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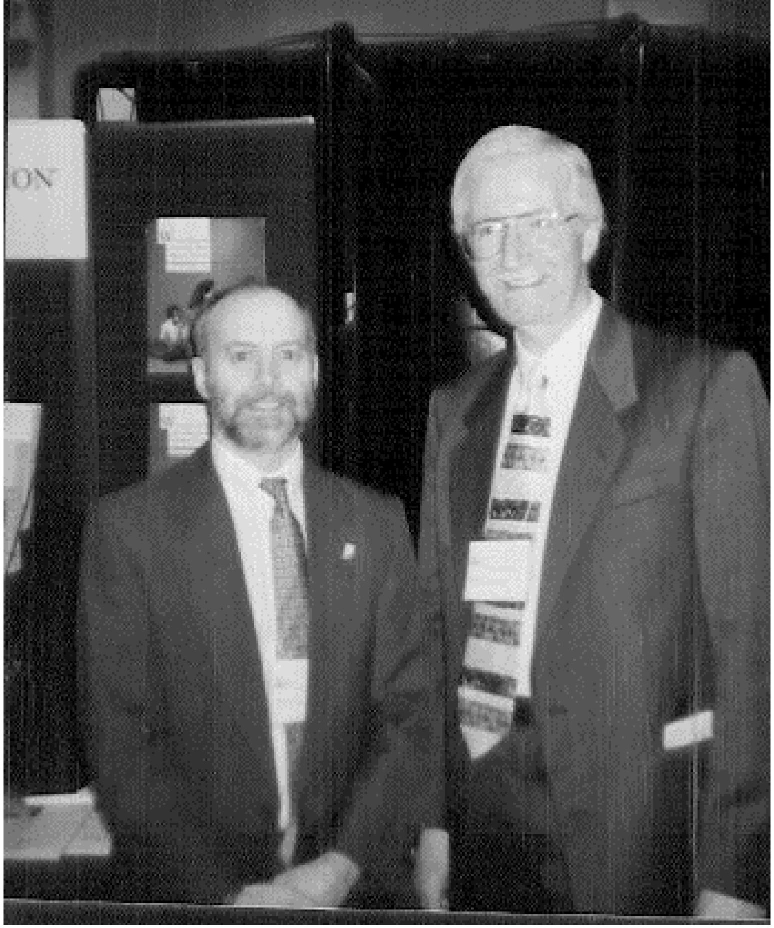
Differential Ability Scales (DAS)

DAS™

Ron Dumont - Colin Elliott



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Differential Ability Scales (DAS)

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Introduction

ne Differential Ability Scales (DAS; Elliott, 1990a) is an individually administered battery of cognitive and achievement tests for children and lolescents aged 2 years, 6 months through 17 years, 11 months. Because the DAS covers such a wide age range, it is divided into three levels: ower Preschool (ages 2 years, 6 months through 3 years, 5 months), Upper Preschool (aged 3 years, 6 months through 5 years, 11 months), and chool-Age (6 years, 0 months through 17 years, 11 months). The DAS was designed to measure specific, definable abilities and to provide terpretable profiles of strengths and weaknesses. The DAS also contains three achievement tests, co-normed with the cognitive battery, which ows direct ability-achievement discrepancy analysis. The DAS is considered suitable for use in any setting in which the cognitive abilities of children nd adolescents are to be evaluated, although many of the DAS subtests are not appropriate for students with severe sensory or motor disabilities. ne DAS cognitive battery yields a composite score labeled *General Conceptual Ability* (GCA) that is defined as "the general ability of an individual to erform complex mental processing that involves conceptualization and transformation of information" (Elliott, 1990b, p. 20).

ne DAS contains a total of 20 subtests grouped into *Core Cognitive, Diagnostic*, or *Achievement* tests. The *Core Cognitive* subtests are those used compute the GCA and cluster scores, while the *Diagnostic* subtests are those considered important and useful in the interpretation of an individual's rengths and weaknesses, but which do not assess "complex mental processing" well. The *Diagnostic* subtests provide useful information without ntaminating the GCA with subtests showing low *g* loadings. The Lower Preschool battery consists of four core subtests that combine to yield the CA and two diagnostic subtests that may be administered. The Upper Preschool battery includes six core subtests and an additional five diagnostic btests. The School-Age battery includes six core subtests and three additional diagnostic subtests. For the Upper Preschool and the School-Age tteries, the subtests not only combine to produce the GCA but also yield two or three cluster scores. For Upper Preschool children, these cluster ores represent Verbal and Nonverbal abilities. For School-Age children, the cluster scores represent Verbal, Nonverbal Reasoning [fluid reasoning eith et al., 1990)], and Spatial abilities. Although the "typical" Preschool battery is given to children aged 3 years, 6 months through 5 years, 11 onths and the "typical" School-Age battery to children 6 years, 0 months through 17 years, 11 months, the Preschool and School-Age batteries were so normed for an overlapping age range (5 years 0 months through 6 years 11 months). This overlap provides the examiner flexibility when testing ight, younger children or less able, older children. In these cases, subtests appropriate for the individual's abilities are available. Examiners may oose to give either battery or one battery and additional subtests from the other to children in the overlapping age range. Exhibit-1 describes the btests of the DAS.

khibit 1

erbal Subtests:

- *Verbal Comprehension*: following oral instructions to point to or move pictures and toys.
- *Naming Vocabulary*: naming pictures.
- *Word Definitions*: explaining the meaning of each word. Words are spoken by the evaluator.
- *Similarities:* explaining how three things or concepts go together, what they all are (e.g., house, tent, igloo; love, hate, fear)

onverbal/Spatial Subtests

- *Block Building:* imitating constructions made by the examiner with wooden blocks.
- *Picture Similarities*: multiple-choice matching of pictures on the basis of relationships, both concrete (e.g., two round things among other shapes) and abstract (e.g., map with globe from among other round things).
- *Copying:* drawing pencil copies of abstract, geometric designs.
- *Recall of Designs*: drawing pencil copies of abstract, geometric designs from memory after a 5-second view of each design.
- *Pattern Construction:* copying geometric designs with colored tiles or patterned cubes. There are time limits and bonus points for fast work. An alternative "untimed" procedure uses time limits, but no speed bonuses.

onverbal (Fluid Reasoning) Subtests

- *Matrices*: solving visual puzzles by choosing the correct picture or design to complete a logical pattern.
- *Sequential and Quantitative Reasoning*: figuring out the mathematical relationship that relates the numbers in each of two pairs of numbers and applying that rule to another number to complete the third pair.

rly Number Concepts

- *Early Number Concepts*: oral math questions with illustrations – counting, number concepts, and simple arithmetic.

chievement Subtests

- *Basic Number Skills*: paper-and-pencil math computation.
- *Spelling*: written spelling of dictated words, like a school spelling test.
- *Word Reading*: accuracy of reading increasingly difficult words aloud from a list.

agnostic Subtests

- *Matching Letter-Like Forms*: multiple-choice matching of shapes that are similar to letters.
- *Recall of Digits*: repeating increasingly long series of digits dictated at two digits per second.
- *Recognition of Pictures*: seeing one, two, or three pictures for five seconds or four pictures for ten seconds and then trying to find those pictures within a group of four to seven similar pictures.
- *Recall of Objects-Immediate*: viewing a page of 20 pictures, hearing them named by the evaluator, trying to name the pictures from memory, seeing them again, trying again to name all the pictures, and repeating the process once more. The score is the total of all the pictures recalled on each of the three trials,

including pictures recalled two or three times.

- *Recall of Objects-Delayed*: trying to recall the pictures again on a surprise retest 15 to 20 minutes later.
- *Speed of Information Processing*: the student scans rows of figures or numbers and marks the figure with the most parts or the greatest number in each row. The score is based on speed. Accuracy does not count unless it is very poor.

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Standardization

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STANDARDIZATION OF THE DAS

e DAS was standardized on 3,475 children selected to be representative of non-institutionalized, English-proficient children aged 2 years 6 months rough 17 years 11 months living in the United States during the period of data collection (spring 1987 through spring 1989). Although the DAS andardization excluded those children with severe disabilities (since for these children the DAS would be inappropriate), it did include children with ld perceptual, speech, and motor impairments, if the examiner judged that the impairments did not prevent the valid administration of the test. The emographic characteristics used to obtain a stratified sample were age, sex, race/ethnicity, parental educational level, educational preschool rollment, and geographic region. An additional 600 Black and Hispanic children were tested during standardization to enable accurate analysis of m bias, as well as to help ensure that item-scoring rules would be sensitive to minority children's responses. These additional children were not cluded in the norms calculation.

r race/ethnicity membership, individuals were classified as White (N = 2443), African American (N = 525), Hispanic (N = 382), and Other (N = 125). e four parental education categories ranged from less than 12 years of education to at least 16 years of education. The four geographic regions mpled were Northeast, North Central, South, and West. Parents in the White and Other classifications had the most education—50.8% of the White oup and 56.9% of the Other group had some college education, while 29.2% of the African American group and 19.1% of the Hispanic group had me college education. The majority of the White and African American children came from the North Central and South regions, while the majority of e Hispanic and Other children came from the South and West. The race/ethnic proportions in the sample were 70.3% White, 15.2% African merican, 11.0% Hispanic, and 3.5% Other. Demographic characteristics were compared to the March 1988 *Current Population Survey* of the U.S. ureau of the Census and were matched across as well as within categories (i.e., age x sex x race, age x sex x parent education, age x sex x region, ce x region, and age x race x parent education). Total sample percentages of these categories and subcategories were very close to the Bureau of e Census data and never different by more than 0.6 percentage points. There were variations among the 18 age groups.

the standardization sample, there were 18 age groups: 2:6-2:11, 3:0-3:5, 3:6-3:11, 4:0-4:5, 4:6-4:11, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 ars. In each six-month age group between 2years 6 months and 4 years 11months, there was a total of 175 children, while from ages 5 through 17 ere were 200 children in each one-year age group. In each six-month age group between 2 years 6 months and 4 years 11months, there were proximately equal numbers of males and females, while for all remaining age groups there were 100 males and 100 females per group. This mpling methodology was excellent. Small (under 100,000) and large (over 1,000,000) communities were slightly underrepresented.

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DAS DEVIATION COMPOSITE SCORES, T SCORES, AND TEST-AGE EQUIVALENTS

ne DAS, like many other standardized cognitive ability tests, uses the Deviation IQ (*M* = 100, *SD* = 15) for the Verbal, Nonverbal, Nonverbal easoning, Spatial, and General Conceptual Ability composite scores and T scores (*M* = 50, *SD* = 10) for the 17 individual subtests. The calculation of e DAS scores involves a 3-step process. After each subtest is scored, raw point totals are converted to Rasch-type "ability scores." These ability ores provide a raw level of performance on the individual subtest, based on the number of correct item responses and the difficulty of the items lministered. Each subtest's ability score is then converted to a T score with a range from 20 to 80. From the sums of the T scores for the subtests at create clusters, the examiner obtains the standard scores for the clusters of the test. Finally, the T scores obtained for the respective clusters are lded and this sum is used to obtain the GCA score. To convert ability scores to T scores within the examinee's own age group, use Table 1 in the *AS Administration and Scoring Manual* (Elliott, 1990; pp. 280-373). Age groups are 2-month intervals for children 2 years 6 months to 7 years, 11 onths, and 6-month intervals for children 8 years and older.

ables 2 and 3 (pp. 374 - 384) in the *DAS Administration and Scoring Manual* are used to obtain Cluster and GCA scores based on the battery-ppropriate standard subtests. If the examiner takes advantage of the opportunity to test a child older than age 5 years 11 months with the Preschool attery or a child younger than age 6 years with the School-Age battery, it is essential to use the Cluster and GCA tables that correspond to the attery actually given, not the tables for the child's age. Diagnostic subtests are never used in the calculation of GCAs nor used as replacements for re battery subtests.

est-Age Equivalents

able 11 (pp. 408-9) in the *DAS Administration and Scoring Manual* provides, for the all Cognitive and Achievement subtests, age-equivalent scores at reflect the age at which the examinee's ability score is the median score. No age-equivalent scores are available for the clusters or the General onceptual Ability Scores. These scores are provided to assist the examiner in interpreting scores on subtests that have been administered to ildren at ages for which there are no norms. Extreme caution is advised whenever using or interpreting these scores.

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RANGE OF DAS SUBTEST SCALED SCORES

e DAS provides a range of T scores from 20 to 80. However, this range is not possible for all subtests at all ages of the test. Table-18 shows the es at which a child could, on each subtest, obtain the lowest T score possible (20) and the highest T score possible (80). For the lowest T score ailable (20), none of the 17 subtests provides this scores at the lowest ages. (Verbal Comprehension, normed for ages 2 years 6 months to 6 years months, does provide a T score of 21 at age 2 years 6 months and 20 at age 2 years 9 months). At the upper end of scores, only 6 of the 17 btests provide the highest T score. For example, although the Sequential and Quantitative Reasoning subtest provides norms from ages 5 years 0 onths to 17 years 11 months, it is possible to obtain a full range of T scores (20 to 80) only between the ages of 8 years 0 months and 13 years 5 onths. A five-year-old child who is administered this subtest and fails all items, obtaining a raw score of 0, would obtain a T score of 40. Conversely, seventeen-year-old child administered this subtest and passing all items would obtain a T score of only 70.

Table-18

Age at which the DAS Subtests Provide for the Lowest and Highest T Score

Subtest	Total Normed Age Range	Usual Age Range	Age of Lowest T Score (20)	Age of Highest T Score (80)
Block Building	2:6-4:11	2:6-3:5	3:9	3:5
Verbal Comprehension	2:6-6:11	2:6-5:11	2:9	5:2
Picture Similarities	2:6-7:11	2:6-5:11	3:9	5:11
Naming Vocabulary	2:6-8:11	2:6-5:11	3:3	6:8
Early Number Concepts	2:6-7:11	3:6-5:11	4:9	5:8
Copying	3:6-7:11	3:6-5:11	4:6	7:11
Pattern Construction	3:0-17:11	3:6-17:11	4:6	14:11

Word Definitions	5:0-17:11	6:0-17:11	7:9	17:11
Similarities	5:0-17:11	6:0-17:11	7:6	17:11
Matrices	5:0-17:11	6:0-17:11	6:3	13:5
Sequential & Quantitative Reasoning	5:0-17:11	6:0-17:11	8:0	13:5
Recall of Designs	5:0-17:11	6:0-17:11	6:6	17:11
Matching Letter-like Forms	4:0-7:11	4:6-5:11	5:9	5:2
Recall of Digits	2:6-17:11	3:0-17:11	4:0	13:11
Recall of Objects	4:0-17:11	4:0-17:11	5:0	17:11
Recognition of Pictures	2:6-17:11	3:0-7:11	4:6	7:5
Speed of Information Processing	5:0-17:11	6:0-17:11	7:6	17:11

he failure to have the same maximum and minimum T scores at the upper and lower limits (i.e., a T score of 80 or 20) throughout the test may affect ow you interpret the profiles of children. On the core subtests of the Upper Preschool battery, typically administered to children aged 3 years 6 onths to 5 years 11 months, two subtests (Verbal Comprehension and Early Number Concepts) have limited ceilings, resulting in maximum T scores 71 and 75 respectively, while 3 subtests (Early Number Concepts, Copying, and Pattern Construction) have somewhat limited floor, with minimum T ores of 30, 31, and 30 respectively (see Table-19). On the core subtests of the School-Age Battery, typically administered to children between the ges of 6 years 0 months and 17 years 11 months, three subtests (Pattern Construction, Matrices, and Sequential & Quantitative Reasoning) have sufficient ceiling scores, resulting in maximum T scores of 75, 75, and 70 respectively, while 3 subtests (Word Definitions, Similarities, and equential & Quantitative Reasoning) have somewhat limited floor, with minimum T scores of 30, 30, and 32 respectively (see Table-20).

Table-19

Lowest and Highest Subtest T Score Ranges on Upper Preschool Battery

Subtest	T Score Range at Lowest Usual Age (3:6)	T Score Range at Highest Usual Age (5:11)
Verbal Comprehension	20 - 80	20 - 71
Picture Similarities	21 - 80	20 - 80
Naming Vocabulary	20 - 80	20 - 80
Early Number Concepts	30 - 80	20 -75
Copying	31 - 80	20 - 80
Pattern Construction	30 - 80	20 - 80

Table-20

Lowest and Highest Subtest T Score Ranges on School-Age Battery

Subtest	T Score Range at Lowest Usual Age (6:0)	T Score Range at Highest Usual Age (17:11)
Pattern Construction	20 - 80	20 - 75
Word Definitions	30 - 80	20 - 80
Similarities	30 - 80	20 - 80
Matrices	21 - 80	20 - 75
Sequential & Quantitative Reasoning	32 - 80	20 - 70
Recall of Designs	24 - 80	20 - 80

ANGE OF DAS FULL SCALE IQS

ne range of DAS GCA is 44 to 175. This range is not available at some ages. For example, the highest possible GCA that adolescents who are aged 7 years 11 months can get is 156; the lowest possible GCA that children who are 2 years 6 month old can get is 53.

ecause awarding T score points for no successes might be problematic, Elliott (1990. p. 53) recommends that examiners attempt to administer ubtests from a lower level of the DAS battery whenever possible. This allows examiners to administer tasks that are closer to the child's ability level. cases where this is not possible, examiners can convert the 0 raw scores to ability and then T scores and interpret the results with extreme caution. ne exception to the use of the 0 raw score is when the examiner believes that the child's performance does not accurately reflect the child's ability. In case where a child refuses to do a task or to answer questions, the raw score would reflect the child's unwillingness to participate in the testing of at ability and not reflect the child's inability to do the task. In these cases, if only one subtest was considered invalid, the examiner might prorate the omposite based on the remaining, valid scores. When more than one subtest is considered invalid, the examiner should omit the calculation of the mposite scores and restrict interpretation to the subtest level.

or children of very low ability, the DAS provides a procedure for calculation of downward extensions of the GCA. Table 5 (pp. 385-89) in the *DAS dministration and Scoring Manual* provides the norms for obtaining GCA scores as low as 25. In order to obtain extended GCA scores, the examiner dministers the appropriate subtests for a particular level of the DAS (e.g., Upper Preschool). The examiner then converts the obtained ability scores T scores using the usual subtest norm tables. However, the examiner uses the T score from an appropriate *Reference Age Group* for the level of e Cognitive Battery that was administered. The three *Reference Age Groups* available are 2 years 6 months to 2 years 8 months (Lower Preschool dministration), 3 years 6 months to 3 years 8 months (Upper Preschool administration), and 6 years 0 months to 6 years 2 months (School-Age lministration).

or example, a child of age 8 years 0 months is administered the Upper Preschool battery rather than the usual School-Age battery. The child obtains e ability scores shown in Figure 3. To calculate the T scores, the examiner uses the norm table for the *Reference Age Group* (3:6 - 3:8) (*DAS dministration and Scoring Manua*l, p. 286). Using the sum of these T scores, an Extended GCA of 35 is found in Table 5. GCA Equivalents of Sums T Scores for the Reference Age Group (p. 386 - 7).

Figure 3

Calculation of Extended GCA

Subtest	Ability Score	T Score from Reference Age Group (3:6 - 3:8)
Verbal Comprehension	91	43
Picture Similarities	60	48
Naming Vocabulary	75	50
Pattern Construction	65	48
Early Number Concepts	70	56
Copying	64	59
	Sum of T scores	304
	Extended GCA Score	35

nis procedure allow examiners to administer the Lower Preschool battery to children up to the age of 6 years 11months, and the Upper Preschool attery to children up to age 13 years 11 months and still calculate T scores and Extended GCA scores.

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Culture and Linguistic Loading

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DAS Subtests and the Degree of Cultural Content and Linguistic Demand

he subtests of the DAS have been categorized by McGrew, Flanagan, & Ortiz (1998, pp. 427-438), and further elaborated on by Flanagan, McGrew, Ortiz (2000, pp. 305-310), according to both their presumed cultural loading and degree of linguistic demand. Regarding cultural content, it was asoned that subtests that are typically less influenced by U.S. culture, contain abstract or novel stimuli, and require simple, less culturally bound mmunicative responding (e.g., pointing) might yield scores that are less affected by an individual's level of exposure to mainstream U.S. culture. ultural content was evaluated and classified as high, moderate, or low. Linguistic demands were classified according to the extent to which the aminer was required to use expressive and receptive language to administer the tasks, and the level of language proficiency needed by the aminee in order to understand and appropriately respond to the task directions. Linguistic demands were classified as high, moderate, and low. able-21 shows the DAS subtests and their levels of cultural and linguistic demand, according to the analysis by McGrew, Flanagan, & Ortiz (1998).

