, rather than to read the word. For all subjects the last page only is used as the measure of attention. The raw score is the ratio of the accuracy (total number correct) and time. The average internal reliability of Expressive Attention is .80.

Number Detection (ND) is comprised of pages of numbers that appear in different formats. On each page children are required to find a particular stimulus (the number 1, 2, and 3 printed in an open font) on a page containing many distracters (the same numbers printed in a different font style). There are 180 stimuli with 45 targets (25% targets) on the pages. The raw score for Number Detection is the ratio of the accuracy (total number correct minus the number of false detections) and the total time for each item, summed across the items, is the raw score. The more accurate the child is at detecting the target stimuli and avoiding the distracting stimuli, the higher the score will be. The average internal reliability is .77.

Receptive Attention (RA) is a two-page paper-and-pencil subtest. For children 8 years and above two pages are given. On the first page letters that are physically the same (for example, T T but not T t) are targets, but on the second, letters that have the same name (for example, Aa not Ba) are targets. Each page contains 200 pairs of letters with 50 targets (25% targets) and the same set of distracters. The raw score is the ratio of the accuracy (total number correct minus the number of false detections) and the total time for each item. These scores are summed across the items to obtain a total raw score. The average internal reliability is .77.

Simultaneous

Simultaneous processing involves integrating separate stimuli into a single whole or group. In addition to perceiving parts into a single gestalt, simultaneous processing requires understanding logical-grammatical relationships. Simultaneous subtests in the CAS require the child to perceive objects as a group and to interrelate separate elements into a whole through examination of the stimuli during the activity or through recall.

Nonverbal Matrices (NvM) is a 33-item multiple subtest that utilizes shapes and geometric designs that are interrelated through spatial or logical organization. Children are required to decode the relationships among the parts of the item and choose the best of six options. Each progressive matrix item is scored as correct or incorrect. The raw score is the total number of items correctly answered. The average internal reliability is .89.
Verbal-Spatial Relations (VSR) is composed of 27 items that require the comprehension of logical and grammatical descriptions of spatial relationships. Children are shown items containing six drawings and a printed question at the bottom of each page. The items involve both objects and shapes that are arranged in a specific spatial manner. For example, the item "Which picture shows a circle to the left of a cross under a triangle above a square"? would include six drawings with various arrangements of geometric figures, only one of which matches the description. The examiner reads the question aloud and the child is required to select the option that matches the verbal description. Children must indicate their answer within the 30-second time limit to receive credit. The raw score is the total number of items correctly answered. The average internal reliability is .83.

Figure Memory (FM) is a 27-item subtest. Children are shown a two- or three-dimensional geometric figure for five seconds. The figure is then removed and the child is presented with a response page that contains the original design embedded in a larger, more complex geometric pattern. Children are asked to identify the original design embedded within the more complex figure. For a response to be scored correct, all lines of the design have to be indicated without any additions or omissions. The total number of correct items is the raw score. The average internal reliability is .89.

Successive

Successive processing involves working with things in a specific serial order. Perception of stimuli in sequence and the formation of sounds and movements in order are required in successive processing. The Successive subtests in the CAS require the child to either reproduce a sequence of independent stimuli or answer questions based on understanding of syntactic relationships.

Word Series (WS) requires the child repeat words in the same order as stated by the examiner. The test consists of the following nine single-syllable, high-frequency words: Book, Car, Cow, Dog, Girl, Key, Man, Shoe, Wall. There are 27 items which the examiner reads to the child. Each series ranges in length from two to nine words, presented at the rate of one word per second. Each item is scored as either correct if the child reproduces the entire word series in the order presented. The raw score is the total number of items correctly repeated. Word Series average internal reliability is .85.

Sentence Repetition (SR) requires the child repeat 20 sentences that are read to the child. Each sentence is composed of color words (for example, "The blue is yellowing"). The children are required to repeat each sentence exactly as it was presented. Color words are utilized so that the sentences contain little meaning and help reduce the influence of simultaneous processing and accent the demands of the syntax of the sentence. Each item is scored as correct if the sentence is repeated exactly as presented. The raw score is the total number of sentences correctly repeated. The average internal reliability is .84.

Speech Rate (SpR) is an 8-item subtest that requires children (ages 5-7 only) to repeat a high imagery, single-, and double-syllable word series 10 times in order. The child is timed to determine how long it takes to repeat the series correctly. Examiners begin timing when the child says the first word in the series and stop timing when the child finishes repeating the last word in
the tenth repetition. The raw score is the total time in seconds for all items. Speech Rate average internal reliability is .81.

Sentence Questions (SQ) is a 21-item subtest that uses the same type of sentences as those in Sentence Repetition. Children (ages 8-17 only) are read a sentence and then asked a question about the sentence. For example, the examiner says "The blue is yellowing" and asked the following question: "Who is yellowing?" (The answer is "The blue.") Successful completion of this task demands the comprehension of the sentence based on the serial placement of the words. Each item is scored as correct if the child successfully answers the question regarding the sentence. The raw score is the total number of questions answered correctly. The average internal reliability is .84.

Das•Naglieri Cognitive Assessment System (CAS)
Technical Qualities

Standardization

The CAS standardization sample was a representative group of 2,200 children and adolescents 5.0 through 17.11 years of age. A stratified random sampling plan was used to obtain a sample that closely matched the U.S. population. There were 68 sites and 240 examiners involved in the standardization. Norms are reported in 4-month intervals.

To develop an ability-achievement discrepancy procedure, 1,600 students included in the CAS standardization group were administered the WJ-R® Tests of Achievement.

Reliability and Validity

Extensive reliability and validity information is reported in the Interpretive Handbook that accompanies the test. Full Scale reliability is .96 with the PASS Scale reliabilities ranging from .83 to .93. Internal consistency and test-retest reliability studies were conducted. Types of validity reported include construct, concurrent, predictive, and discriminant.

Validity with special populations including persons who are mentally retarded, learning disabled, gifted, or have attention deficits or traumatic brain injuries are reported. Differences in PASS Scales performance were found for these groups, supporting the discriminant validity of the CAS.

Special attention was paid to making the CAS fair for minority groups. Validity evidence reported in the Interpretive Handbook demonstrates the test's value for assessment of diverse groups of children.

The CAS is an individualized assessment that may be used for a variety of purposes, including diagnosis, eligibility, determination of discrepancies, reevaluation, and instructional planning.

The CAS subtests were designed for ease of administration and scoring, and for appeal to students. CAS administration time is approximately 60 minutes for the Standard Battery (12 subtests) or 40 minutes for the Basic Battery (8 subtest option).