Table-21

DAS Subtests Cultural Loading and Linguistic Demands

	Degree of Linguistic Demands		
	Low	**Moderate**	**High**

Level of Cultural Loading	**Low**	Matrices Sequential & Quantitative Reasoning Pattern Construction Block Building Matching Letter-Like Forms Recall of Designs Copying	Recall of Digits Speed of Information Processing	
	Moderate	Picture Similarities Recognition of Pictures Recall of Objects	Early Number Concepts	
	High		Verbal Comprehension Naming Vocabulary	Similarities Word Definitions

Adapted from Kevin McGrew & Dawn Flanagan's *The Intelligence Test Desk Reference (ITDR): Gf-Gc Cross-Battery Assessment* (Allyn & Bacon, 1998) Table 14-4 and from Dawn Flanagan, Kevin McGrew, and Samuel Ortiz's *The Wechsler Intelligence Scales and Gf-Gc Theory: A Contemporary Approach to Interpretation* (Allyn & Bacon, 2000 Table 8.2.

or the 17 DAS subtests, 10 were assessed by McGrew, Flanagan, & Ortiz (1998) as having low Linguistic Demands while 9 had low Cultural emands. Only 4 subtests were deemed to be high in either Cultural or Linguistic demand and only two (Word Definitions and Similarities) were high both demands. Seven subtests were found to be low in both areas and of these, 4 (Matrices, Sequential & Quantitative Reasoning, Pattern onstruction, and Recall of Designs) make up the School-Age Special Nonverbal Composite.

he "low-low" properties of the DAS subtests have contributed to make it a very popular pre-school and bilingual assessment tool. The DAS is rather nique among cognitive assessment batteries in that it provides one of the widest ranges of coverage of the broad Gf-Gc abilities, and does so with e lowest overall culture-language demands.

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SUBTESTS

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RELIABILITY OF THE DAS

he DAS has excellent reliability. Average internal consistency reliability coefficients for the GCA, based on the 13 whole-year age groups, are .90, 4, and .95 (Lower Preschool, Upper Preschool, and School-Age respectively), .88 for the Verbal Scales (Upper Preschool and School-Age), .89 and 0 for Preschool Nonverbal ability and School-Age Nonverbal Reasoning ability, and .92 for the Spatial ability scores.

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Subtest Reliabilities

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ubtest Reliabilities

ne internal consistency reliabilities for the subtests are lower than those for the GCA and the three clusters, as would be expected. The average ernal consistency reliabilities range from a low of .70 for Picture Recognition to a high of .91 for both Pattern Construction and Speed of Information ocessing. At the Preschool level, across 9 age groups, and including subtests that at certain ages are considered "out of level," the median internal nsistency reliability was .79. For the School-Age subtests, across the 13 age groups, the median internal consistency reliability was .83.

or the Preschool batteries, the core subtests had an average mean reliability of .82 compared to the diagnostic subtests' average mean reliability of 9. Pattern Construction *(r* = .88) is the most reliable Preschool subtest. For the School-Age battery, the core subtests had an average mean liability of .84 compared to the diagnostic subtests' average mean reliability of .81. The core Pattern Construction *(r.* = .91) and diagnostic Speed of formation Processing *(r.* = .91) are the most reliable School-Aged subtests.

andard Errors of Measurement

ne average standard errors of measurement *(SE_m)* in standard score points are 3.80 for the GCA, 5.14 for the Verbal clusters, 4.85 for the Nonverbal usters, and 4.19 for the Spatial cluster. Thus you can place more confidence in scores based on the GCA than in those based on either the Verbal, onverbal, or Spatial scores. In addition, you can place more confidence in scores obtained from the Spatial cluster than in those obtained from the onverbal Clusters and the Verbal Clusters.

cross the 13 whole-age groups, the standard errors of measurement for the subtests in T score units range from 2.66 (Pattern Construction at age) to 5.44 (Recall of Objects at age 8) except for Recognition of Pictures at age 16, where it is an out-of-level subtest and has an SE_m of 8.64. [T ore units are 2/3 as large as standard score units with an SD of 15 points, so, for example, an SE_m of 2.66 T score units would be comparable to 99 standard score units.] Within the Preschool batteries, Pattern Construction has the smallest average SE_m (3.40), and Recall of Objects- nmediate has the largest average SE_m (5.33). Within the School-Age batteries, Pattern Construction has the smallest average SE_m (2.93), and ecall of Objects has the highest average SE_m (4.94) except for Recognition of Pictures, which is an out-of level subtest above age 7 years 11 onths and has the largest average SE_m (5.49).

est-Retest Reliability

the standardization sample, the stability of the DAS was assessed by having 393 individuals from four age groups (3:6-4:5, 5:0-6:3, 5:9-6:11, and :0-13:11) retested after an interval ranging from 2 to 7 weeks (M = 30 days; *DAS Introductory and Technical Handbook*, p. 184). In the four age oups, the stability coefficients corrected for restriction of range were, respectively, .90, .94, .89, and .93 for the GCA; .84, .89, .87, and .89 for the erbal Clusters; .79, .86, .80, and .83 for the Nonverbal and Nonverbal Reasoning Clusters; and .79, and .90 for the Spatial Clusters. Thus, the DAS ovides highly stable GCA and Cluster scores.

ability coefficients for the DAS subtests ranged from a low of .38 for Recall of Objects-Delayed at ages 3 years 6 months to 4years 5 months to a gh of .90 for Pattern Construction at ages 12 years 0 month to 13 years 11months.

hanges in Composite Scores

he mean test-retest scores and standard deviations for the Verbal, Nonverbal, Spatial, and GCA for the four age groups are presented in the *DAS troductory and Technical Handbook*. On average, from the first to the second testing, the GCA increased by 3.0 to 7.8 points, the Verbal cluster creased by 1.2 to 5.1 points, the Nonverbal from 3.3 to 6.6, and the Spatial from 4.7 to 7.6 points. Measures of Verbal ability were somewhat more able and showed smaller practice-effect gains than both the Nonverbal and Spatial abilities. At the composite levels, across the Preschool and chool-Age batteries, the Verbal cluster increased about 2 points at the Preschool level and about 4 points at the School-Age level. The nonverbal usters increased somewhat more (4 and 6 points respectively for the two levels), while the Spatial cluster averaged a 6.2-point increase.

udies are needed to evaluate the stability of the DAS with other samples, including preschoolers and adolescents, and over longer periods of time. uch research would be helpful in learning about how cognitive abilities on the DAS change and in interpreting changes in scores when students are -evaluated.

hen the DAS is administered a second time, within 2 to 7 weeks, children are likely to have greater gains on the Nonverbal and Spatial subtests than the Verbal subtests. Similarly to those changes noted on the Wechsler tests, this may happen because children may be able to recall the (a) types items they were administered the first time and (b) strategies they used to solve the problems. During the first administration, children may perceive e Nonverbal and Spatial subtests as more novel than the Verbal subtests. On retest, these items may become less novel and perhaps more a test of ng-term memory and ability to apply previous learning sets than a test of adaptability and flexibility.

arge retest gains on the Nonverbal and Spatial Composites raise concerns when interpreting the results when the DAS is readministered after a eriod of only 2 to 7 weeks. For periods longer than 7 weeks, gains on retest are likely to be lower because practice effects tend to diminish over time, t this assumption needs to be verified and quantified through research. A gain on the retest may have nothing to do with increased ability per se, d may simply reflect exposure to the test materials or practice effects.

arefully consider whether you want to use the DAS for repeated evaluations, especially if you plan to use the results obtained on the retest for acement, eligibility, or diagnostic decisions. If the time between testing is relatively short, strongly consider using another individually administered, ell-standardized test of cognitive ability for the reexamination.

hanges in subtest T scores

n the preschool battery, the largest changes were for Recall of Objects-Immediate (increases of 2.6 to 5.5 T-score points), whereas the smallest anges were for Copying (decrease of 1 to an increase of .6). On a short-interval readministration, Recall of Objects-Immediate becomes in essence e-Recall of Objects. Drawing copies of geometric designs, on the other hand, is a skill thoroughly practiced by many preschool children and therefore obably does not benefit much from a little additional practice.

n the School-Age battery, the largest changes were, again, for Recall of Objects-Immediate subtest (increases of 6.2 to 9.0 T score points), whereas e smallest changes were for the Recognition of Pictures and Recall of Digits subtests (averaging 1.3 and 1.7 points respectively). Recognition of ctures is an out-of-level subtest from ages 8:00 through 17:11. For the six core subtests, the average gain ranged from 1.9 points for Word efinitions to 4.9 points for Pattern Construction.

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Confidence Intervals

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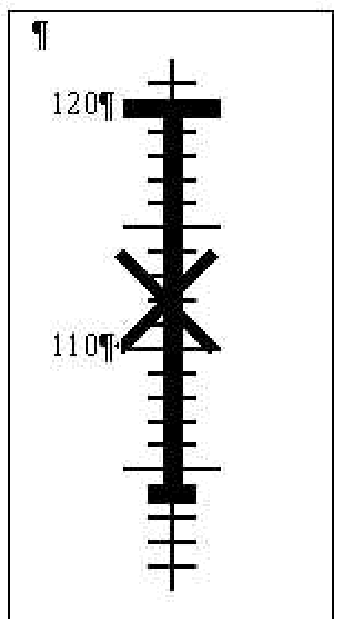
onfidence Intervals

ne DAS face sheet offers a good opportunity to record scores as confidence bands rather than as single points. The small cross bars on the vertical es under the subtests and clusters make it easy to mark off precise score ranges. For the cluster scores and GCA or Special Nonverbal Composite, e confidence band is already provided when you look up the score, so all that is needed is an X or heavy cross bar at the score, smaller cross bars the ends of the confidence interval, and a heavy, vertical line between the smaller cross bars as shown in Figure 1.

gure 1.



or individual subtests, the process requires an extra step to compute the confidence interval. When you look up the Ability Score for the student's raw ore, you find the Standard Error of Measurement (SE_m) or 68% confidence interval in parentheses to the right of the Ability Score. Multiply the SE_m 1.65 (1 2/3) for a 90% confidence interval or by 1.96 (2) for a 95% confidence band. In the example in Figure 2, a Raw Score of 4 on Item Set 4-16 elds an Ability Score of 60 with an SE_m of 6. The 90% confidence band for an SE_m of 6 is 10 [1.65 x 6 = 9.90 ≈ 10 or 1 2/3 x 6 = 6 12/3 = 10]. The % confidence band for the SE_m of 6 is 12 [1.96 x 6 = 11.76 ≈ 12 or 2 x 6 = 12.]

gure 2.

Raw Score	Item Set 1-12	1-16	**4-16**	4-21
0	10(15)	10(15)		
1	21(13)	21(13)	42(11)	42(11)
2	39(9)	33(9)	50(8)	50(8)
3	40(8)	40(8)	56(7)	55(7)
4	46(7)	46(7)	**60(6)**	60(6)
5	50(6)	50(6)	64(6)	63(6)
6	54(6)	54(6)	67(6)	66(5)
7	58(6)	57(6)	70(5)	69(5)

hen you look up the T score for the Ability Score, also look up the T score for the Ability Score minus the confidence interval and the T score for the bility Score plus the confidence interval. In our example, you would look up the T Scores for 60 and for 60 ± 10 or for 50, 60, and 70. You would ake an X at 60, draw cross bars at 50 and 70, and draw a heavy, vertical line between the cross bars. For the examiner's convenience, Table 9 ows 90% and 95% confidence intervals for SE_m values from 1 through 20.

Table 9 90% & 95% Confidence Intervals

	Confidence Intervals	
SE_m	90%	95%
1	2	2

2	3	4
3	5	6
4	7	8
5	8	10
6	10	12
7	12	14
8	13	16
9	15	18
10	17	20
11	18	22
12	20	24
13	22	26
14	23	28
15	25	30
16	27	32
17	28	34
18	30	36
19	32	38
20	33	40

"psychograph" (Wechsler's term) with 90% or 95% confidence bands encourages both examiner and reader to think of scores as intervals, not as ngle points. The confidence bands reinforce the requirements not to interpret insignificant differences between test scores and to be sure to pay tention to significant differences between scores.

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Validity

Differential Ability Scales (DAS)

DAS™

VALIDITY OF THE DAS

ne *DAS Introductory and Technical Handbook* (The Psychological Corporation, 1990) presents studies that focus on the concurrent, and construct lidity of the DAS. These studies are summarized below.

iterion Validity

ne degree to which a test is related to an established criterion measure, when both instruments are administered at approximately the same time, flects concurrent validity. The *DAS Introductory and Technical Handbook*, pp. 217-241, reports the findings of a series of studies in which the DAS as given along with the *Wechsler Preschool and Primary Scale of Intelligence-Revised* (**WPPSI-R**; Wechsler, 1989), *Wechsler Intelligence Scale for nildren-Revised* (**WISC-R**; Wechsler, 1974) *Stanford-Binet: Fourth Editio*n (**SB:FE**; Thorndike, Hagen, & Sattler, 1986), *McCarthy Scales of nildren's Abilities* (**MSCA**; McCarthy, 1972), and the *Kaufman Assessment Battery for Children* (**KABC**; Kaufman & Kaufman, 1983). Below is a mmary of some of those studies. These findings are based on relatively small samples with predominantly average ability and should not be eneralized to individuals at the relative extremes of the intelligence distribution.

eschool level of the DAS:

AS and WPPSI-R. A sample of 62 children between ages 4 years 6 months and 5 years 11 months was administered the DAS and WPPSI-R within 1- to 6-week period. The average retest interval was 14 days. The group was predominantly Caucasian (88 percent Caucasian, 8 percent African merican, 2 percent Hispanic, 2 percent other) and composed of an equal number of males and females. The correlations between the composite ores indicated that the two batteries shared much in common. The CGA and the WPPSI-R Full Scale correlated .89, while the Verbal cluster of the AS correlated with the Verbal IQ of the WPPSI-R .74 and the DAS Nonverbal cluster correlated with the WPPSI-R Performance Scale .75. All DAS re subtests correlated with the WPPSI-R Full Scale above .4 (median = .65) and ranged from a low of .45 for Picture Similarities to a high of .80 for erbal Comprehension. The correlations between the diagnostic subtests and the WPPSI-R IQ scales were generally low (below .4) with the ception of the Matching Letter-like Forms subtests (range .51 to .61). The lower correlations were expected given the low g loading of the diagnostic btests, which do not contribute to the GCA.

he DAS Verbal, Nonverbal, and GCA scores were generally lower than the WPPSI-R Verbal, Performance, and Full Scales. The average difference as 3.6 points on the Verbal Scales (97.6 vs. 101.2), .9 points on the Nonverbal vs. Performance Scales (99.0 vs. 99.9) and 2.7 points on the GCA vs. ull Scale (98.3 vs. 101.0). These differences are about what we would predict from the general rise in IQ test scores among children in the western orld (Flynn, 1998). These differences fit that expected pattern better than do the differences between the WPPSI-R and WISC-III (see Chapter XX).

sample of 23 Louisiana children between the ages of 3 years 6 months and 5 years 11 months was administered the DAS and WPPSI-R within a 56- 106-day period. The average retest interval was 74 days. The group was predominantly Caucasian (70 percent Caucasian, 30 percent African merican) and composed of approximately equal numbers of males and females. The correlations between the composite scores again indicated that e two batteries shared much in common. The CGA and the WPPSI-R Full Scale correlated .81 while the Verbal cluster of the DAS correlated with e Verbal Scale of the WPPSI-R .75 and the DAS Nonverbal cluster correlated with the WPPSI-R Performance Scale .80. All DAS core subtests rrelated with the WPPSI-R Full Scale above .4 (median = .57) and ranged from a low of .41 for Pattern Construction to a high of .64 for Naming ocabulary. The correlations between the diagnostic subtests and the WPPSI-R IQ scales were low (.22 and .36).

he DAS Verbal, Nonverbal, and GCA scores were generally lower than the WPPSI-R Verbal, Performance, and Full Scales. The average difference AS vs. WPPSI-R) was 3.6 points on the Verbal Scales (94.1 vs. 97.7), no difference on the Nonverbal vs. Performance Scales (99.0 vs. 99.0) and 4 points on the GCA vs. Full Scale (96.5 vs. 97.9).

AS and SB:FE. The DAS and SB:FE were administered in counterbalanced order to a sample of 58 children aged 4 years 0 months to 5 years 11 onths (mean = 5 years 0 months). The interval between the two test administrations ranged from 1 to 43 days (M = 9 days). The group was edominantly Caucasian (93 percent Caucasian, 7 percent African American) and composed of an approximately equal numbers of males (46%) and males (54%).

he DAS CGA and the SB:FE Composite correlated .77, while the Verbal cluster of the DAS correlated highest with the Verbal Reasoning Composite the SB:FE (r =.72). The DAS Nonverbal cluster correlated higher with the SB:FE Abstract-Visual Reasoning score (r = .64) than with any other 3:FE score other than the overall Composite score.

he SB:FE Verbal Reasoning, Abstract-Visual Reasoning, Quantitative Reasoning, Short-term Memory, and Composite scores were generally close or slightly above the DAS Verbal, Nonverbal, and GCA scores. The average difference (DAS vs. SB:FE) was 4.5 points on the Verbal vs. Verbal easoning scores (104.5 vs. 109.0), 5.2 points for the Nonverbal vs. Abstract-Visual Reasoning scores (101.9 vs. 107.1), and 2.4 points for the GCA . Composite scores (104.5 vs. 106.9). These results suggest that the two scales yield comparable overall scores.

AS and the MSCA. Forty-nine British preschool children (ages 3 years 4 months to 3 years 7 months) were administered both the DAS and the cCarthy Scales of Children's Abilities within an unspecified time frame. The children were divided into two groups: Lower Preschool (n = 49) and pper Preschool (n = 40) for analysis purposes. For the younger group (3:4-3:7), the DAS GCA correlated well with the General Cognitive Index (GCI) ore of the MSCA (r = .76). The mean difference between the overall scores was approximately 7.2 points, with the MSCA higher.

or the older group (3:6-3:7), the DAS GCA again correlated well with the General Cognitive Index (GCI) score of the MSCA (r = .82). The mean fference between the overall scores was approximately 7.7 points, with the MSCA higher. The differences between the GCA and the GCI mean ore for both groups is consistent with expectations based on the 18-year difference between the standardization of the two tests (Flynn, 1998).

AS and the K-ABC. The K-ABC was given to 23 Louisiana children of ages 3 years 6 months through 5 years 11 months (70% Caucasian, 30% rican American, 52% Female, 48% Male) 62 to 111 days (M = 74 days) before they were given the DAS. Correlations of the K-ABC with the DAS ere lower than correlations of the WPPSI-R DAS (GCA vs.MPC = .68), and the MPC was 4.9 points higher than the CGA.

chool-Age level of the DAS:

AS and WISC-R. Two samples, one composed of 66 children aged 8:0 to 10:2 administered the two tests between 1 to 63 days apart (M= 16 days) nd the other composed of 60 adolescents between 14 years 0 months and 15 years 11 months years of age administered the two tests between 5 to 2 days apart (m = 21 days), were administered the DAS and WISC-R.

or the younger group, all of the DAS composites correlated highly with the WISC-R Full Scale IQ (range .68 to .84). The DAS Verbal score correlated ghest with the WISC-R Verbal IQ (.84), while the DAS Nonverbal Reasoning score correlated higher with the WISC-R Verbal than with the erformance (.77 vs. .57). The DAS Spatial cluster correlated highest with the WISC-R Performance scale (.69).

he DAS Verbal, Nonverbal, Spatial, and GCA scores were generally lower than the WISC-R Verbal, Performance, and Full Scales. The average fference between the GCA and the Full Scale IQ was 8.1 points (107.2 vs. 115.3) and probably reflects the differences that occur because of the terval between the standardization of the two tests (Flynn, 1998).

or the older group, very similar results were found. All of the DAS composites correlated well with the WISC-R Full Scale IQ (range .59 to .91). The AS verbal score correlated highest with the WISC-R Verbal IQ (.84) while the DAS Nonverbal Reasoning score correlated almost equally well with oth the Verbal and Performance scales of the WISC-R (.68 and .69 respectively). The DAS Nonverbal Reasoning score also showed a correlation of 9 with the WISC-R "Third Factor . . . calculated by the formula provided by Sattler (1988, p. 816)" (Elliott, 1990b, p. 228). For older students, the AS Nonverbal Reasoning subtest, Sequential and Quantitative Reasoning, requires extensive mental arithmetic. The correlation between the DAS equential and Quantitative Reasoning and the WISC-R Arithmetic subtests was .81. Subtests involving mental arithmetic make up one-third of the ISC-R "Third Factor" and one-half of the DAS Nonverbal Reasoning cluster. The DAS Spatial cluster correlated highest with the WISC-R erformance scale (.77).

gain, the DAS Verbal, Nonverbal, Spatial, and GCA scores were generally lower than the WISC-R Verbal, Performance, and Full Scales. The verage difference between the GCA and the Full Scale IQ was 5.7 points (100.5 vs. 106.2) and again probably reflects the differences that occur ecause of the interval between the standardization of the two tests (Flynn, 1998).

AS and WISC-III. The WISC-III manual (Wechsler, 1991) presents a sample of 27 children aged 7 to 14 administered the two tests.

or the group, all of the DAS composites correlated highly with the WISC-III Full Scale IQ (range .71 to .92). There was a high (.92) correlation etween the DAS GCA and the WISC-III Full Scale IQ. The DAS Verbal score correlated highest with the WISC-III Verbal IQ (.87) while the DAS onverbal Reasoning score correlated higher with the WISC-III Performance than with the Verbal (.78 vs. .58). The DAS Spatial cluster correlated ghest with the WISC-III Performance scale (.82).

he DAS Verbal, Nonverbal, Spatial, and GCA scores were slightly lower than the WISC-III Verbal, Performance, and Full Scales. The average fference between the GCA and the Full Scale IQ was 2.1 points (103.4 vs. 105.5) and may reflect the differences in the constructs measured by the o tests.

umont, Cruse, Price, & Whelley (1996) examined the relationship between the DAS and WISC-III for a sample of 53 children identified as having a arning disability. Each of the children had been administered the WISC-III and approximately 3 years later, was administered the DAS.

or this group, all of the DAS composites correlated moderately with the WISC-III Full Scale IQ (range .64 to .78). There was a high (.78) correlation etween the DAS GCA and the WISC-III Full Scale IQ. The DAS Verbal score correlated highest with the WISC-III Verbal IQ (.77), while the DAS onverbal Reasoning score correlated higher with the WISC-III Performance than with the Verbal (.55 vs. .65). The DAS Spatial cluster correlated ghest with the WISC-III Performance scale (.67).

he DAS Verbal, Nonverbal, Spatial, and GCA scores were slightly lower than the WISC-III Verbal, Performance, and Full Scales. The average fference between the GCA and the Full Scale IQ was 2.4 points (87.2 vs. 89.7) and may reflect the differences in the constructs measured by the o tests.

AS and SB:FE. The DAS and SB:FE were administered in counterbalanced order to a sample of 55 children aged 9 years 0 months to 10 years 11 onths (mean = 9 years 11 months). The interval between the two test administrations ranged from 1 to 62 days (M = 11 days). The group was edominantly Caucasian (i.e., 85 percent Caucasian, 11 percent African American, and 4 percent Hispanic) and composed of an approximately equal umbers of males (55%) and females (45%).

he DAS CGA and the SB:FE Composite correlated .88, while the Verbal cluster of the DAS correlated highest with the Verbal Reasoning Composite the SB:FE (r =.79). The DAS Nonverbal Reasoning cluster showed a strong relationship with both the SB:FE Abstract-Visual Reasoning (r = .76) nd the Quantitative Reasoning (.75), while the DAS Spatial correlated best with the SB:FE Abstract Visual Reasoning (.67).

he SB:FE Verbal Reasoning, Abstract-Visual Reasoning, Quantitative Reasoning, Short-term Memory, and Composite scores were generally close or slightly above the DAS Verbal, Nonverbal, and GCA scores. The average difference (DAS vs. SB:FE) was 5.8 points on the Verbal vs. Verbal easoning scores (103.8 vs. 109.6), 3.1 points for the Nonverbal Reasoning vs. Abstract-Visual Reasoning scores (104.8 vs. 107.9), 2.1 points for the onverbal Reasoning vs. Quantitative Reasoning scores (104.8 vs. 106.9), 5.1 points for the Spatial vs. Abstract-Visual Reasoning scores (102.8 vs. 07.9), and 3.5 points for the GCA vs. Composite scores (106.3 vs. 109.8). These results suggest that the two scales yield comparable overall scores.

AS and WJ-R. Dumont, Willis, Farr, McCarthy, & Price (2000) administered the DAS and WJ-R to 81 children (47 males, 34 females; 78 Caucasian, African American; ages 6 years 6 months to 17 years 8 months) referred for special education services evaluation. The WJ-R BCA-STD correlated 5 with the DAS GCA, .64 with the DAS Verbal, .50 with the DAS Nonverbal Reasoning, and .51 with the DAS Spatial clusters. Mean differences AS vs. WJ-R BCA-STD) were -2.80 (GCA), -0.74 (Verbal), -6.07 (Nonverbal Reasoning), and 0.84 (Spatial). Dumont et al. (2000, p. 36) aracterized the correlation between the CGA and BCA-STD as significant, but only moderate. Some, but not all of the correlations between DAS nd WJ-R subtests conformed to predictions based on broad and narrow ability classifications from the McGrew, Flanagan, and Ortiz Integrated arroll/Cattell-Horn Gf-Gc theory (McGrew & Flanagan, 1998). Dumont et al. caution against the assumption that subtests purporting to measure the ame broad and narrow abilities will actually yield comparable scores for any individual.

ased upon the correlations across the different measures, it appears that the DAS has satisfactory concurrent validity. For the most part, the DAS CA correlates more highly with other measures of intelligence (M r = .83) than it does with tests of academic achievement (M r = .58.)

onstruct Validity

he method of assessing construct validity is factor analysis. Factor analysis can be used to determine the structure and components of intelligence measured by a given test. The pattern of intercorrelations discussed below provides evidence of convergent and discriminant validity, which are rms of construct validity. Convergent validity is demonstrated when tasks that theoretically tap similar functions correlate more highly with each other an with tasks that theoretically measure different functions. Discriminant validity is demonstrated when tasks that purport to measure different nctions yield relatively low or nonsignificant correlations when they are correlated with each other.

here is strong evidence that the DAS yields both a measure of general intelligence and specific factors as noted in studies reported in the DAS anual.

Intercorrelations

Differential Ability Scales (DAS)

DAS ™

INTERCORRELATIONS AMONG SUBTESTS AND SCALES

ne intercorrelations between DAS subtests and scales (see Tables 9.1-9.3, pp. 198-200, *DAS Introductory and Technical Handbook*) indicate that, in e total group, correlations among the 20 subtests (including the three achievement subtests but excluding the Pattern Construction-alternative ethod) range from a low of .07 (Picture Similarities and Recall of Objects-Delayed) to a high of .68 (Recall of Objects-Immediate and Recall of ojects-Delayed). Among the twelve subtests that compose the core battery at the 3 levels, the highest intercorrelations are between verbal subtests: ower Preschool and Upper Preschool Verbal Comprehension and Naming Vocabulary (.61 and .64 respectively) and School-Age Word Definitions d Similarities (.64). The lowest subtest intercorrelations are between Lower Preschool Block Building and Picture Similarities (.28); Upper Preschool aming Vocabulary and Pattern Construction (.28); and School-Age Word Definitions and Similarities with Recall of Designs (both .38).

the School-Age group, each of the two subtests that make up a cluster correlated higher with each other than they did with any of the other subtests om other clusters. The Verbal Cluster subtests correlate more highly with each other (r = .64) than they do with either the Nonverbal Reasoning btests (M r = .48) or the Spatial subtests (M r = .40). The Nonverbal Cluster subtests correlated higher (.58) with themselves than with the Verbal uster subtests (M r = .48) or the Spatial Cluster subtests (M r = .49). Additionally, the Verbal Cluster has more in common with the Nonverbal easoning Cluster, and the Nonverbal Reasoning Cluster has more in common with the Spatial Cluster than do the Verbal and Spatial Clusters with ach other. The implication of this interaction will be discussed later in the chapter, but it does support the hypothesized integrative function required the Nonverbal Reasoning (fluid intelligence) subtests.

verage correlations between all subtests and the GCA range from .18 to .81. As expected, those subtests that, because of high g loading, are used create the GCA correlate better with the GCA than did the lower g-loaded (diagnostic) subtests.

verage correlations between the 17 individual subtests (excluding achievement subtests) and the GCA range from .22 to .82. On the Preschool attery, Early Number Concepts has the highest correlation with the GCA (.82), followed by Verbal Comprehension (.79), Similarities (.71), Pattern onstruction (.67), Picture Similarities and Copying (.65), Block Building (.58), Matching Letter-Like Forms (.51), Recognition of Pictures (.47), Recall Digits (.44), and Recall of Objects (.22). On the School-Age battery, Sequential and Quantitative Reasoning has the highest correlation with the CA (.79), followed by Matrices (.76), Similarities (.75), Word Definitions (.74), Recall of Designs and Pattern Construction (.71), Recall of Digits (.33), ecall of Objects (.31), and Speed of Information Processing (.25). Overall, the average correlation between the core subtests and the GCA is .74, mpared to the average of .39 for the diagnostic subtests. These findings support the use of the DAS as a measure of general mental ability.

though the subtests vary in their correlations with the GCA, and in their respective reliabilities, the estimation of general intellectual functioning as easured by the GCA appears justified.

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Factor Analysis

Differential Ability Scales (DAS)

DAS ™

FACTOR ANALYSIS OF THE DAS

actor Analysis reported in the *DAS Introductory and Technical Handbook* reports a series of both confirmatory and exploratory factor analyses of the andardization sample. The results indicated that, for the most part, the structure of abilities assessed by the DAS becomes more distinct as the ild's age increases. One factor provided the best fit for the core subtests for the youngest children, two factors emerges as the child's cognitive pilities increase, and a final, three-factor model is the best fit for the abilities of the school-age child. In addition to the factors created from the robust saturated subtests, the lower g-loaded diagnostic subtests provide additional information about a child's ability, independent of the core subtests.

urther support for the factors of the DAS was provided by both independent analysis of the DAS standardization sample (Keith 1990; Stone, 1992) id analysis of a separate, smaller sample of children (Byrd & Buckhalt, 1991). Keith (1990) found that there was strong support for concluding that e constructs measured by the DAS are "remarkably consistent across the overlapping age levels of the test" (p. 403). Although he chose to label the AS Spatial factor "Nonverbal Reasoning" and the Nonverbal Reasoning factor "Gf," Keith accepts that the DAS Verbal, Nonverbal Reasoning, and patial factors are good measures of Gc, Gf, and Gv respectively. Stone (1992) found support for the three-factor structure of the core subtests for hool-age children: Verbal, Nonverbal Reasoning, and Spatial Abilities.

sing a multitrait-multimethod analysis of construct validity, Byrd and Buckhalt found support for the overall general conceptual ability (GCA) and the ecificity of selected subtests for profile analysis. Although several researchers have questioned how well the names of the DAS clusters describe e constructs they measure, it is generally assumed that the DAS Nonverbal Reasoning may be considered a strong measure of Fluid intelligence f) (Keith, 1990, Elliott, 1990). This assumption has both empirical (Keith 1990, 1997; McGhee, 1993) and theoretical (McGrew, 1997; McGrew & anagan, 1998) support. Using the The McGrew, Flanagan, and Ortiz Integrated Carroll/Cattell-Horn model of abilities, the DAS Verbal cluster most ely represents Crystallized Intelligence (Gc) while the Spatial Cluster reflects primarily Visual Processing (Gv) (McGrew & Flanagan, 1998, ch. 4, ppendix A).

Measures of g

Differential Ability Scales (DAS)

DAS Subtests as Measure of g

xamination of the loadings on the first unrotated factor—in either a principal components analysis or a factor analysis—allows one to determine the tent to which the DAS subtests measure general intelligence, or g.

he seventeen DAS subtests had g loadings ranging from a low of .27 (Recall of Objects) to a high of .80 (Verbal Comprehension). Across all ages, e subtests form two clusters with respect to the measurement of g: (a) Core subtests at each level are good or fair measures of g, averaging .68 ange .53 to .82), and (b) Diagnostic subtests are poor measures of g, averaging .40 across the three levels (range .28 to .55). Only Matching Letter-ke Forms differed from this pattern, being a diagnostic subtest with fair g loadings across the ages. Overall, the g loading pattern is a reflection of the ecisions made during test development to allow only those subtests that yielded high g loading to contribute to the core while allowing those subtests th lower g loading to be considered diagnostic.

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Specificity

Differential Ability Scales (DAS)

DAS ™

Subtest Specificity

ubtest specificity refers to the proportion of a subtest's variance that is both reliable (that is, not due to errors of measurement) and distinct to the btest. Although individual subtests on the DAS overlap in their measurement properties (that is, the majority of the reliable variance for most btests is common factor variance), all possess sufficient specificity to justify the interpretation of a specific subtest functions. [On any instrument, btests with inadequate specificity should not be interpreted as measuring specific functions.] These DAS subtests, however, can be interpreted as) good or (b) fair measures of g. McGrew and Murphy (1995) consider a test's specificity to be high if it is (a) .25 or more, and (b) it is greater than e proportion of error variance. All specificity values for the DAS subtests exceed .25, the lowest being .30 (Similarities) and the highest being .82 peed of Information Processing). In every case, all subtest specificities substantially exceed the proportion of error variance.

liott (1997) examined and compared the DAS subtest specificities with those found on a number of other popular cognitive test batteries (WPPSI-R, ISC-III, WISC-R, K-ABC, SB:FE, and the WJ-R COG). He found that, when compared to these other measures, the DAS had approximately one rd more reliable subtest specificity than the other batteries. While other tests had approximately 35 to 37 percent of specific variance, the DAS eraged 47 percent for the Preschool battery and 50 percent for the School-age battery. As he notes "These results show the DAS to have about one rd greater specificity than other batteries, and strongly suggests that the original development goal of a battery with reliable, specific, individually erpretable subtests has been achieved" (p. 195).

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Range of Scores

DAS SUBTESTS

he following description of the DAS subtests includes qualitative characteristics for g loadings, reliability, and specificity. The following definitions and iteria were used in assessing each subtest. Additional information is available elsewhere in this volume and in four valuable sources: Carroll (1993), liott (1997), Flanagan, Genshaft, & Harrison (1997), and McGrew & Flanagan (1998, pp. 14-25, 64-68, 71, 63-91, 92-128).

hen describing the norms for each subtest, the terms *usual* and *extended* means that the subtest is appropriate for the full range of ability at that ge. The term *Out of level* denotes ages at which the subtest is appropriate for most, but not all children.

he *g* Loading refers to the subtest's loading on the first unrotated factor or component in principle factor analysis. A subtest with a general factor ading of .70 or greater was considered Good; a loading of .51 to .69 Fair; and a loading of .50 or lower Poor. These are the same criteria used in *he intelligence test desk reference (ITDR): Gf-Gc cross-battery assessment* (Kaufman, 1979, pp. 109-110; McGrew & Flanagan, 1998, pp. 64, 72). stimates of g loadings were taken from Tables 9.4 (p. 202), 9.7 (p. 204), and 9.11 (p. 206) of the *DAS Introductory and Technical Handbook.*

eliability refers to the degree to which a test score is free from errors of measurement. A subtest's reliability was considered High if it was greater an or equal to .90, Medium if it was greater than .79 but less than .90, and Low if it was below .80. (McGrew & Flanagan, 1998, p. 64). Subtest liabilities were found in the *DAS Introductory and Technical Handbook* Tables 8.1 and 8.2 (pp. 178-179).

subtest has three types of variance: common variance (that which is shared with other subtests in the battery); specific variance (that portion of the btest's variance that is reliable and unique to that subtest); and error variance (equal to 1 minus the reliability coefficient). We cannot interpret an bility supposedly measured by an individual subtest, unless that subtest contains a reasonable amount of reliable specific variance (specificity) and s specificity exceeds the error variance. We computed the specificity for each subtest at each age by the following procedure. The shared or mmon variance was first estimated by the squared multiple correlation between the specified subtest and all other subtests in the battery. ubtracting the reliability coefficient from the common or shared variance provided the estimate of specific variance for each subtest. Specificity was nsidered Ample if the value was equal to or above 25% of the total test variance and it exceeded the error variance, Adequate if it met only one of e two criteria noted for Ample, and Inadequate if it did not meet either of the two criteria noted for Ample. Again we followed the criteria listed in cGrew & Flanagan (1998, pp. 64-66).

he McGrew, Flanagan, and Ortiz Integrated Carroll/Cattell-Horn Gf-Gc Cross-Battery Approach Gf-Gc classifications are those proposed by McGrew Flanagan (1998). See also Carroll (1993); Flanagan, Genshaft, & Harrison (1997); Flanagan, McGrew, & Ortiz (2000); McGrew (1997); and oodcock (1990).

CORE SUBTESTS

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension

Picture Similarities Early Number Concepts Naming Vocabulary Copying

DIAGNOSTIC SUBTESTS

Recall of Objects Recall of Digits Recognition of Pictures

Speed of Information Processing Matching Letter-Like Forms

ACHIEVEMENT TESTS

Basic Number Skills Spelling Word Reading

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Word Definitions

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 17:11; Out- of-level age range is 5:0 to 5:11).

his subtest assesses acquired verbal knowledge and language comprehension and fluency.

he Word Definitions subtest contains a total of 42 words. A word is presented orally and the child is asked to define it. The child must give the eaning of the word rather than merely using it in a sentence correctly, unless the sentence would make clear the meaning of the target word, even if e word were removed. Responses are scored 1 or 0. Three different starting points are available (age 5:0 to 7:11 start at item 1; 8:0 to 10:11 start at m 4; 11:0 to 17:11 start at item 12).

actor analytic findings

ord Definitions is considered a fair measure of g across all ages (overall r = .68). This subtest contributes substantially to the Verbal factor (loading = 9). Specificity is ample for all age groups.

eliability and correlational highlights

ord Definitions is considered to possess medium overall reliability (r = .83), with reliability coefficients ranging from .75 to .84 across all of the 13 hole-age groups It correlates best with Similarities (r =.64) and least with Recall of Objects - Delayed (r = .13). It has a moderate correlation with the CA (*r* = .74).

-Gc classification

the Broad stratum definition of abilities, Word Definitions is considered to be a strong measure of Crystallized Intelligence (Gc). In the Narrow ratum of abilities, it is considered to be a probable measure of both Lexical Knowledge (VL) and Language Development (LD) (McGrew & Flanagan, 98, p. 120).

dministrative and interpretive considerations

he Word Definitions subtest is described on pages 194 to 206 in the *DAS Administration and Scoring Manual* (Elliott, 1990a) and discussed on pages to 50 and 57 in the *DAS Introductory and Technical Handbook* (Elliott, 1990b). To aid examiners in the scoring of the subtest, examples of correct d incorrect responses are included in the same section of the Manual as the directions. These examples have been listed in alphabetical order to rther aid the examiner in finding and scoring items. The DAS Word Definitions administration and scoring rules are notably different from most oral cabulary tests and, we believe, better. Examiners familiar with other intelligence tests need to review these differences carefully. If a child has fficulty understanding the oral presentation of the target word, the examiner should repeat the word, spell the word, or write it out on paper. This ocedure differs from those of the Wechsler scales. The SB: FE provides printed copies of Vocabulary words. Incorrect responses likely to be caused mishearing are marked with asterisks in the Manual. Since several words may be considered nouns or verbs, for these words examiners are utioned to be careful not to use the "What is a . . ." prompt. Otherwise, "to avoid a stilted presentation" (Elliott, 1990a) examiners are encouraged to esent the word in any of four ways, including saying the word in isolation after the first few items. Questioning of vague or incomplete responses is quired for a broader range of answers than on the Wechsler Scales. Again, examiners must be alert to this difference in administration. Examples ven in the Manual are not exhaustive. Examiners should score as correct definitions that convey "Key Concepts" and definitions that are correct cording to standard English dictionaries.

ord Definitions is a measure of both Language Development and Lexical Knowledge (McGrew & Flanagan, 1998, p. 120). On most items a child ust verbally express him- or herself adequately in order to achieve passing scores. However, there are a number of items on which the child's emonstration of the word’s meaning is enough to obtain points. Typically, what must be demonstrated, either orally or through demonstration, is an nderstanding of "Key Concepts." Examiners are cautioned not to score an item as correct simply because the examiner "knows the child knows the nswer." It is the child’s responsibility to communicate the concepts clearly to the examiner. If the child fails either of the first two items administered, e examiner must following the teaching instructions given with those items in the Manual. The examiner acknowledges correct responses to those o items.

he word, WICKED (item number 4, unfortunately the starting item for ages 8:0 through 10:11) has proven to be problematic for some children taking e test and for the examiner having to score the item. The word seems to have developed a colloquial or current-use definition that differs from the rrect responses listed in the *DAS Administration and Scoring Manual.* A number of examiners have noted that some children, instead of defining the ord as "bad" or "evil," responded with "good" or "awesome." This is not offered as an acceptable response in the DAS Manual. The children, when ked to elaborate the meaning, demonstrated that they were evidently associating the word with a new, current meaning, as in the sentence, "The nja Turtles are wicked good fighters." It appears that children are defining the word with another salient meaning. However, "good" is not an curate synonym for the colloquial meaning of "wicked," merely an association. In the phrase "wicked good fighter" and similar expressions, "wicked" tually means "very." In such cases, examiners may wish to ask for a second meaning for the word ["Yes, but what *else* does . . . mean? (Terman & errill, 1960, p. 236)]. However, if the media and society have popularized this particular word definition, it probably should be given correct credit for s subtest, if is accurately defined as "very" or a similar intensifier, perhaps even "awesome," as in "awesome good fighter." (To download a table at will allow you to score Word Definitions without the word WICKED included, press this link.)

hildren who do poorly on this subtest may be demonstrating inadequate verbal language development. Some children have difficulty adequately pressing their knowledge verbally using "much expression." If a difficulty is suspected in expressive language, a subtest like Naming Vocabulary, hich is far less open-ended and which typically requires less verbalization (one word), should be administered. Some children have specific difficulty trieving or "finding" known words. To sort out the issues of expressive and receptive vocabulary and word-finding difficulty when a student does oorly on Word Definitions, it may be prudent to use the Expressive Vocabulary Test (EVT; Williams, 1997) and the Peabody Picture Vocabulary Test, d ed. (PPVT-III; Dunn & Dunn, 1997), which have the considerable virtue of contrasting the tasks of naming pictures and choosing named pictures, oth normed on the same sample of children and adults.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Similarities

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 17:11; Out of level age range is 5:0 to 5:11).

his subtest assesses acquired verbal knowledge and language comprehension and fluency as well as verbal inductive reasoning; vocabulary and rbal development; logical and abstract thinking; and ability to distinguish between essential and superficial features.

he Similarities subtest contains a total of 34 three-word items. Children are read three words and asked to tell how they go together, what they all e, or how they are similar. Responses are typically scored 1, or 0, although 6 items do provide the option for a 2-point response as well. Three fferent starting points are available (age 5:0 to 6:11 start at item 1; 7:0 to 8:11 start at item 8; 9:0 to 17:11 start at item 13).

actor analytic findings

he Similarities subtest is considered a fair measure of g across all ages (overall r = .69). For ages 6:0 to 12:11, the g loading is considered fair, while the remaining upper ages (13:0 to 17:11) the g loading is considered good. This subtest contributes substantially to the Verbal factor (loading = 1). Specificity is ample for all age groups 6:0 to 15:11 and adequate for 16:0 to 17:11.

eliability and correlational highlights

milarities is considered to possess low overall reliability (r = .79), with reliability coefficients ranging from .73 to .84 across all of the 13 whole-age oups. There may be a certain amount of chance involved in trying to think of a correct link among the words instead of a no-credit, trivial, but also ue connection. Similarities correlates best with Word Definitions (r =.64) and least with Recall of Objects - Delayed (r = .15). It has a moderate rrelation with the GCA *(r* = .75).

-Gc classification

the Broad stratum definition of abilities, Similarities is considered to be a strong measure of Crystallized Intelligence (Gc). In the Narrow stratum of bilities, it is considered to be a probable measure of Language Development (LD) and a possible measure of Lexical Knowledge (VL) (McGrew & anagan, 1998, p. 124).

dministrative and interpretive considerations

he Similarities subtest is described on pages 228 to 240 in the *DAS Administration and Scoring Manual* and discussed on pages 60 and 61 in the *AS Introductory and Technical Handbook.* To aid examiners in the scoring of the subtest, correct and incorrect responses are included in the same ction of the Manual as the directions. The examples given have been listed in alphabetical order to further aid the examiner in finding and scoring ms. If a child has difficulty understanding the oral presentation of the target words or requests that the words be repeated, the examiner may repeat e words only once.

milarities differs dramatically in a number of ways from the subtest with the same name on the Wechsler scales. The DAS provides three target ords. This allows a child who may not know the meaning of one of the three to use the other two to develop a response. (How often has a child who d not understand the meaning for the word TRIBE received a 0 score on that WISC-III Similarities item?) The SB: FE Verbal Relations subtest asks e student to explain how three words are alike and different from a fourth. The DAS also differs from the Wechsler scales in that a child must spond with a superordinate class for the stimulus words in order to earn credit. On the Wechsler Scales, a subordinate response is given 1 point hile the superordinate response is given 2 points, after the first five items. Hypothetically two children can obtain the exact raw score of 13 (and thus e same scaled score), one giving 13 one-point subordinate responses while the other simply gives 4 two-point superordinate responses after the first e items.

gain, the DAS calls for liberal questioning of responses. "Question a response that is incorrect but that indicates some understanding. . . . On 2-point ms, also question all 1-point responses" (Elliott, 1990a, p. 229).

he Sample and the first two actual items administered are teaching items if the child gives an incorrect response. The examiner acknowledges rrect responses to those items. The examiner may use any of four means of presenting items, including simply saying the three stimulus words nce the child understands the task.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Block Building

ormed for ages 2:6 to 4:11 (Usual age range is 2:6 to 3:5; Extended age range is 3:6 to 4:11).

n this subtest the child copies a two- or three-dimensional design using wooden blocks. Block Building is a measure of motor skill and visual rceptual encoding. It requires the child to have developed the notion of copying models. Although it is a non-verbal subtest, it may be influenced by rbal encoding strategies. It reflects aspects of problem solving ability; visual perceptual matching; hand-eye coordination; spatial orientation; visual otor skills; and ability with verbal and visual cues. "Block Building was created to measure the same abilities measured by the Copying subtest for ung children not yet able to manipulate a pencil" (Elliott, 1990b, p. 43).

here are 12 items on this subtest. All children start with item 1. For the first item (building a tower with 8 blocks) the child's response is scored as 2, or 0 depending on the number of blocks used in the building. For the remaining items, the child is presented with either a two- or three-dimensional odel from which to copy the design. The last 5 of the 12 items are presented as flat (two-dimensional) designs that are more challenging because ey emphasize orientation and sequence.

actor analytic findings

he Block Building subtest is considered a fair measure of g across all ages (overall r = .51). Specificity is ample for the age groups.

eliability and correlational highlights

ock Building is considered to possess low overall reliability (r = .77), with reliability coefficients ranging from .68 to .84 across all of the five age oups. It correlates best with Copying (r =.51) and least with Recall of Objects (r = .14). It has a moderate correlation with the GCA (*r* = .65).

-Gc classification

the Broad stratum definition of abilities, Block Building is considered to be a logical measure of Visual Processing (Gv). In the Narrow stratum of ilities, it is considered to be a probable measure of Visualization (VZ) (McGrew & Flanagan, 1998, p. 96).

dministrative and interpretive considerations

he Block Building subtest is described on pages 67 to 71 in the *DAS Administration and Scoring Manual* and discussed on pages 43 and 44 in the *AS Introductory and Technical Handbook.*

xaminers should study each design and practice building each before actually administering this subtest to a child. Fumbling will damage rapport, k losing the child's attention, and penalize the child by giving an ambiguous demonstration to imitate. The Preschool record form shows each design d its correct orientation to the child.

ccording to the directions in the *DAS Administration and Scoring Manual,* rotations effect the scoring only on items 2 through 12. The examiner rrects all rotations.

econd attempts at building the designs are not allowed if the error is caused by a rotation. However, there are two situations in which the child should e given a second attempt. First, if on item number 1, the child builds the tower by placing the blocks on end (small side down) and fails to complete e tower, the examiner should demonstrate the correct way to build the tower and allow a second attempt. Score the better of the two attempts. econd, on items 1 through 7, the structure must remain free standing for at least 3 seconds (unless the child accidentally or playfully knocks down a able structure). If the structure topples before 3 seconds, the examiner should allow the child a second attempt.

Recall of Designs

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 17:11; Out of level age range is 5:0 to 5:11).

is subtest assesses the ability to encode and retain visual-spatial information and then use adequate levels of motor skills to reproduce the design; ort-term visual recall; spatial orientation; and drawing skills. The child reproduces pictured designs that have been exposed to view for only 5 conds and then removed.

e Recall of Designs subtest contains a total of 21 items. Sixteen items are scored 2, 1, or 0 while the last five items are scored as 3, 2, 1, or 0. ree different starting points are available (age 5:0 to 7:11 start at item 1; 8:0 to 11:11 start at item 4; 12:0 to 17:11 start at item 9).

actor analytic findings

e Recall of Designs subtest is considered a fair measure of g across all ages (overall r = .63). This subtest contributes substantially to the Spatial ctor (loading = .69). Specificity is ample for all age groups 6:0 to 17:11.

eliability and correlational highlights

ecall of Designs is considered to possess medium overall reliability (r = .84), with reliability coefficients ranging from .79 to .89 across all of the 13 hole-age groups It correlates best with Pattern Construction (r =.57) and least with Speed of Information Processing (r = .16). It has a moderate rrelation with the GCA *(r* = .71). Despite the obvious memory demand, Recall of Designs has relatively low correlations with other DAS subtests quiring memory: r = .35 with Recognition of Pictures, r = .25 with Recall of Objects-Immediate and .22 with Recall of Objects-Delayed, r = .19 with ecall of Digits.

f-Gc classification

the Broad stratum definition of abilities, Recall of Designs is considered to be a strong measure of Visual Processing (Gv). In the Narrow stratum of ilities, it is considered to be a probable measure of Visual Memory (MV) (McGrew & Flanagan, 1998, p. 118).

dministrative and interpretive considerations

e Recall of Designs subtest is described on pages 147 to 193 in the *DAS Administration and Scoring Manual* and discussed on pages 55 and 56 in e *DAS Introductory and Technical Handbook.* The child draws the designs on paper provided that has been cut into sheets approximately 4 inches gh by 5 inches wide. These authors have found that having available a stapler or a paperclip can be very useful and prevents the problem of losing the loose sheets of paper. It has also been suggested that examiners simply fold an 8- by 11-inch paper into quarters and allow the child to draw on e folded page. For each subsequent design, simply turn the page over to a new folded section. At the end of the subtest, you will have all the esigns drawn in separate sections of the paper.

econd attempts at drawing the designs are allowable if the child is dissatisfied with the initial drawing. The examiner should not cue the child to this ossibility. A number of children will naturally trace the designs in the air while the design is in view. This is permissible so long as the child does not tempt to draw the figure on the paper. Erasing is permitted.

though a child is allowed to rotate the paper to any position he or she wishes, the scoring of the final design is dependent on correct orientation. The anual recommends writing the item number consistently in the same corner of each sheet. The examiner should, of course, also do this in each uadrant of a folded sheet of paper if folded sheets are used. Examiners should also get into the habit of placing an arrow or some other mark on the aper, if the child rotates the sheet, so as to be able to correctly score each item later. Although scoring is not difficult, and the *DAS Administration d Scoring Manual* provides many example of what is correct and incorrect drawings, the following are noted:

arefully study the scoring procedures in Appendix B (pp. 417-431) of the Manual and become proficient in the use of the two transparent scoring mplates provided in the DAS kit. Examiners must be careful to use Set B (not A) to score straightness of lines. It would be prudent to attach a minder note to your scoring template.

ntil you are fully familiar with the scoring criteria, rather than trying to score each item as it is produced (in order to follow the 3 by 3 rule) examiners ould simply administer all of the items in the age appropriate block. This speeds up administration time and, in the vast majority of cases in our perience, there was no need to go back or continue on with the next block. As one gains more experience with the scoring, it becomes fairly evident hen a design has failed or when the designs are perfectly drawn.

s important to watch as the child draws the designs since the examiner must determine if any added lines are due to poor coordination or if the child dicates that additional lines were not intended. Small gaps are also acceptable if they are due to crudeness, not memory problems. If either is the se, the child should not be penalized. Decorative additions as well as overworked, feathered, or scribbled lines are generally acceptable. The child ay also use one of the edges of the paper as one line of drawing.

e aware that the criteria given for scoring refer to the criteria for a specific score (e.g., a 1- or 2-point criteria). For example, the Manual notes that riteria for 2 points: lines are straight according to Set B (H, I fail)." Although the figures H and I fail this criterion, they are not scored as 0 points. hey are scored as 1 point since they failed only the 2-point criteria. Examiners should study the criteria, practice scoring, score very carefully with the ovided templates, and seek second opinions from colleagues until they become truly proficient in scoring this subtest.

though, as noted above, Recall of Designs is not highly correlated with other DAS memory subtests, a child with a serious memory weakness might e penalized on this subtest and might appear to have lower Spatial ability than is actually the case. Examiners should be alert to this possibility.

Pattern Construction

ormed for ages 3:0 to 17:11 (Usual age range is 3:6 to 17:11; Out of level age range is 3:0 to 3:5).

is subtest assesses visual-spatial ability; perception of spatial orientation; analysis of visual data; and nonverbal reasoning. The presentation oklet is two-dimensional while blocks are three-dimensional. The task requires the child to make a two-dimensional construction while ignoring the rd dimension.

oung children create designs using foam squares with sides of black or yellow. Older children use three-dimensional blocks with sides that are black, llow, black and yellow divided diagonally, and black and yellow divided vertically. Items begin as two-block patterns and increase to 9 block tterns. Daniel (1986) found that flat squares and cubic blocks measured the same ability with a group of sixth grade children. Elliott (1990b, p. 48) etermined that, for younger children, the flat squares were less confusing.

is subtest can be scored in one of two ways, Standard and Alternative (Unspeeded). Standard scoring is dependent upon both speed and accuracy, hile Alternative (Unspeeded) is dependent solely on accuracy, although time limits are still enforced.

e Pattern Construction subtest contains a total of 26 items. Items are generally scored from a minimum (failure) of 0 points to a maximum (correct construction with bonus points for speed) in the Standard administration. In the Alternative (Unspeeded) administration, scoring is pass-fail (2 points r first trial, 1 for second trial, when available, and 0 for failure or exceeding the time limit). Three different starting points are available (age 3:0 to 11 start at sample A and item 1; 7:0 to 12:11 start at sample C and item 8; 13:0 to 17:11 start at sample D and item 14). There is a typographical ror on p. 221 in at least some printings of the Manual. The starting-point samples are wrong for two ages and should be the same as above and the me as those shown on p. 210 and in the protocol. The last three items are provided for those cases in which the examiner chooses to score the btest using the untimed, alternative procedure.

actor analytic findings

e Pattern Construction subtest is considered a fair measure of g across all ages (overall r = .65). For ages 3 to 11, it has fair g loadings, while from es 12 to 17, it is considered to have good g loadings. This subtest contributes substantially to the Spatial factor (loading = .82). Specificity is ample r all age groups 6:0 to 17:11.

eliability and correlational highlights

attern Construction is considered to possess high overall reliability (r = .91), with reliability coefficients ranging from .80 to .93 across all of the age oups It correlates best with Recall of Designs (r =.57) and least with Recall of Objects (r = .15). It has a moderate correlation with the GCA ***r*** = .77).

f-Gc classification

the Broad stratum definition of abilities, Pattern Construction is considered to be a logical measure of Visual Processing (Gv). In the Narrow stratum abilities, it is considered to be a probable measure of Spatial relations (SR) and a possible measure of Visualization (VZ) (McGrew & Flanagan, 98, p. 106).

dministrative and interpretive considerations

e Pattern Construction subtest is described on pages 210 to 221 in the *DAS Administration and Scoring Manual* and discussed on pages 48 to 50 d 57 in the *DAS Introductory and Technical Handbook.* The record form has helpful notations for all items -- M, P, or D -- referring to the method for esenting the items to the child: Model (M) refers to the examiner building the pattern in front of the child and then leaving the completed model in ace while the child builds his or her pattern. Picture (P) refers to showing the child a picture of the pattern from either Booklet 2 (items 1 through 7) or oklet 1 (sample c through item 26) and leaving the picture in full view while the child completes the pattern. Finally, Demonstrate (D) refers to those ses in which the examiner builds the pattern using the child's own blocks, and then mixes the pattern up and has the child try again. In five specific ses, there are multiple notations, so that, for example, "M, P" for item 1 means that the examiner creates the model as well as shows the picture to e child.

ome children try to complete the patterns by building their designs directly on top of the model or the picture. On early items, this strategy may be lpful, but on later items, where the picture is much smaller than the blocks themselves, the use of this strategy results in their actually covering up e pictures they are trying to copy. If this is the case, the child should be encouraged to make the patterns on the table directly in front of the child.

though rotations of 30 degrees or more are scored as 0, in all cases that rotations occur the examiner should show the child the rotation and indicate w the pattern should have been made.

ming is important on this subtest since, since in the timed administration bonus points are given for successful completion within certain time frames. ming of the subtest begins when the examiner finishes with the instructions and continues until the child has completed the item. Because many ildren often do not tell the examiner when they are done, examiners should watch the construction carefully and note the time at which the pattern is ccessfully completed. Stop the watch when the child indicates by word or gesture, that he or she is complete. If the child has not changed the sign successfully completed earlier, give credit for the earlier time.

e DAS Pattern Construction subtest allows for an Alternative (Unspeeded) administration. If the examiner feels that the imposition of the strict time its is not a fair or valid procedure (e.g., a motor impairment prevents speedy manipulation of the blocks or the child is a slow, thoughtful worker) the ternative scoring procedure can be utilized. In this case, examiners should refer to the Alternative starting, decision, and stopping points on p. 221 of e Manual and in the record form. In general, if one chooses to score with the Alternative procedure, more items must be administered. Items 24-26 e administered only as part of Alternative scoring. According to the Manual (Elliott, 1990a. pp. 210, 220) The choice between the Standard and ternative administrations need not be made in advance. However, because the examiner must administer any needed additional items the decision ust at least be contemplated before completing the subtest.

e Alternative (Unspeeded) procedure is a valuable option. Like the Stanford-Binet, 4th ed. (SB: FE), and unlike the Wechsler scales with their heavy phasis on speed (see Chapters XX and XX), the Alternative procedure offers more valid assessment of the abilities of students who, for any ason work slowly.

e decision points for the Pattern Construction subtest may at first appear a bit confusing: <3 with less than maximum score: Continue; <3 First-trial sses: Go Back. This is the 3 by 3 rule with the slight twist that failure is not a requirement. In order to discontinue at the decision point, a child needs pass (with any amount of credit) 3 items and additionally must obtain less than perfect (<u>not</u> necessarily zero) scores on 3 items. These authors have und that placing some mark in the margin next to the scoring table on the record form helps to keep track of any less than perfect (e.g., 3 points on item for which 4 points are possible) scores. If it is found that there are only 1 or 2 marks (<3 with less than maximum) this signals us to continue sting through the next block.

Copying

ormed for ages 3:6 to 7:11 (Usual age range is 3:6 to 5:11; Extended Age range is 6:0 to 7:11).

is subtest assesses fine-motor ability and the ability to perceive similarities between figures. Items start very simple (straight line) and progress to ore complex geometric figures. No items are timed. The child sees the design the entire time while drawing.

ere are 20 items on this subtest. Children aged 3:6 to 4:11 start with item 1, 5:0 to 5:11 start at item 5, while all others start at item 11. One item is ored as 0-1, fourteen items are scored 0-2, and the remaining five items are scored 0-3.

ctor analytic findings

e Copying subtest is considered a fair measure of g across all ages (overall r = .59). This subtest contributes moderately to the Nonverbal factor ading = .61). Specificity is ample for all age groups.

eliability and correlational highlights

pying is considered to possess medium overall reliability (r = .86), with reliability coefficients ranging from .82 to .88 across all of the nine age oups. It correlates best with Block Building (r =.51) and least with Recall of Objects (r = .14). It has a medium correlation with the GCA *(r* = .65).

-Gc classification

the Broad stratum definition of abilities, Copying is considered to be a logical secondary measure of Visual Processing (Gv). In the Narrow stratum abilities, it is considered to be a possible measure of both Visualization (VZ) and Finger Dexterity (P2) (McGrew & Flanagan, 1998, p. 110).

dministrative and interpretive considerations

e Copying subtest is described on pages 111 to 145 in the *DAS Administration and Scoring Manual* and discussed on pages 53 and 54 in the *DAS troductory and Technical Handbook* The child is to draw the designs on paper provided that has been cut into sheets approximately 4 inches high by nches wide. These authors have often found that having available a stapler or a paperclip can be very useful and prevent the problem of losing all e loose sheets of paper. It has also been suggested that examiners simply fold an 8 by 11-inch paper into quarters and allow the child to draw on the ded page. For each subsequent design, simply turn the page over to a new folded section. At the end of the subtest, you will have all the designs awn in separate sections of the paper.

second attempt at drawing the designs is allowable if the child is dissatisfied with the initial drawing. The examiner should not cue the child to this ssibility. When a child does spontaneously attempt a second copy, score the better of the two attempts.

though the child is allowed to rotate the paper to any position he or she wishes, the scoring of the final design is dependent on correct orientation. xaminers should get into the habit of numbering each sheet (or quadrant of the large, folded sheet) in the same place and also placing an arrow or me other mark on the paper if the child rotates the sheet so as to be able to correctly score each item later.

though scoring is not difficult, and the *DAS Administration and Scoring Manual* provides many examples of what are correct and incorrect drawings, e following are noted:

arefully study the scoring procedures in Appendix B (pp. 417-431) of the Manual and become proficient in the use of the two transparent scoring mplates provided in the DAS kit. Examiners must be careful to use Set B (not A) to score straightness of lines. It would be prudent to attach a minder note to your scoring template.

ntil you are fully familiar with the scoring criteria, rather than trying to score each item as it is produced (in order to follow the 3 by 3 rule) examiners ould simply administer all of the items in the age-appropriate block. This procedure speeds up administration time and, in the vast majority of cases our experience, there was no need to go back or continue on with the next block. As one gains more experience with the scoring, it becomes fairly ident when a design has failed or when the designs are perfectly drawn.

s important to watch as the child draws the designs since the examiner must determine if any added lines are due to poor coordination or if the child dicates that additional lines were not intended. Small gaps are also acceptable if they are due to crudeness, not misperception of the design. If either the case, the child should not be penalized. Decorative additions as well as overworked, feathered, or scribbled lines are generally acceptable. The ild may also use one of the edges of the paper as one line of drawing.

e aware that the criteria given for scoring refers to the criteria for a specific score (e.g., a 1- or 2-point criteria). For example, the Manual notes that riteria for 2 points: lines are straight according to Set B (H, I fail)." Although the figures H and I fail this criterion, they are not scored as 0-points. ey are scored as one point since they failed only the 2-point criteria.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Matrices

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 17:11; Out of level age range is 5:0 to 5:11).

is subtest assesses nonverbal, inductive reasoning ability; ability to formulate and test hypotheses; verbal mediation; and visual perception.

e Matrices subtest contains a total of 33 items. Each matrix problem is a square of 4 to 9 cells with a blank cell in the lower right corner. The child ooses from 4 to 6 alternatives. Responses are scored 1, or 0. Three different starting points are available (age 5:0 to 7:11 start at item 1; 8:0 to :11 start at item 5; 11:0 to 17:11 start at item 15).

ctor analytic findings

e Matrices subtest is considered a fair measure of g across all ages (overall r = .71). For ages 6:0 to 7:11 and from 15:0 to 17:11, the g loading is nsidered fair while at the remaining ages (8:0 to 14:11) the g loading is considered good. This subtest contributes substantially to the Nonverbal easoning factor (loading = .74). Specificity is ample for all age groups 6:0 to 17:11.

eliability and correlational highlights

atrices is considered to possess medium overall reliability (r = .82), with reliability coefficients ranging from .72 to .87 across all of the 13 whole-age oups It correlates best with Sequential & Quantitative Reasoning (r =.58) and least with Recall of Objects - Delayed (r = .14). It has a moderate rrelation with the GCA *(r* = .76).

-Gc classification

the Broad stratum definition of abilities, Matrices is considered to be a strong measure of Fluid Intelligence (Gf). In the Narrow stratum of abilities, it considered to be a probable measure of Induction (I) (McGrew & Flanagan, 1998, p. 122).

dministrative and interpretive considerations

e Matrices subtest is described on pages 222 to 225 in the *DAS Administration and Scoring Manual* and discussed on pages 58 and 59 in the *DAS troductory and Technical Handbook.* To aid examiners in the scoring of the subtest, correct responses are highlighted in bold, blue ink on the record rm, which must be shielded from the student.

atrices stimuli are found in Booklet 2. Examiners will soon discover that all subtests, with the exception of Matrices, have the stimuli presented with ooklet 2 opened as if it were a book. Matrices requires that the booklet be turned sideways in order to correctly present the stimuli. The multiple-oice format and the difficulty of some items sometimes lead to haphazard guessing. The examiner must encourage careful work.

ree samples and one item are teaching items if the child fails them. The fourth sample is a teaching item, even if the child passes it. Correct sponses are acknowledged on teaching items.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Sequential & Quantitative Reasoning

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 17:11; Out of level age range is 5:0 to 5:11).

his subtest assesses nonverbal reasoning; the ability to perceive relationships; to draw conclusions (inductive reasoning); to formulate and test ypotheses; to use analytic reasoning; and long term information retrieval. The lower items require visual perceptual-motor skills, and the higher ones emand arithmetic computation skills.

he Sequential & Quantitative Reasoning subtest contains a total of 39 items. Responses are scored 1 or 0. Four different starting points are available ge 5:0 to 8:11 start at item 1; 9:0 to 10:11 start at item 8; 11:0 to 14:11 start at item 16, and 15:0 to 17:11 start at item 24). Items 1 through 15 are esented in a consumable booklet in which the child responds by drawing the missing figure in the appropriate space. Each of the final 24 items is esented in a stimulus booklet. For these items the child responds orally, typically with a single oral response. The child is shown two pairs of umbers. Each pair is related by the same arithmetic rule (e.g., the second number is three greater than the first or the second number is twice the st number less one). The child must derive the rule from the two pairs and apply the rule to another number to create a third pair following the same le.

actor analytic findings

he Sequential & Quantitative Reasoning subtest is considered a good measure of g across all ages (overall r = .76). This subtest contributes bstantially to the Nonverbal Reasoning factor (loading = .80). Specificity is ample for all age groups 6:0 to 17:11.

eliability and correlational highlights

equential & Quantitative Reasoning is considered to possess medium overall reliability (r = .85), with reliability coefficients ranging from .78 to .88 ross all of the 13 whole-age groups It correlates best with Matrices (r =.54) and least with Recall of Objects - Delayed (r = .14). It has a moderate rrelation with the GCA *(r* = .79).

f-Gc classification

the Broad stratum definition of abilities, Sequential & Quantitative Reasoning is considered to be a strong measure of Fluid Intelligence (Gf). In the arrow stratum of abilities, it is considered to be a probable measure of both Induction (I) and Quantitative Reasoning (RQ) (McGrew & Flanagan, 998, p. 126).

dministrative and interpretive considerations

he Sequential & Quantitative Reasoning subtest is described on pages 241 to 246 in the *DAS Administration and Scoring Manual* and discussed on ages 62 and 63 in the *DAS Introductory and Technical Handbook.* To aid examiners in the scoring of the subtest, correct responses are found on ages 244 (items 1-15) and 246 (items 16-39). We have found it useful to copy the answer and the mathematical operations used to arrive at that nswer onto the record form itself. This allows item analysis of errors. For example, the correct answer to item 16 is 6, found by subtracting 1 from the imulus item 7. If a child responds with 8 as the answer, the examiner might hypothesize that the child understood the underlying concept but applied e incorrect mathematical process. If this is found to be a recurrent theme, it may suggest things other than typical cognitive abilities. Although equential and Quantitative Reasoning is considered (correctly, we believe) by McGrew & Flanagan (1998) a "strong measure" of Fluid Intelligence, nd despite Elliott's (1990b, p.62) effort to make the arithmetic demands "very easy for the ages at which they are given," the influence of simple mpetence in basic arithmetic calculation can in some cases overwhelm the Induction (I) and Quantitative Reasoning (RQ) Fluid Intelligence narrow bilities, listed as "probable" narrow abilities by McGrew & Flanagan (1998). Sequential and Quantitative Reasoning (and therefore the Nonverbal easoning cluster) may not be a valid measure of reasoning ability for a student who has difficulty recalling basic arithmetic "number facts" (sums and fferences), even if the child otherwise has good Quantitative Reasoning (RQ) abilities. In other cases, a weakness in Quantitative Reasoning (RQ) ay offset a strength in Induction (I), resulting in an equivocal score. Sequential and Quantitative Reasoning has a correlation of .57 with the DAS asic Number Skills achievement test.

ems 1 through 15 are presented in a consumable booklet in which the child responds by drawing the missing figure in the appropriate space. xaminers may wish to have the child draw his or her response on a separate piece of paper, thus saving the consumable booklet for additional dministrations.

Verbal Comprehension

ormed for ages 2:6 to 6:11 (Usual age range is 2:6 to 5:11; Extended age range is 6:0 to 6:11).

erbal Comprehension assesses the child's understanding of the language through the receptive mode. None of the items on this subtest requires an al response. Items tap a child's ability with syntax and prepositional and relational concepts; the ability to formulate and test hypotheses; the ability follow verbal directions; and short-term auditory memory.

here are 36 items on this subtest. Children aged 2:6 to 3:11 start with item 1, while all others start at item 13. All items are scored as 1 or 0. Although me items require the child to acknowledge more than one item (e.g., item 15 requires that the child give to the examiner 3 toys that share some mmon characteristic), no partial credit is given on any item.

he first items use a picture of a Teddy Bear on which the child points to several features. Next the child is shown an array of toys which samples the ild's understanding of names, of commands, and of functions. The next level measures the child's ability to understand prepositions, and the final ms demonstrate the child's ability to understand complex instructions.

actor analytic findings

he Verbal Comprehension subtest is considered a good measure of g across all ages (overall r = .76). For ages 2:6 to 4:11, it has good g loadings, hile from ages 5:0 to 6:11, it is considered to have fair g loadings. This subtest contributes substantially to the Verbal factor (loading = .81). pecificity is ample for all age groups.

eliability and correlational highlights

erbal Comprehension is considered to possess medium overall reliability (r = .84), with reliability coefficients ranging from .74 to .86 across all of the ge groups. It correlates best with Naming Vocabulary (r =.64) and least with Recall of Objects (r = .18). It has a moderate correlation with the GCA *(r* .79).

f-Gc classification

the Broad stratum definition of abilities, Verbal Comprehension is considered to be a logical measure of Crystallized intelligence (Gc). In the Narrow ratum of abilities, it is considered to be a probable measure of Language Development (LD) and Listening Ability (LS) (McGrew & Flanagan, 1998, p.).

dministrative and interpretive considerations

he Verbal Comprehension subtest is described on pages 72 to 77 in the *DAS Administration and Scoring Manual* and discussed on page 45 in the *AS Introductory and Technical Handbook.* For this subtest, all the words spoken by the examiner are printed on the protocol itself. All instructions ay be repeated once if the child has not responded to the initial instruction or if the child asks for repetition. Examiners should say "Listen carefully" if ecessary to gain the child's attention.

xteen of the 36 items begin with the words, "Give me . . ."For these items, the examiner should hold out an open hand so the child will place the ject(s) there. It is permissible for the child to simply push the object toward the examiner.

ems 1 through 6 require the child to point to parts of a pictured Teddy Bear. Although most of the directions ask the child to indicate plural parts (e.g., eddy's eyes), the child is given credit if he or she indicates either one or both of the body parts. Items 7 through 18 utilize the box of toys. Be sure to ke the items out of the box but do not name the items. The box should remain on the table through these items. Items 19 through 29 use objects ested in an inset tray. The examiner names the objects before administering item 19. Positioning of objects (laying them flat or standing them up) and king items out of the inset tray or leaving them in the inset tray do not effect the scoring of the items. Before administering the final items (30-36) with lored, plastic chips, the examiner must make sure the child can identify the shapes and colors. If the child cannot, the test is terminated. If the child nnot identify the colors on request, the child should, as a precaution, be tested for color vision.

the examiner observes language difficulties on this subtest, it would be prudent to attempt further language assessment. The Oral and Written nguage Scales (OWLS) (Carrow-Woolfolk, 19xx) offers relatively brief receptive and expressive language testing that can be administered by a ychologist as well as by a speech and language pathologist.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Naming Vocabulary

ormed for ages 2:6 to 8:11 (Usual age range is 2:6 to 5:11; Extended Age range is 6:0 to 7:11, and the Out of level age range is 8:0 to 8:11).

is subtest assesses the spoken vocabulary of young children. It measures expressive language ability; ability to match; general language evelopment; and word retrieval from long-term memory. The items require the child to recall words from long-term memory rather than recognize or nderstand the meaning of words.

e subtest consists of two objects (a piece of paper and a box) and a booklet of colored pictures of objects which the child is shown one at a time d asked to name.

ere are 24 items on this subtest. Children aged 2:6 to 4:5 start with item 1, while all others start at item 8. All items are scored as 1 or 0.

actor analytic findings

e Naming Vocabulary subtest is considered a fair measure of g across all ages (overall r = .69). This subtest contributes moderately to the Verbal ctor (loading = .71). Specificity is ample for all age groups.

eliability and correlational highlights

aming Vocabulary is considered to possess Low overall reliability (r = .78), with reliability coefficients ranging from .64 to .84 across all of the nine e groups. It correlates best with Early Number Concepts (r =.51) and least with Recall of Objects (r = .16). It has a medium correlation with the GCA = .71).

f-Gc classification

the Broad stratum definition of abilities, Naming Vocabulary is considered to be a logical measure of Crystallized intelligence (Gc). In the Narrow ratum of abilities, it is considered to be a probable measure of both Language Development (LD) and Lexical Knowledge (VL) (McGrew & Flanagan, 98, p. 102).

dministrative and interpretive considerations

e Naming Vocabulary subtest is described on pages 81 to 85 in the *DAS Administration and Scoring Manual* and discussed on page 47 in the *DAS troductory and Technical Handbook.*

e protocol provides the correct, 1-point answers for each item. Examiners should note that there are also "other acceptable responses" listed on ges 83-85 in the Manual. Some confusion may be present on page 82 of the Manual. In describing the scoring of this subtest, it is noted that "Score point for a correct response, 0 points for an incorrect response." The Manual then provides three examples of what are considered incorrect sponses (descriptions of the function of the item, material or parts of the item, and an overly general name for the item). Although each of these is nsidered an incorrect response, the Manual also notes that in each of these cases, the examiner should query the child. It is only if the child, after ıerying, does not elaborate or change the response that the score of 0 is given. This questioning procedure is more extensive than that on most dividual intelligence tests, except the SB: FE.

the child has difficulty with the Naming Vocabulary subtest, the examiner should follow up with both a more extensive picture-naming test, such as e Expressive Vocabulary Test (EVT; Williams, 1997) and a receptive vocabulary test, such as the Peabody Picture Vocabulary Test, 3rd ed. (PPVT- ; Dunn & Dunn, 1997).

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Picture Similarities

ormed for ages 2:6 to 7:11 (Usual age range is 2:6 to 5:11; Out of level age range is 6:0 to 6:11).

cture Similarities is a non-verbal subtest that assesses a child's reasoning ability. This task does not require a verbal response from the child. It flects the child's ability to solve nonverbal problems, to identify pictures, to formulate and test hypotheses, to use verbal mediation, and to attach eaning to pictures.

or each item, the child is shown a row of pictures or designs in a booklet. The child places a fifth card with a single picture or design below the mulus picture that it best goes with. The child is asked to recognize a relationship based upon a common concept or element. The child must erceive various, possibly relevant features of drawings and engage in hypothesis testing to select the correct elements of commonality. The lationships become increasingly complex as the subtest progresses.

here are 32 items on this subtest. Children aged 2:6 to 4:5 start with item 1, while all others start at item 11. All items are scored as correct or correct.

actor analytic findings

he Picture Similarities subtest is considered a fair measure of g across all ages (overall r = .53). This subtest contributes moderately to the Nonverbal ctor (loading = .55). Specificity is ample for all age groups.

eliability and correlational highlights

cture Similarities is considered to possess Low overall reliability (r = .76), with reliability coefficients ranging from .33 to .84 across all of the nine age oups. It correlates best with Early Number Concepts (r =.44) and least with Recall of Objects (r = .17). It has a medium correlation with the GCA *(r =* 5).

f-Gc classification

the Broad stratum definition of abilities, Picture Similarities is considered to be a logical measure of Fluid intelligence (Gf). In the Narrow stratum of ilities, it is considered to be a probable measure of Induction (I) (McGrew & Flanagan, 1998, p. 100).

dministrative and interpretive considerations

he Picture Similarities subtest is described on pages 78 to 80 in the *DAS Administration and Scoring Manual* and discussed on page 46 in the *DAS troductory and Technical Handbook.*

dministration of this subtest is fairly straightforward. The examiner provides the child with one card at a time and instructs the child to place the card nder the one picture (out of four) that it best goes with. Vertical lines between the pictures on the response booklet help the examiner determine how score the items. Examiners should question any response that seems unclear.

though the *DAS Administration and Scoring Manual* notes that the cards should be placed on the table and presented to the child one at a time, we ave experienced children picking up the cards from the table and then, unfortunately, dropping them onto the floor. We have found that if examiners old the cards in their hands and present them one at a time, the chance of them dropping is lessened.

ccasionally, a child with serious communication difficulties, such as hearing loss or Pervasive Developmental Disorder, will earn a much higher score n Picture Similarities than on the other DAS preschool subtests. Rather than either ignoring this hint of higher intellectual ability or overinterpreting a ngle subtest score, the examiner should seek a more comprehensive intelligence test with a similar nonlanguage format and abstract conceptual emands, such as the Leiter International Performance Scale-Revised (Roid & Miller, 1997).

Early Number Concepts

ormed for ages 2:6 to 7:11 (Usual age range is 3:6 to 5:11; Extended Age range is 6:0 to 6:5, and the Out of level age ranges are 2:6 to 3:5 and 6:6 7:11).

nis subtest assesses ten areas of number concepts and skills. Among the areas are reciting, counting, matching, comparing, recognizing, and lving number concepts.

nere are 28 items on this subtest. Children aged 2:6 to 4:5 start with item 1 (counting and pointing), while ages 4:6 to 6:5 begin at item 2, and all hers start at item 16. All items except item 1 are scored as 1 or 0. Item 1 (reciting and pointing to ten chips) is scored as 0-3 for both counting rrectly as well as pointing correctly. The child may obtain a maximum of 6 points (3 for correct counting and an additional 3 for correct pointing). If e score on the first administration of this item is less than 6, the examiner administers the item again and the child receives the higher of the two ores for reciting as well as the higher of the two scores for pointing.

actor analytic findings

ne Early Number Concepts subtest is considered a good measure of g across all ages (overall r = .82). This subtest does not contribute to either of e two factors (Verbal and Nonverbal). Specificity is ample for all age groups.

eliability and correlational highlights

arly Number Concepts is considered to possess medium overall reliability (r = .86), with reliability coefficients ranging from .53 to .88 across all of the ne age groups. It correlates best with Verbal Comprehension (r =.61) and least with Recall of Objects (r = .19). It has a high correlation with the GCA = .82).

f-Gc classification

the Broad stratum definition of abilities, Early Number Concepts is considered to be a logical measure of Quantitative Knowledge (Gq). In the arrow stratum of abilities, it is considered to be a probable measure of both Math Achievement (A3) and Mathematical Knowledge (KM) (McGrew & anagan, 1998, p. 108). The relatively high correlation with Verbal Comprehension substantiates the subjective impression that language mprehension is also tapped by Early Number concepts.

dministrative and interpretive considerations

ne Early Number Concepts subtest is described on pages 101 to 108 in the *DAS Administration and Scoring Manual* and discussed on pages 51 and in the *DAS Introductory and Technical Handbook* Scoring for Item 1 ranges from 0 to 6 points. Examiners should be sure to read Appendix A coring procedure for Early Number Concepts, Item 1 pp. 415-6) to understand the task and the scoring principles. Certain items ask the child to give verbal response while others ask the child to point to certain numerals. In either case, the child should be scored as correct if the response given is rrect, regardless of the manner in which the response is given. Early Number Concepts is a subtest that requires practice for smooth administration.

Word Definitions	Similarities	Matrices	Sequential & Quantitative Reasoning
Recall of Designs	Pattern Construction	Block Building	Verbal Comprehension
Picture Similarities	Early Number Concepts	Naming Vocabulary	Copying

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Recall of Objects

ormed for ages 4:0 to 17:11

his subtest assesses short term and immediate term verbal recall with an added visual component. It taps verbal encoding, rehearsal, and retrieval rategies. A child views a card containing pictures of 20 common objects for a specified period of time. After the card is removed from view, the child peats back to the examiner, in any order, the items that he or she can remember. There is a total of three trials to learn the items, with the objects amed for the child on the first trial. A Delayed Recall trial is administered 10 to 15 minutes later in the testing session with no cueing that the recall ll be given.

he Recall of Objects subtest contains a total of 20 items. One point is awarded for each correctly recalled object. If the child clearly remembers the bject but misnames it (e.g., rat for mouse) the response is scored as correct. This subtest does not employ any starting or stopping rules since all ildren take all three immediate recall trials. The single exception to this is for the child who correctly remembers all 20 items on both the first and cond immediate recall trials. When this is the case, the third trial is not given, but the child is given 20 points for the third, un-adminstered trial (for a tal of 60 points).

actor analytic findings

he Recall of Objects subtest is considered a poor measure of g across all ages (for ages 4:0 to 5:11 r = .27, for ages 6:0 to 17:11 r = .35). Specificity ample for all age groups 4:0 to 17:11.

eliability and correlational highlights

ecall of Objects is considered to possess low overall reliability (r = .74), with reliability coefficients ranging from .66 to .83 across all of the age oups. It has low correlations with all other subtests (mean r =.26) in the battery with the exception of Recall of Objects-delayed recall (r = .68).

f-Gc classification

the Broad stratum definition of abilities, Recall of Objects is considered to be a logical secondary measure of both Long-term Storage and Retrieval lr) and Visual Processing (Gv). In the Narrow stratum of abilities, it is considered to be a probable measure of Free Recall Memory (M6) and a ossible measure of Visual Memory (MV). (McGrew & Flanagan, 1998, p. 104).

dministrative and interpretive considerations

he Recall of Objects subtest is described on pages 86 to 88 as well as on pages 207 to 209 in the *DAS Administration and Scoring Manual* and scussed on pages 67 and 68 in the *DAS Introductory and Technical Handbook.* If for some reason, one of the three trials is spoiled or unscorable, aminers may estimate the three-trial score by multiplying the sum of the two trials by 1.5, and rounding the result up to a whole number.

ote that the exposure times for the three immediate trials is 60, 20, and 20 seconds respectively. On the first trial, while the directions are being given the child and the examiner is naming the pictures, the pictures are exposed to the child. For the second and third trials, the directions are given efore the card is exposed.

he Delayed-recall trial should be administered after at least a 10-, but no more than 30-minute delay. Care should be taken to administer this subtest the sequence presented in the record form. This will assure that the intervening subtests are not likely to interfere with the content of the Recall of bjects subtest.

o not interpret the delayed-recall score unless there is at least a 14-point T score difference between the Immediate- and Delayed-Recall scores (this fference would indicate significance at the $p < .10$ level).

may at times be useful to item analyze the objects recalled on each trial to develop some hypothesis about the strategies that the child is employing remember the objects. Does the child remember them in the same order in which they are presented, or does the child clump them into categories? oes the child use an inefficient "replacement" strategy in which he or she forgets the items from one trial in order to remember the new items in nother trial?

xaminers can accelerate recording by omitting vowels and using other abbreviations. Be sure to distinguish clearly between "ball" and "bowl." Be areful not to give credit for items repeated (perhaps with different names, e.g., "rat" and "mouse") on a single trial. However, if the child asks if it is all ght to repeat words, briefly and quietly reassure the child that it does not matter.

he Manual may cause some trouble because it lists, in the tables for converting ability scores to T scores, the column entries for Recall of Digits after e columns for Recall of Objects. This is opposite to the order in which the subtest scores appear on the protocol summary form. Consequently, aminers must be alert to avoid the mistake of entering the wrong column when starting with Recall of Digits. Also the Record Form places the Raw core to Ability Score conversion table for the Immediate trials next to the box for recording the child's responses on the Delayed trial. Examiners must e careful not to enter the conversion table for the Immediate trials with the raw score from the Delayed trial.

he Manual and Record form give time limits for the student's responses on the Immediate (60, 40, and 40 seconds, respectively) and Delayed (60 conds) trials. If the child is still recalling additional items at the time limit, you should allow the child to finish. Mark the number of items recalled thin the time limit, but continue recording additional items. Since the test is a measure of recall, but not necessarily a test of speeded recall, allowing child to continue beyond the time limits affords the examiner additional information about memory storage and memory retrieval.

Recall of Objects | Recall of Digits | Recognition of Pictures
Speed of Information Processing | Matching Letter-Like Forms
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Recall of Digits

ormed for ages 2:6 to 17:11 (Usual age range is 3:0 to 17:11; Out of level age range is 2:6 to 2:11).

his subtest assesses short-term auditory sequential recall. The child repeats back to the examiner a sequence of digits presented orally. The items e arranged in eight "blocks" of increasingly long digit sequences. Sequences start with 2 digits and increase progressively up to 9 digits.

actor analytic findings

he Recall of Digits subtest is considered a fair measure of g for ages 2:6 to 2:11 (r = .58) and a poor measure of g for all remaining ages (mean r = 1). Specificity is ample for all age groups 2:6 to 17:11.

eliability and correlational highlights

ecall of Digits is considered to possess medium overall reliability (r = .87), with reliability coefficients ranging from .85 to .90 across all of the age oups. It has low correlations with all other subtests (mean r =.24) in the battery.

-Gc classification

the Broad stratum definition of abilities, Recall of Digits is considered to be a logical measure of both Short-term Memory (Gsm). In the Narrow ratum of abilities, it is considered to be a probable measure of Memory Span (MV) (McGrew & Flanagan, 1998, p. 114).

dministrative and interpretive considerations

he Recall of Digits subtest is described on pages 249 to 250 in the *DAS Administration and Scoring Manual* and discussed on page 66 in the *DAS troductory and Technical Handbook.* This is one of the few subtests on the DAS that utilizes a basal and ceiling rule for selecting items. The asal/ceiling procedure allows the examiner to give only those items that the child has a reasonable chance of passing and does not require the child repeat items of the same length when the expectation is that he or she would pass them with certainty. The items are arranged in eight "blocks" of creasingly long digit sequences. Each child begins with item number 1 (the item number is circled on the record form). If the or she correctly repeats e sequence the examiner proceeds to the next block, and administers the first item in that block (circled). Continue with the first item on each block ntil the child makes a mistake. When the child fails the first item of a block, go back to the previous block and administer the remaining items in that ock. If the child fails more than 1 item in a block, continue backward until the child has no more than one failure in the block. This block becomes the asal. Test forward until the child passes no more than one item in a block. That block becomes the ceiling.

n this subtest, unlike most other DAS subtest, credit is given for items not administered below the basal.

ems are administered at a rate of two digits per second. The use of such a "fast" presentation prevents the child from using a verbal rehearsal rategy during the presentation, making the subtest a purer measure of short-term auditory memory. Examiners should practice reading digits at this te with a metronome or clock.

here is no "digits-reversed" aspect to this subtest. A test of "digits-forward" requires different abilities than does a task of "digits-reversed." The first quires a basic short-term memory while the latter requires different processing since the child must not only remember the digits but must also anipulate (reverse) them.

ome examiners may simply score this subtest by marking whether the child got the items correct or incorrect and not take the time to accurately cord how the child actually repeats back the numbers. These authors strongly suggest that examiners take the time to record verbatim the sequence numbers that the child remembers. This information can be potentially very useful in determining if there is a generalized memory problem emembering few numbers but in correct sequence), a sequencing problem (remembering all the correct numbers but in the wrong order), or some her potential problem.

Recall of Objects | Recall of Digits | Recognition of Pictures

Speed of Information Processing | Matching Letter-Like Forms

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Matching Letter-Like Forms

ormed for ages 4:6 to 7:11 (Usual age range is 4:6 to 5:11; Out of level age ranges are 4:0 to 4:5 and 6:0 to 7:11).

is subtest assesses visual discrimination and awareness of spatial orientation. It contains a total of 27 items, each scored as correct or incorrect. vo starting points are available (age 4:0 to 5:11 start at item 1, while 6:0 to 7:11 start at item 10).

actor analytic findings

e Matching Letter-Like Forms subtest is considered a fair measure of g for all ages (r = .55). Specificity is ample for all age groups.

eliability and correlational highlights

atching Letter-Like Forms is considered to possess medium overall reliability (r = .85), with reliability coefficients ranging from .49 to .87 across all of e age groups It has moderate correlations with all other subtests (mean r =.34) in the battery.

f-Gc classification

the Broad stratum definition of abilities, Matching Letter-Like Forms is considered to be a logical measure of Visual Processing (Gv). In the Narrow ratum of abilities, it is considered to be a probable measure of Visualization (VZ) (McGrew & Flanagan, 1998, p. 112).

dministrative and interpretive considerations

e Matching Letter-Like Forms subtest is described on pages 247-8 in the *DAS Administration and Scoring Manual* and discussed on pages 64 and 5 in the *DAS Introductory and Technical Handbook.* To aid examiners in the scoring of the subtest, correct responses are highlighted in bold, green k on the record form. Be sure to record the child's actual responses so that you can later analyze errors.

Recall of Objects | Recall of Digits | Recognition of Pictures
Speed of Information Processing | Matching Letter-Like Forms
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Speed of Information Processing

ormed for ages 5:0 to 17:11 (Usual age range is 6:0 to 7:11; Out of level age range is 5:0 to 5:11).

nis subtest assesses mental speed. Examiners use one of three booklets: Booklet A for ages 5:0 to 8:11; Booklet B for ages 9:0 to 12:11; and ooklet C for ages 13:0 to 17:11. The child uses a pencil to mark the correct answer (the circle with the most boxes or the highest number in a articular row of numbers). Each booklet contains 2 non-scored teaching items followed by 6 pages of scored items. The task is a relatively simple ne, and one on which almost all children should succeed. The differences in abilities are measured by the speed in which the child completes the sk. Children earn from 0 to 6 points per page depending on the speed of correct responses.

actor analytic findings

ne Speed of Information Processing subtest is considered a poor measure of g for all ages (r = .28). Specificity is ample for all age groups.

eliability and correlational highlights

peed of Information Processing is considered to possess high overall reliability (r = .91), with reliability coefficients ranging from .86 to .94 across all the age groups It has low correlations with all other subtests (mean r =.17) in the battery.

f-Gc classification

the Broad stratum definition of abilities, Speed of Information Processing is considered to be a logical measure of both Processing Speed (Gs). In e Narrow stratum of abilities, it is considered to be a probable measure of Mental Comparison Speed (R7) and a logical measure of Rate-of-test-king (R9) (McGrew & Flanagan, 1998, p. 128).

dministrative and interpretive considerations

ne Speed of Information Processing subtest is described on pages 255 to 260 in the *DAS Administration and Scoring Manual* and discussed on ages 70 to 73 in the *DAS Introductory and Technical Handbook.* This is the only DAS subtest that does not utilize a decision point. All children take items in a specific booklet unless they reach an alternative stopping point. Children using Booklets B or C who make two or more uncorrected rors per page on two of the first four scored items, are discontinued on that booklet. Examiners should then drop back to an easier booklet.

s important for both administration and timing that the examiner, and not the child, turns the pages of the booklet. Timing begins when the child had ade a mark in the first row of items and stops when the child makes a mark in the last row. Examiners should encourage the child to respond quickly roughout the subtest.

n this subtest, Items are actually entire pages that contain either 5 or 8 rows of target figures or numbers. Scoring the subtest requires evaluating not nly the correctness of the entire page (3 or more uncorrected responses is scores as 0) but also the speed in which the child performs the task.

ncorrected errors are incorrect row responses or a skipped row not corrected within the time limit. The Total raw score is the sum of 6 scores on the ored items.

he examiner checks each page before administering the next. This checking should be done fairly ostentatiously with comments to the child as plained on p. 257 of the Manual. Otherwise, the child may learn to rush without concern for accuracy.

ecause this subtest is intended to measure the speed of accurate information processing, interpreting the results must be done carefully. Although ost children will make very few errors, when a child does have numerous errors throughout the subtest, the subtest is probably not tapping what is tended. In this case, the subtest, and any resulting score, should be disregarded.

Recall of Objects | Recall of Digits | Recognition of Pictures

Speed of Information Processing | Matching Letter-Like Forms

Back to DAS Subtest Page

Recognition of Pictures

ormed for ages 2:6 to 17:11 (Usual age range is 3:0 to 7:11; Out of level age ranges are 2:6 to 2:11 and 8:0 to 17:11).

nis subtest assesses short-term visual recognition in contrast to visual recall on the Recall of Designs subtest. The child is shown a picture of one or ore objects for 5 to 10 seconds and then, when shown a page with the same as well as other distracter pictures, is asked to recognize (by pointing) e objects shown originally. The examiner does not name the objects. Success on this task typically involves the ability to recognize and remember sual images, some of which include discriminating among various details.

he subtest contains a total of 20 items, each scored as 1 or 0. Two starting points are available (age 2:6 to 4:11 start at item 1 while 5:0 to 17:11 start item 5). Items 1 through 15 are exposed for 5 seconds, while items 16 to 20 have a 10-second exposure time.

actor analytic findings

he Recognition of Pictures subtest is considered a fair measure of g for ages 2:6 to 3:5 (r = .52) and a poor measure of g for all remaining subtests nean r = 45). Specificity is ample for all age groups 2:6 to 17:11.

eliability and correlational highlights

ecognition of Pictures is considered to possess low overall reliability (r = .72), with reliability coefficients ranging from .00 to .80 across all of the age oups It has low correlations with all other subtests (mean r =.28) in the battery.

f-Gc classification

the Broad stratum definition of abilities, Recognition of Pictures is considered to be a logical measure of both Visual Processing (Gv). In the Narrow ratum of abilities, it is considered to be a probable measure of Visual Memory (MV) (McGrew & Flanagan, 1998, p. 116).

dministrative and interpretive considerations

he Recognition of Pictures subtest is described on pages 251 to 254 in the *DAS Administration and Scoring Manual* and discussed on page 69 in the *AS Introductory and Technical Handbook* Rather than trying to time each exposure period by starting and stopping the stopwatch, simply keep the atch running and gauge the 5 or 10 second interval with the running time.

or any item on which the child points to a single item but not all of the target figures, examiners should ask the child if there are any more. This query ay be done only once per item.

nly the Preschool record form contains a scoring key for this subtest. The key is presented in two ways: how the examiner sees the card and how e child sees the card. Examiners should practice scoring this subtest several times to get acquainted with this scoring key.

nildren sometimes fail to anticipate the increasing difficulty of items and miss one or two before they realize that they must study the pictures more arefully. It is noteworthy if a child continues not to use the full exposure time even after failing an item.

Recall of Objects Recall of Digits Recognition of Pictures

Speed of Information Processing Matching Letter-Like Forms

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Basic Number Skills

ormed for ages 6:0 to 17:11. Percentile ranks are also provided for each half of each grade from the second half of kindergarten through the second alf of grade 12.

asic Number Skills is described on pages 261 to 266 in the *DAS Administration and Scoring Manual* and discussed on pages 74-76 in the *DAS troductory and Technical Handbook.* The DAS Basic Number Skills achievement test requires the child to solve computational problems presented a workbook of problems. It taps concepts and skills that underlie competence in arithmetical reasoning and calculations. The 48 items are arranged imarily in the order of their difficulty although consideration for placement was also given to the sequence in which certain skills are taught within a rriculum. The items cover recognition of printed numbers, understanding of the four arithmetical operations (adding, subtracting, multiplying, and viding), and calculations using whole numbers, decimal fractions, common fractions, and percentages.

asic Number Skills utilizes a Basal and Ceiling format for testing (Basal: 5 or fewer passes within an 8-item set; Ceiling: 3 or fewer passes within the item set).

though it is useful to be able to compare ability and achievement tests that were normed simultaneously on the same students, and the DAS Manual ovides achievement scores predicted from the GCA and Special Nonverbal Composite (pp. 413-414), there are very few math applications oblems, so the examiner will then be faced with the problem of finding a math applications achievement test, which will not be normed on the same ildren as the DAS Basic Number Skills subtest.

Basic Number Skills | Spelling | Word Reading

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Spelling

ormed for ages 6:0 to 17:11. Percentile ranks are also provided for each half of each grade from the second half of kindergarten through the second alf of grade 12.

he Spelling subtest is described on pages 267 to 27 in the *DAS Administration and Scoring Manual* and discussed on pages 77-78 in the *DAS troductory and Technical Handbook.* Spelling requires the child to write words that are dictated by the examiner. The 70-item test is divided into ten item blocks. Like the Basic Number Skills subtest, Spelling utilizes a Basal and Ceiling format for testing (Basal: 5 or fewer passes within a 7-item t; Ceiling: 2 or fewer passes within the 7-item set). To establish the basal and ceiling, examiners administer the first two words in the specified arting block (determined by the child's age). If the child passes both items, the examiner skips to the next block and continues administering the first o items until the child fails one or both items. At that point, the examiner would administer all the items in the previous block. If the child fails both ms on the first attempted block, move back to the preceding block and administer the first two items. Continue to move back until the child passes e first two items in the block and then administer all the remaining items in that block.

ven though Basal and Ceiling rules are used to select items, ability scores are based only on the number of correct responses within a continuous t of completed blocks. The examiner does not give credit for items below the basal. When calculating raw score, ignore all scored items below the asal or above the ceiling. The *DAS Administration and Scoring Manual* provides excellent descriptions of performance analysis for this test. Again, e examiner must seek another test to measure aspects of written expression other than spelling.

Basic Number Skills Spelling Word Reading

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Word Reading

ormed for ages 5:0 to 17:11 (Usual age range 6:0 to 17:11, Out of level age range 5:0 to 5:11). Percentile ranks are also provided for each half of ach grade from the second half of kindergarten through the second half of grade 12.

he Word Reading subtest is described on pages 276-278 in the *DAS Administration and Scoring Manual* and discussed on pages 79-80 in the *DAS troductory and Technical Handbook.* The Word Reading subtest requires the child to read aloud a series of increasingly difficult single-words. The btest contains 90 words separated into nine blocks of 10-words each. Four different age determined starting points are provided. Children read each ccessive block of words until the ceiling of 8 failures in a block of 10 words is reached. Examiners should record the child's attempts phonetically for ter analysis, as described on p. 278 of the Manual. Word Reading, as its name implies, measures only that one aspect of reading. Examiners will eed to find other tests to measure other reading skills.

Basic Number Skills | Spelling | Word Reading

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Differential Ability Scales (DAS)

DAS INTERPRETIVE GUIDELINES

his section addresses an example of how to interpret the DAS following a step-by-step interpretive method.

gid adherence to a g theory of intelligence would focus attention exclusively on the GCA score of the DAS. The most extreme application of the rious separate-factor theories of intelligence (s) might lead interpreters of the DAS to examine the 6 subtests, or even items within those subtests, r evidence of specific abilities. One difficulty with such a fine analysis is that reducing the number of items diminishes reliability. The GCA is more liable than the verbal, nonverbal reasoning, or spatial cluster scores. Almost any group of subtests is more reliable than a single subtest.

n intermediate approach may be the wisest. Much as Elliott (1990) and others recommend, it makes sense to attack a DAS profile hierarchically, ginning with the most reliable groupings of subtests and working through successively less reliable, smaller groupings before reluctantly finishing, a last resort, with the least reliable data: individual subtests. If the evaluator adheres to a g theory, that analysis would be considered an vestigation of deviations from the student's overall intellectual ability. An s orientation would consider the process one of separating the student's vels of intellectual abilities in various factors or "intelligences."

each of the three clusters is coherent – tightly clustered within itself and separate from other factors – the three factors would be the most asonable level of interpretation of that student's DAS. That is, if the subtest scores within the Verbal, Nonverbal Reasoning, and Spatial Clusters are ch tightly grouped, and the clusters scores differ significantly and uncommonly from one another, then it makes sense to consider the verbal, onverbal, and spatial domains separately: the student appears to demonstrate significantly different levels of ability when dealing with verbal, onverbal, and spatial tasks.

ometimes, however, we need to look further. One or more of the three clusters may not be coherent and may require additional subdivision. If there notable scatter within one or more of the Clusters, the next level of interpretation might be the narrow ability interpretation, which separate cognitive ocesses into more specific abilities. This is <u>not</u> an excuse to leap ahead to analysis of individual subtests. It is, instead, a signal to cautiously nsider other groupings of subtest scores.

hat this approach and many others share in common is the idea that, especially for learning disabled students, it is not reasonable to accept the ull Scale" GCA (BCA, IQ, GCI, MPC, SAS, etc.) as the only measure of a student's intellectual ability. Instead, interpretation must take into account rengths and weaknesses, and must recognize the fact that a specific learning disability can affect intelligence test scores as well as other measures ability and achievement. The analysis is preferable to abandoning the intellectual assessment altogether (e.g., Siegel, 1989). The following ustration is intended to demonstrate this argument. It is absolutely not intended to suggest that this is the only way to carry out the necessary alysis.

e interpretive steps outlined and recommended below (Table XXX-23) involve a complete and thorough analysis of all the DAS data and results. e interpreter must evaluate the DAS results utilizing a practical as well as statistical approach. After the interpreter has completed all the steps cessary for making logical decisions, hypotheses can be generated from the results.

ost interpretive schemes (e.g., Kaufman, 1994; Sattler, 1992) begin with the most general aspects (global scores) and progress to more detailed pects of the individual's performance (factors or clusters, subtest variability, qualitative responses). These procedures allow for both a quantitative d qualitative interpretation of the test, which may lead to an understanding of how the person obtained the results and performed the tasks esented by the test (Kaplan, 1988). As one moves through the successive steps presented here, readers are encouraged to consult the cluster and btest information included earlier in the chapter. That section may provide relevant information about the DAS subtests as well as possible erpretive hypotheses and various strategies for expanding understanding of the person's underlying processes.

e approach to test interpretation that is offered here is based upon a statistical and actuarial approach that leads into hypothesis generation. ithout this statistical approach, any interpretation would be less valid and reliable, and would be more likely to be inaccurate. By developing erpretive hypotheses that are based upon a statistical and actuarial analysis of the data and then coupling these findings with clinical observation, aluators are able to make statements about a child's abilities relative to others of the same age as well as make statements based on the child's vn performance. As hypotheses are generated., they are checked by testing them against the child's test performance and behaviors found on this d other tests as well as other sources of information, such as interviews, historical data, and classroom observations.

hen interpreting any test, it is important to remember that the most valid interpretations are based upon the most reliable aspects of the test. erpretation should focus on the most general areas before moving to the less general areas. In the case of the DAS, the most general and most liable areas are the General Conceptual Ability (GCA), and then the Verbal, Nonverbal Reasoning, and the Spatial cluster scores. Below these easures are the Shared Ability factors, and finally the individual subtests.

Table-23

Successive steps in the interpretation of the DAS

Step One: **Evaluate the GCA**

Step Two: Evaluate GCA-Cluster Differences

- Identify any significant differences between the DAS GCA and each Cluster (Verbal, Nonverbal Reasoning, and Spatial)
- Identify the frequency of any observed significant differences

If there are differences that are significant and unusual, interpret Clusters rather than the GCA

Step Three: Evaluate Between-Cluster Differences

- Identify any significant differences between DAS Clusters (Verbal vs. Nonverbal Reasoning vs. Spatial)
- Identify the base-rate frequency of any observed significant differences

If there are differences that are significant and unusual, interpret Clusters rather than the GCA

Step Four: Evaluate Within-Cluster Differences

- Identify any significant Within-Cluster differences
- Identify the base-rate frequency of any observed significant differences

If there are differences that are significant and unusual, interpret narrow abilities rather than the Cluster

Step Five: Narrow Ability Hypotheses

- Identify the narrow abilities assessed and any relevant differences between them

Step Six: Evaluate Shared Ability Hypothesis

- Identify any relevant shared ability groupings

Step Seven: Evaluate Subtest Variability (Core and Diagnostic subtests)

- Identify any significant subtest differences from the Mean Core T Score

- Identify the base-rate frequency of any observed significant differences

Step Eight: Evaluate Qualitative Responses

he DAS provides the examiner many opportunities to observe meaningful, clinical behaviors. Examiners should generate and test hypotheses based ot only upon the resulting scores but also on these relevant behaviors.

nce each successive step of a DAS interpretation requires examiners to judge the adequacy of certain scores, an analysis (without any hypotheses enerated) should first be completed. The DAS Summary Page contains information to aid examiners with this task (critical significance values, Mean ore T score, etc). Examiners may also find the DAS Analysis Sheet (Exhibit-4) useful when beginning any interpretation of a DAS protocol. A mpleted DAS Analysis Sheet summarizes the statistical results that can then be used in each of the successive steps.

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Step-by-step analysis

Differential Ability Scales (DAS)

DAS™

efore administering any test in a "real" evaluation situation, examiners should practice administration and scoring. The best way to start becoming miliar with a new test, even one for young children, is to have someone administer the test to you. The next step is to administer it to a doll or teddy ear before practicing on cooperative friends, family, and neighbors. Someone with expert knowledge of the test should observe you or a videotape of ur administration. Once genuinely proficient, the examiner would still be wise at first to administer the new test in tandem with a familiar instrument sessing similar abilities until the examiner is sure of the quirks and properties of the new test. Given the newness of the DAS and the differences etween the DAS and other traditional cognitive assessment batteries in its scoring, starting and stopping rules, ability score conversions, etc., it is rongly recommended that examiners practice the administration of the test. Samples of checklists that may aid examiners when first learning to use e DAS are below. To download a copy see the bottom of the page..

Administration Checklists for the Differential Ability Scales (DAS) Preschool Subtests

ame of examiner: Date:

Circle One

erbal Comprehension

Starts at appropriate age entry point	***Yes***	***No***	
Repeats items only once if asked	***Yes***	***No***	***NA***
Reads directions verbatim but naturally	***Yes***	***No***	
Makes sure child is paying attention	***Yes***	***No***	
Holds out hand for instructions that include "Give me . . ."	***Yes***	***No***	
Lines up toys but does not name them	***Yes***	***No***	***NA***
Has child demonstrate knowledge of colors and shapes	***Yes***	***No***	***NA***
Makes correct discontinuation decision	***Yes***	***No***	

OMMENTS:

o obtain a copy of the checklists use the link below:

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Differential Ability Scales (DAS)

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Exhibit-4

DAS ANALYSIS SHEET

1. OBTAINED GCA AND COMPOSITE DESCRIPTIONS:

	Score	.95 confidence	Classifications	PR
GCA:				
VERBAL (V):				
NONVERBAL REASONING (NvR):				
SPATIAL (SP):				

2. CONSIDERATIONS OF GCA vs. CLUSTER DIFFERENCES *(9 points for significance)*

*If any comparison is found to be significant **and** abnormal (10% or less) consider the GCA an inadequate summary of abilities.*

GCA vs	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
VERBAL:		Y / N	Y / N	in ____ % of the population.
NONVERBAL REASONING:		Y / N	Y / N	in ___ % of the population.
SPATIAL:		Y / N	Y / N	in ___ % of the population.

3. DETERMINING BETWEEN-CLUSTER DIFFERENCES *(16 points for significance)*

*If any Cluster comparison is found to be significant **and** abnormal (10% or less) consider the GCA an inadequate summary of abilities.*

Cluster vs. Cluster	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
V vs. NvR :		Y / N	Y / N	in ____ % of the population.
V vs. SP:		Y / N	Y / N	in ____ % of the population.

NvR vs. SP:		Y / N	Y / N	in ____ % of the population.

4. DETERMINING WITHIN-CLUSTER DIFFERENCES *(varying point for significance)*

If any comparison is found to be significant ***and*** *abnormal (10% or less) consider the Cluster an inadequate summary of abilities.*

	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
WDef vs. Sim (*12 pts*) :		Y / N	Y / N	in ____ % of the population.
Mat vs. SQR (*11 pts*) :		Y / N	Y / N	in ___ % of the population.
RDes vs. PCon (*10 pts*) :		Y / N	Y / N	in ____ % of the population.

5. SUBTEST ANALYSIS

MEAN CORE T SCORE:	T Score	Value	Difference from Mean Core T	High/ Low (H / L)
Word Definitions (WDef) :		10		
Similarities (Sim) :		11		
Matrices (Mat) :		11		
Seq. & Quant. Reasoning (SQR) :		10		
Recall of Designs (RDes) :		10		
Pattern Construction (PCon) :		8		
Recall of Digits (RDig) :		11		
Recall of Objects - Immed. (RObj-I) :		14		
Speed of Infor. Process. (SIP) :		9		
Recall of Objects - Delay (RObj-D) :		14		
(RObj-I) vs (RObj-D) :		14		No Significant difference
Recall of Digits vs. Objects:		12		Digits / Objects Higher

DETERMINATION OF PROBABLE AND POSSIBLE DAS SHARED ABILITIES

Shared Ability		***Shared Ability Subtests (includes out-of-level subtests)***				
Nonverbal Problem Solving:		Mat	SQR	PCon	PSim	
	H / L **or** + / -					
Verbal Conceptualization:		WDef	Sim	VComp	NVoc	
	H / L **or** + / -					
Formulation and Testing of Hypotheses:		Sim	Mat	SQR	PCon	PSim
	H / L **or** + / -					
Spatial Visualization and Orientation:		RDes	PCon	Copy	Enc	MLLF

H / L **or** + / -								
Visual Discrimination of Figures or designs:	Mat	SQR	RDes	RPic	PSim	Copy	MLLF	
H / L **or** + / -								
Verbal Comprehension:	WDef	Sim	VComp	Enc				
H / L **or** + / -								
Verbal Expression:	WDef	Sim	RDig	RObj	NVoc	Enc		
H / L **or** + / -								
Verbal Information Retrieval (Long term memory):	WDef	Sim	NVoc	Enc				
H / L **or** + / -								
Knowledge of Quantitative Concepts:	SQR (b)	SIP						
H / L **or** + / -								
Short term memory (general):	RDes	RDig	RObj	RPic				
H / L **or** + / -								
Visual short-term memory:	RDes	RObj	RPic					
H / L **or** + / -								
Verbal short-term memory:	RDig	SIP						
H / L **or** + / -								
Speed of information processing:	PCon	SIP						
H / L **or** + / -								
Visual/holistic information processing:	Mat	RDes	PCon	RObj	RPic	PSim	Copy	MLLF
H / L **or** + / -								
Verbal/sequential information processing:	WDef	Sim	SQR	RDig	SIP	VComp	NVoc	Enc
H / L **or** + / -								

Def = Word Definitions, Sim = Similarities, Mat = Matrices, SQR = Sequential & Quantitative Reasoning, RDes = Recall of Designs, PCon = Pattern Construction, VComp = Verbal mprehension, NVoc = Naming Vocabulary, PSim = Picture Similarities, Copy = Copying, ENC = Early Number Concepts, MLLF = Matching Letter-Like Forms, RDig = Recall of gits, RObj = Recall of Objects, SIP = Speed of Information Processing, RPic = Recognition of Pictures

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To download a copy of the DAS ANALYSIS SHEET press this link

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Differential Ability Scales (DAS)

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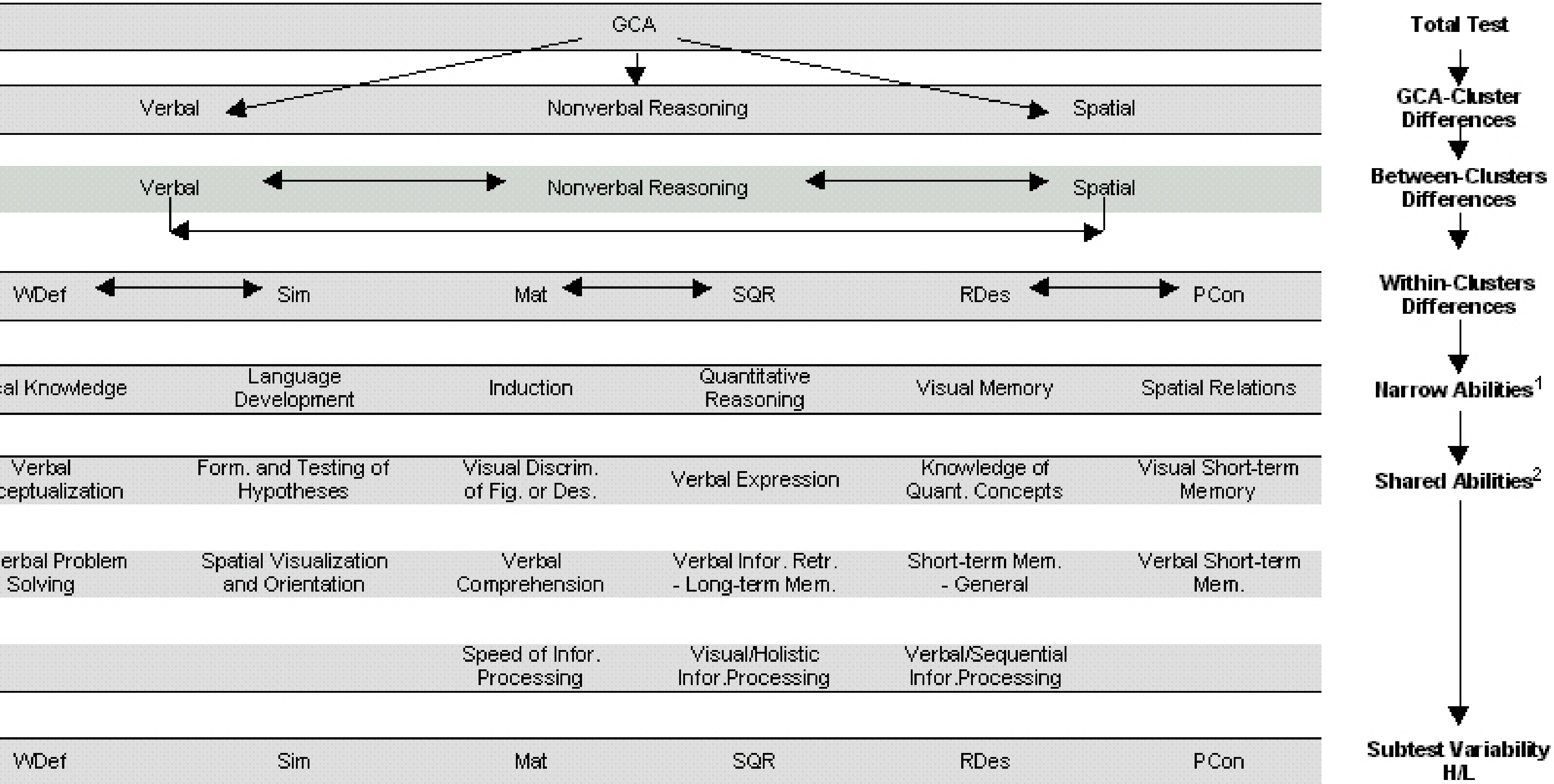
Step-by-step Analysis

s of DAS interpretation



w abilities are those reported in Kevin McGrew & Dawn Flanagan's The Intelligence Test Desk Reference (ITDR):Gf-Gc Cross-Battery Assessment (Allyn & Bacon, 1998)

d abilities are those provided by Elliott (1990): Nonverbal Problem Solving (Mat, SQR, PCon, PSim); Verbal Conceptualization (WDef, Sim, VComp, NVoc); Formulation and of Hypotheses (Sim, Mat, SQR, PCon, PSim); Spatial Visualization and Orientation (RDes, PCon, Copy, Enc, MLLF); Visual Discrimination of Figures or Designs (Mat, Des, RPic, PSim, Copy, MLLF); Verbal Comprehension (WDef, Sim, VComp, Enc); Verbal Expression (WDef, Sim, RDig, RObj, NVoc, Enc); Verbal Information Retrieval - rm Memory (WDef, Sim, NVoc, Enc); Knowledge of Quantitative Concepts (SQR (b), SIP); Short-term Memory - general (RDes, RDig, RObj, RPic); Visual Short-term (RDes, RObj, RPic);Verbal Short-term Memory (RDig, SIP); Speed of Information Processing (PCon, SIP); Visual/holistic Information Processing (Mat, RDes, PCon, RObj, Sim, Copy, MLLF); Verbal/Sequential Information Processing (WDef, Sim, SQR, RDig, SIP, VComp, NVoc, Enc).

ne: Evaluate the GCA

neral Conceptual Ability score is the most reliable and valid score usually obtained on the DAS. It is considered to be an excellent measure of general ve ability (*g*) as well as being the best predictor of overall academic achievement for both children with disabilities and children without disabilities strom, Kogos, & Glutting, 1999).

eters must determine whether the GCA score represents the best summary of overall intellectual ability. Does the GCA represent a clinically meaningful e of the individual's abilities or would reporting and interpreting the various constructs of the DAS provide a more useful explanation of abilities? If the of "scatter" within and between the clusters that make up the GCA is insignificant and not unusual compared to the scatter seen in the DAS norming , then the GCA score probably summarizes most of the useful information about the student available from that administration of the DAS. If, however, e cluster scores that combine to create the overall GCA score deviate significantly and unusually from the GCA, more interpretation seems warranted.

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Step Two

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Differential Ability Scales (DAS)

DAS™

Step-by-step Analysis

ep Two: Evaluate GCA-Cluster Differences

- Identify any significant differences between the DAS GCA and each cluster (Verbal, Nonverbal Reasoning, and Spatial)

etermining whether the GCA is an accurate overall representation of the person's abilities requires that the examiner determine how discrepant each uster (Verbal, Nonverbal Reasoning, and Spatial) is from the GCA itself. The DAS provides examiners easy access to the discrepancy requirement r each comparison. The DAS *Introductory and Technical Handbook* Table B.1. and Table B.4. (pp. 290-292) show the difference required for atistical significance at three levels (.15, .05, and .01) for the entire age appropriate samples (Preschool and School-Age) as well as significance at ach of 16 age categories. Rounded mean values at the .05 significance level are also found on the protocol Summary Page. For School-Age ildren, the mean value for each of the three comparisons is approximately 9 points, while for Upper Preschool children, the Verbal and Nonverbal ean values are 9 and 8 respectively.

- Identify the frequency of any observed significant differences

discrepancies do exist between the cluster scores and the GCA, examiners must determine the frequency of such occurrences. Significant screpancies, although important in developing hypotheses about a child's performance, are often found with surprisingly high frequency in samples children. It should be noted that the GCA-Cluster comparisons for the DAS standardization sample typically demonstrated that, if one disregards the rection of the differences, approximately 25% of the population is expected to display at least one significant GCA-Cluster discrepancy. For example, though School-Age children on average require a 9-point difference between the GCA and any one of the cluster scores, a 9-point difference is pected to occur in over 25% of the cases [See DAS *Introductory and Technical Handbook* Table B.2. and Table B.3. (p. 291). All the percentages in ese two tables reflect those children from the standardization sample having a difference in either direction]. Although the DAS *Introductory and echnical Handbook* does not provide frequency data for specific direction of difference (e.g., GCA>V vs. GCA < V), one can estimate such fferences by halving the size of the percentage shown in these tables. For example, Table B.3. indicates that a child obtaining a difference of 15 oints between the GCA and the Verbal ability score would be similar to about 10% of the standardization sample. If examiners were interested in only CA > Verbal Ability, a difference of 15 points might be expected in approximately 5% of the population.

- If there is at least one difference that is significant and unusual, interpret clusters rather than the GCA.

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Step Three

Differential Ability Scales (DAS)

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Step-by-step Analysis

ep Three: Evaluate Between-Cluster Differences

- Identify any significant differences between DAS clusters

there are significant and unusual differences between any pair of cluster scores , the GCA must be interpreted with caution. As with almost any gnitive test that assesses multiple cognitive abilities, differences among the abilities can often lead to important interpretive hypotheses. Between-uster differences can occur for a number of different reasons, including learning disabilities, different interests, strengths/difficulties working under ne pressures, strengths/deficits in information processing, sensory impairments, cognitive styles, or brain injury. Neither the presence nor absence of etween-Cluster differences is by itself sufficient to diagnose or rule out any disability.

ne DAS *Introductory and Technical Handbook* Table B.1. and Table B.4. (pp. 290-292) provides the examiner with information about the difference quired for statistical significance for these Between-Cluster comparisons. Rounded mean values at the .05 significance level are also found on the otocol Summary Page. For School-Age children, the mean values for each of the three comparisons is approximately 16 points, while for Preschool ildren the Verbal/Nonverbal mean value is 14 points.

hen each of the V/NVR/Sp comparison differences is less than the critical values for significance, the GCA is most likely a reliable total. If there is no mpelling reason to bypass the statistical approach to interpretation (e.g., significant scatter between the scores that make up the clusters; the fects of retesting), one may infer that the person displays fairly equal abilities whether through verbal expression of concepts, knowledge, and asoning; through complex nonverbal inductive reasoning; or through complex visual-spatial processing.

- Identify the frequency of any observed significant differences

s noted above, a statistically significant difference between certain cognitive abilities is often found frequently in the general population of children. If DAS Cluster differs significantly from any other Cluster on the test, examiners must determine the base-rate frequency of the observed difference. ne Between-Cluster differences shown by various percentages of the standardization sample are found in Tables B.4. and B.5. in the DAS troductory and Technical Handbook*. In general, Preschool Verbal and Nonverbal Clusters would need to differ by approximately 25 points in order to pproach a level seen in only 10% of the population. For the School-Age clusters, a difference between clusters must be between 21 and 24 points to e considered unusual. It must again be noted that these tables, in the DAS *Introductory and Technical Handbook*, are derived from the absolute alue of the difference and disregard the nature of the discrepancy (e.g., V > NVR, NVR > V). As before, to estimate the frequency of a particular ecific cluster comparison in one direction, halve the size of the percentage shown in these tables.

there are differences that are significant and unusual, interpret subtests rather than their cluster

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Step Four

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Differential Ability Scales (DAS)

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Step-by-step Analysis

ep Four: Evaluate Within-Cluster Differences

- Identify any significant within-cluster differences

ecause the clusters of the DAS assess not only aspects of total cognitive ability, but also separate cognitive skills, it is important to judge whether the usters themselves are unitary - are the clusters, composed of two subtests - valid measures of the abilities being assessed? Since broad cognitive ills, such as verbal ability, can be measured in numerous ways, it should not surprise examiners that subtests within factors or clusters do often eviate from each other. The DAS Clusters are composed of 2 subtests on the School-Age level, and 2 or 3 subtests on the Preschool level. On each vel, the clusters utilize subtests that measure the same broad construct (e.g., Verbal ability) but do so with tasks that are different in their specific sk demands. Each subtest can be delineated by one or more "narrow" abilities. These narrow abilities, as defined by Flanagan, McGrew, and Ortiz 000) and McGrew and Flanagan (1998), assist in the interpretation of the DAS clusters.

o determine the validity of a cluster, examiners must first determine whether the subtests in that cluster differ statistically from one another. As noted bove, both the DAS *Introductory and Technical Handbook* [Table B.1. and Table B.4. (Pp. 290-292)] and the DAS Summary page of the record form clude information regarding statistical discrepancy. The values from these sources indicate that, for the Preschool subtests included in the clusters, a fference of 12 and 14 points between the subtests may be considered significant. For the subtests in the School-Age clusters, a difference of 10 to points is needed.

he clusters appear to be unitary, interpret those clusters as representing broad measures of the separate abilities (e.g., Verbal, Nonverbal easoning, Spatial).

- Identify the frequency of any observed significant differences

s with all other comparisons, the base-rate frequency of any obtained within-cluster difference is evaluated for unusualness. In the case of the DAS eschool subtest comparisons, to reach a level of unusualness, defined as equal to or less than 10% of the sample, a difference of approximately 18 oints is need for all comparisons except Verbal Comprehension vs. Naming Vocabulary, where a difference of 13 points is needed. For the School-ge clusters, differences of between 13 and 15 points are necessary.

- If there are differences that are significant and unusual, interpret narrow abilities rather than the cluster

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Step Five

Differential Ability Scales (DAS)

DAS™

Step-by-step Analysis

ep Five: Narrow Ability Hypotheses

- Identify the narrow abilities assessed and any relevant differences between them

s seen from the previous discussion, despite the fact that the subtests within each of the DAS clusters measure the same broad ability, one should t be surprised to find within-cluster differences. When interpreting clusters found to have divergent subtests, examiners may generate hypotheses levant to the subtests themselves. Knowing that Word Definitions and Similarities are both measures of Verbal ability on the School-Age DAS and so knowing that the first measures that ability through the use of Lexical Knowledge while the second measures it through Language Development ovides plausible explanations for differing scores. Flanagan, McGrew, and Ortiz (2000) and McGrew and Flanagan (1998) provide descriptions of ch broad and narrow ability for the major cognitive assessment batteries, including the DAS.

Table XXX-24

DAS Subtests and Proposed Narrow Abilities

Verbal Subtests		Narrow Abilities
Verbal Comprehension		Language Development
Naming Vocabulary		Lexical Knowledge
Word Definitions		Lexical Knowledge
Similarities		Language Development

Nonverbal/Spatial Subtests	
Block Building	Visualization
Picture Similarities	Induction
Copying	Visual Memory
Recall of Designs	Visual Memory
Pattern Construction	Spatial Relations
Nonverbal (Fluid Reasoning) Subtests	
Matrices	Induction
Sequential and Quantitative Reasoning	Quantitative Reasoning
Early Number Concepts	
Early Number Concepts	Math Achievement
Diagnostic Subtests	
Matching Letter-Like Forms	Visualization
Recall of Digits	Memory Span
Recognition of Pictures	Visual memory
Recall of Objects-Immediate	Visual memory
Speed of Information Processing	Mental Computational Speed

Adapted from Appendix A, pp. 445 – 453, The Intelligence Test Desk Reference (ITDR): Gf-Gc Cross-Battery Assessment (McGrew & Flanagan, 1998).

Shaded subtests are those typically administered in the School-Age Battery

dditional data may be necessary to reach a meaningful and trustworthy interpretation. When a significant and unusual difference between subtests ads you to interpret narrow abilities rather than the broad ability represented by the cluster as a whole, you are attempting to interpret relatively nreliable, individual subtests. You will probably need to use other tests of the same abilities to more fully understand the student's strengths and eaknesses within the broad ability. Detailed descriptions of abilities measured by other major intelligence test batteries (e.g., WISC-III and SB:FE) sewhere in this web site and the tables in Flanagan, McGrew, and Ortiz (2000), Flanagan and Ortiz (2000), and McGrew and Flanagan (1998) allow e examiner to select additional tests to complete the measurement of unusually scattered narrow abilities within a broad ability classification.

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Step Six

Differential Ability Scales (DAS)

DAS ™

Step-by-step Analysis

ep Six: Evaluate Shared Ability Hypotheses

- Identify any relevant shared ability groupings

liott (1990, p. 100) in his description of the systematic interpretation of the DAS, provides what he called "Shared underlying processes" related to e DAS subtests. He has grouped together, and labeled as "shared abilities," sets of two or more subtests that appear to be assessing common pacities. The labels used for these sets of subtests are "suggestive" of the underlying processes. They are not meant to be definitive. They provide nother avenue to pursue when generating hypotheses about a child performance. Shared ability groupings are based on the assumption that a child ho performs poorly on a particular subtest will be weak in some, but probably not all, of the aspects of abilities measured by that subtest. Conversely, e child who performs very well on a subtest is not necessarily expected to perform well on all aspects of that subtest might assess.

o examine shared abilities examiners must first determine how each subtest compares to the student's overall mean for the test -- whether the btest falls at, above (+), or below (-) the mean of the test. Subtests falling either above or below the mean are also examined to determine if they e falling statistically higher or lower than what would be expected. [We have chosen to use the terms High (H) or Low (L) rather than the more aditional Strength (S) or Weakness (W). We do this to make clear that all analysis is done relative to the child and to emphasize that a subtest that oes in fact deviate from the mean of the test may be "below the child's mean" but still within the average range of scores. It is not appropriate to use e term "weakness" for a score that is average or higher by the test norms, nor the term "strength" for a score that is below the average range. Using e less value-laden terms of High and Low may prevent misinterpretation of the DAS results.] Figure-4 shows a portion of the *DAS Analysis Sheet* at represents the shared ability groupings. Examiners begin the evaluation of each shared ability grouping by entering either a + (higher), - (lower), (significantly higher), or L (significantly lower) into the box below each subtest that differs from the student's own Mean Core T score. The box would e blank if the score were identical to the child's own Mean Core T score. These represent the relative standing for each of the DAS subtests when mpared to the child's overall mean on the test (Mean Core T score). Examiners then assess each grouping, noting especially those that contain btests that are considered High (H) or Low (L). By noting whether the subtests within the groupings are consistent - all above the mean or all below e mean - examiners can hypothesize possible strengths or weaknesses within the specific abilities. A shared ability with all subtests above the mean d additionally at least one subtest rated as H would be considered a "Probable strength," while one with subtests all rated as "above the mean" but thout any subtest being rated as H would be considered a "Possible strength." In the example below, the Verbal Information Retrieval (long-term emory) shared ability would not be considered a potential strength or weakness because neither of the subtests given (WDef and Sim) was rated as or L and additionally, one was above the mean (+) while the other was below the mean (-). The Knowledge of Quantitative Concepts shared ability ould be hypothesized as a "probable weakness" since both of the subtests that make up the ability are rated as L.

Figure -4 Shared Ability groupings (completed example)

Verbal Information Retrieval (Long term memory):		WDef	Sim	NVoc	ENC
	H / L **or** + / -	-	+		
Knowledge of Quantitative Concepts:		SQR (b)	SIP		
	H / L **or** + / -	L	L		
Short term memory (general):		RDes	RDig	RObj	RPic
	H / L **or** + / -	H	L	+	
Visual short-term memory:		RDes	RObj	RPic	
	H / L **or** + / -	H	+		

Def = Word Definitions, Sim = Similarities, NVoc = Naming Vocabulary, ENC = Early Number Concepts, SQR = Sequential & Quantitative Reasoning, RDes = Recall of Designs, Dig = Recall of Digits, RObj = Recall of Objects, SIP = Speed of Information Processing, RPic = Recognition of Pictures

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Step Seven

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Differential Ability Scales (DAS)

DAS™

Step-by-step Analysis

ep Seven: Evaluate Subtest Variability (Core and Diagnostic subtests)

- Identify any significant subtest variation from the Mean Core T Score

test battery such as the DAS provides a picture of an individual's cognitive strength and weaknesses. This type of evaluation is considered *ipsative* - thin the individual. As such, when evaluating the test profile, the relative level of a subtest score, rather than the absolute level, is of great portance.

though subtest scores are related, they differ in item content and test administration and thus these differences cause the subtest scores to vary. In atistical terms, each subtest carries with it some components of shared common variance, while most have some proportion of specific, reliable riance as well as finally components of error variance. Subtests can, and do, differ from each other. Before one can evaluate the differences tween what appear to be high or low subtest scores, one must evaluate whether these apparent differences are large enough to warrant terpretation. To do so we must know if the difference is large, reliable, and significant.

etermining an individual subtest's strength or weakness requires that one examine how discrepant is each subtest from the full test mean. The DAS s provided the examiner easy access to both the child's mean for the test (found in the *DAS Manua*l, in Tables 3 and 4) and the discrepancy quirement for each subtest (on the protocol summary page, in the *DAS Manua*l, Table 12, as well as in the *DAS Handbook*, Table B.5.).

or statistical significance at the .05 level, the Preschool and School-Age core subtests require between 8 to 13 points of difference between the btest T score and the Mean Core T score. Diagnostic subtests vary between 9 and 16 points at the .05 level.

- Identify the frequency of any observed significant differences

ables B.6, B.7 and B.8 in the *DAS Handbook* provide approximate percentages of the norm sample that obtained certain differences between the ean Core T score and the individual subtest scores. Using these tables allows the examiner to determine whether the differences observed reach a vel of unusualness. Overall, for the core subtests, differences of about 11 points on the Preschool battery and 10 points on the School-Age, would e expected to occur in only about 10 percent of the children tested.

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Step Eight

Differential Ability Scales (DAS)

Step-by-step Analysis

ep Eight: Evaluate Qualitative Responses

ne final step in DAS interpretation is the qualitative evaluation of both the responses given and the task requirements of the subtests.

able - 25 shows input/output requirements for each of the DAS subtests. Examiners may wish to examine the demands of a subtest with which a ild has had particular problems and contrast that with the child's performance on another subtest having different demands. For example, a child ay have done well on the Verbal Comprehension subtest and poorly on the Naming Vocabulary subtest. Contrasting the input/output demands of the btests, input for Verbal Comprehension involved both auditory and visual meaningful stimuli while Naming Vocabulary included primarily visual put. Additionally, the mode of output for Verbal Comprehension is motoric while the mode for Naming Vocabulary is verbal. Examiners using this mparative approach could investigate further the hypotheses generated by qualitative analysis. To really understand the demands of each subtest, ve someone administer the subtest to you. Even with preschool tests, there is no substitute for this experience in helping you understand all the emands of a subtest.

Table - 25 Method of Input and Output for DAS Subtests

	Input			Output	
	Auditory	Visual		Verbal	Motor
		Meaningful	Symbolic		
Verbal Subtests					
Verbal Comprehension	v	v			v
Naming Vocabulary		v		v	

Word Definitions	v			v	
Similarities	v			v	
Nonverbal/Spatial Subtests					
Block Building			v		v
Picture Similarities		v	v		v
Copying		v	v		v
Recall of Designs		v	v		v
Pattern Construction			v		v
Nonverbal (Fluid Reasoning) Subtests					
Matrices			v	v	v
Sequential and Quantitative Reasoning		v		v	v
Early Number Concepts					
Early Number Concepts	v	v		v	v
Achievement Subtests					
Basic Number Skills	v	v		v	v
Spelling	v				v
Word Reading		v		v	
Diagnostic Subtests					
Matching Letter-Like Forms			v		v
Recall of Digits	v		v	v	
Recognition of Pictures		v		v	
Recall of Objects-Immediate		v		v	

Recall of Objects-Delayed		v		v	
Speed of Information Processing		v			v

Shaded subtests are those typically administered in the School-Age Battery

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Case Study 1

Differential Ability Scales (DAS)

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Step-by-step Analysis

n Illustrative Case with the DAS

ate, a 14 year old, was referred for evaluation because of difficulty in her 8th grade classes, specifically in the areas related to mathematical concepts d reasoning. Teachers had noted on the *Learning Disabilities Diagnostic Inventory* (LDDI, 1999) that she frequently "Makes borrowing errors," eaches 'unreasonable' answers," and "Has difficulty in multi-step problems."

ate was administered the DAS and obtained the results in T scores, Standard Scores, and Percentile Ranks for her age found in Table - 26.

Table -

Table - 26 KATE'S DAS SCORES AS T SCORES, STANDARD SCORES, AND PERCENTILE RANK FOR HER AGE

Total Scores [letters in ( ) show subtests from below included in each Composite]	Standard Score	Percentile Rank	Classification	95% Confidence[1]
General Conceptual Ability	100	50	Average	91-109
(WDef Sim Mat SQR RDes PCon)				

Verbal	103	58	Average	93-113
(WDef Sim)				
Nonverbal Reasoning	78	07	Low	70-88
(Mat SQR)				
Spatial	116	86	Above Average	107-124
(RDes PCon)				
	T Score	Percentile Rank	Classification	
Verbal Tests				
Words Definitions (WDef)	49	46	Average	
Similarities (Sim)	56	73	Average	
Nonverbal Tests				
Matrices (Mat)	43	24	Average	
Sequential & Quantitative Reasoning (SQR)	32	04	Low	
Spatial Tests				
Recall of Designs (RDes)	60	84	High	
Pattern Construction (PCon)	60	84	High	
Diagnostic Tests				
Recall of Digits (RDig)	30	02	Low	
Recall of Objects - Immediate (ROi)	55	69	Average	
Recall of Objects - Delayed (ROd)	61	86	Above Average	
*Speed of Information Processing (*SIP)	35	07	Low	

1. Even the best tests are not perfectly consistent. Lucky and unlucky guesses or barely beating or missing time limits, for example, will cause scores to vary. The 95% confidence band shows how much scores are likely to vary 95% of the time by pure chance.

WDef = Word Definitions, Sim = Similarities, Mat = Matrices, SQR = Sequential & Quantitative Reasoning, RDes = Recall of Designs, PCon = Pattern Construction, RDig = Recall of Digits, ROi = Recall of Objects-Immediate, ROd = Recall of Objects-Delayed, SIP = Speed of Information Processing

he first step in interpreting Kate's results is an examination strictly from a descriptive point of view - at what level of cognitive ability what did she rform? Analysis at this stage is considered descriptive in nature since no statistical comparisons have yet been made. Kate appears to be nctioning overall in the Average range, with a GCA score of 100 (94-106, 59th percentile, Average). The GCA score comprises her other composite ores, and these scores range from the low Nonverbal Reasoning score of 78 (70-88, 10th percentile, Low) to her high Spatial score of 116 (107-124, st percentile, High). Because of the differences between the scores, a careful analysis of Kate's profile is warranted. Blindly accepting the perfectly verage GCA score would neglect to take into consideration the seemingly diverse nature of Kate's abilities.

amining the subtest T scores also gives some preliminary description about how Kate performed. Her core subtests ranged from a low of 32 (10th rcentile) on the Sequential & Quantitative Reasoning subtest to a high of 60 (84th percentile) on the two Spatial subtests, Recall of Designs and attern Construction. The scores on the diagnostic subtests given to Kate also reveal information from which to generate hypotheses. She did poorly both the Recall of Digits (2nd percentile) and Speed of Information Processing (7th percentile) and yet performed average or above on both the ecall of Objects - Immediate (69th percentile) and - Delayed (86th percentile) subtests. Since Recall of Digits and Recall of Objects both involve some pect of memory, this area will need to be further explored throughout the interpretation.

continue the analysis of Kate's scores, examiners should complete each of the steps outlined in the previous section of this chapter. Completing ese steps allows the hypothesis generation and resulting interpretation to be integrated with all findings instead of continually generating hypotheses one step that might be quickly negated by the next step. For our example, the *DAS Analysis Sheet* (Exhibit-4) was completed.

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Differential Ability Scales (DAS)

Step-by-step Analysis

ep 2 in interpretation is examination of any GCA vs. Cluster differences. Are any of the Cluster scores statistically different from the GCA score and these differences constitute a level of unusualness? The completed *DAS Analysis Sheet* indicates that both the 22-point difference between the CA and the Nonverbal Reasoning scores and the 16-point difference between the GCA and the Spatial score are not only statistically significant but so are only expected to occur in small percentages (1% and 10% respectively) of the population. Because of this, examiners can feel confident that e GCA score itself is not a clear summary of Kate's abilities. While Kate was able to express her knowledge and understanding at an average level r her age through the use of verbal expression, her ability to perform tasks that involve spatial visualization was much better developed while her ility to utilize nonverbal, logical, sequential reasoning seems much less well developed.

gure-5 CONSIDERATIONS OF GCA vs. CLUSTER DIFFERENCES

GCA vs	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
VERBAL:	3	Y / N	Y / N	in ____ % of the population.
NONVERBAL REASONING:	-22	Y / N	Y / N	in __1 _ % of the population.
SPATIAL:	16	Y / N	Y / N	in _10__ % of the population.

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etween-Cluster differences are next examined (Figure-6). Kate was found to have statistically significant and unusual differences between her Verbal d Nonverbal Reasoning scores as well as between her Nonverbal Reasoning and Spatial scores. Both differences are expected to occur in only out 1 to 5% of the population. These large and unusual differences suggest that Kate displays her cognitive abilities in very different ways. erpretation of Kate's abilities will most likely concentrate on these large cognitive cluster differences. These finding support those of Step 1. The CA appears to be an inadequate way to try to describe Kate's abilities.

gure-6 DETERMINING BETWEEN-CLUSTER DIFFERENCES

Cluster vs. Cluster	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
V vs. NvR :	25	Y / N	Y / N	in __5__ % of the population.
V vs. SP:	13	Y / N	Y / N	in ____ % of the population.
NvR vs. SP:	38	Y / N	Y / N	in __1__ % of the population.

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Differential Ability Scales (DAS)

Step-by-step Analysis

efore interpretation can focus on the clusters themselves, Step 4 (Figure-7) must be completed to determine how unified the cluster scores are. If the btests' T scores that create the individual clusters are very different from each other, then the Composite Cluster scores will have little intrinsic eaning, and should not be interpreted as a unitary construct. For Kate, Step 4 indicates that the subtests within the Verbal and within the Spatial usters are close to one another and show no significant differences. However, the subtests in the Nonverbal Reasoning Cluster differ by 11 points d this difference is statistically significant. Base rate suggests that approximately 15% of children obtain a difference of this magnitude.

gure-7 DETERMINING WITHIN-CLUSTER DIFFERENCES

	DIFF.	STATISTICALLY SIGNIFICANT	ABNORMAL	FREQUENCY (Table B.3. p. 291)
WDef vs. Sim (*12 pts*) :	7	Y / N	Y / N	in ____ % of the population.
Mat vs. SQR (*11 pts*) :	11	Y / N	Y / N	in _15__ % of the population.
RDes vs. PCon (*10 pts*) :	0	Y / N	Y / N	in ____ % of the population.

ecause of the significant, though not highly unusual, differences between the Matrices and Sequential & Quantitative Reasoning subtests, the narrow ilities assessed by each subtest should be considered. In this case, Matrices being so much higher than the Sequential & Quantitative Reasoning ay indicate a difference between Kate's abilities in the area of Induction versus Quantitative Reasoning. Induction refers to the ability to discover nderlying rules, concepts, processes, trends, and/or class memberships that governs a particular problem, while Quantitative Reasoning refers to the bility to inductively or deductively reason with concepts involving mathematical relations and properties. Qualitative analysis of Kate's responses on e Sequential & Quantitative Reasoning subtest may provide evidence to explain this difficulty. Were her answers incorrect because of a lack of asoning (not understanding the logical reasoning being the problems), were they incorrect because of an inability to problem-solve when the stimuli volved numerical concepts, or did she simply make computational errors?

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Differential Ability Scales (DAS)

Step-by-step Analysis

sative analysis of Kate's subtests provides further help in understanding Kate's performance on the DAS. Identifying each subtest as being either atistically higher or lower than the mean of the test allows the interpreter to develop hypotheses regarding shared abilities. Each of her subtest ores was compared to the mean of her core subtests. Three of her core subtests differed significantly from the mean (SQR, RDes, and PCon) with QR being lower while RDes and PCon were both significantly above the mean. Additionally, two of her diagnostic subtests (RDig and SIP) were und to be significantly depressed when compared to her overall mean.

gure-8 SUBTEST ANALYSIS

MEAN CORE T SCORE:	50	Critical	Difference from	
	T Score	Value	Mean Core T	High/ Low (H / L)
Word Definitions (WDef) :	49	10	-1	-
Similarities (Sim) :	56	11	6	+
Matrices (Mat) :	43	11	-7	-
Seq. & Quant. Reasoning (SQR) :	32	10	-18	L
Recall of Designs (RDes) :	60	10	10	H
Pattern Construction (PCon) :	60	8	10	H
Recall of Digits (RDig) :	30	11	-20	L
Recall of Objects - Immed. (RObj-I) :	55	14	5	+
Speed of Infor. Process. (SIP) :	35	9	-15	L
Recall of Objects - Delay (RObj-D) :	61	14	11	+

(RObj-I) vs (RObj-D) :	14	6	No Significant difference
Recall of Digits vs. Objects:	12	25	Digits / Objects Higher

he comparisons between the Immediate and the Delayed trials of the Recall of Objects subtest showed no significant difference [Examiners should t interpret these two measures separately unless the difference between them is at least 14 points.], so the interpretation focuses on the Immediate al only. There was a difference noted between the Recall of Digits and the Recall of Objects subtest, with the score on the Objects being 25 points gher than the score on the Digits.

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Differential Ability Scales (DAS)

DAS ™

Step-by-step Analysis

efore an attempt is made to interpret the DAS subtests alone or in isolation, each shared ability is examined to determine if a cluster comprised of a umber of subtests provides more relevant information than would the single subtest (Figure-9). In the case of Kate, the following shared abilities em worthy of examination: Spatial Visualization and Orientation (H, H), Knowledge of Quantitative Concepts (L, L) Visual short-term memory (H, +), d Verbal short-term memory (L, L).

gure-9 Shared Abilities

Shared Ability		***Shared Ability Subtests (includes out-of-level subtests)***						
Nonverbal Problem Solving:		Mat	SQR	PCon	PSim			
	H / L **or** + / -	-	L	H				
Verbal Conceptualization:		WDef	Sim	VComp	NVoc			
	H / L **or** + / -	-	+					
Formulation and Testing of Hypotheses:		Sim	Mat	SQR	PCon	PSim		
	H / L **or** + / -	+	-	L	H			
Spatial Visualization and Orientation:		RDes	PCon	Copy	ENC	MLLF		
	H / L **or** + / -	H	H					
Visual Discrimination of Figures or designs:		Mat	SQR	RDes	RPic	PSim	Copy	MLLF
	H / L **or** + / -	-	L	H				
Verbal Comprehension:		WDef	Sim	VComp	ENC			
	H / L **or** + / -	-	+					

Verbal Expression:	WDef	Sim	RDig	RObj	NVoc	ENC		
H / L **or** + / -	-	+	L	+				
Verbal Information Retrieval (Long term memory):	WDef	Sim	NVoc	ENC				
H / L **or** + / -	-	+						
Knowledge of Quantitative Concepts:	SQR (b)	SIP						
H / L **or** + / -	L	L						
Short term memory (general):	RDes	RDig	RObj	RPic				
H / L **or** + / -	H	L	+					
Visual short-term memory:	RDes	RObj	RPic					
H / L **or** + / -	H	+						
Verbal short-term memory:	RDig	SIP						
H / L **or** + / -	L	L						
Speed of information processing:	PCon	SIP						
H / L **or** + / -	H	L						
Visual/holistic information processing:	Mat	RDes	PCon	RObj	RPic	PSim	Copy	MLLF
H / L **or** + / -	-	H	H	+				
Verbal/sequential information processing:	WDef	Sim	SQR	RDig	SIP	VComp	NVoc	ENC
H / L **or** + / -	-	+	L	L	L			

Def = Word Definitions, Sim = Similarities, Mat = Matrices, SQR = Sequential & Quantitative Reasoning, RDes = Recall of Designs, PCon = Pattern Construction, VComp = Verbal mprehension, NVoc = Naming Vocabulary, PSim = Picture Similarities, Copy = Copying, ENC = Early Number Concepts, MLLF = Matching Letter-Like Forms, RDig = Recall of gits, RObj = Recall of Objects, SIP = Speed of Information Processing, RPic = Recognition of Pictures

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Summary

Differential Ability Scales (DAS)

Step-by-step Analysis

e can summarize the following hypotheses based on the results of the interpretive steps:

- Kate is a child who appears to function in the average range of cognitive ability.
- Because her Nonverbal Reasoning and Spatial abilities differ significantly from her GCA score any interpretation of the GCA must be done cautiously.
- Between the clusters, her Verbal and Spatial scores were higher than her Nonverbal Reasoning. The magnitude of these differences was not only significant, but also unusual, typically occurring in 5% or less of children tested.
- Her Nonverbal Reasoning score must be interpreted cautiously since there was a significant difference between the two subtests. The difference was large enough to be significant but was not judged to be unusual since it typically occurs in about 15% of the children tested.
- Further complicating her Nonverbal Reasoning score was the significantly low score, compared to the mean of the test, on the Sequential & Quantitative Reasoning subtest. This finding amplifies the concern raised by the significant, but not unusual difference between Kate's Matrices and Sequential & Quantitative Reasoning subtest scores.
- Kate's within-cluster difference (higher Matrices, lower Sequential & Quantitative Reasoning) coupled with her significantly low Sequential & Quantitative Reasoning score suggests a specific weakness in the area of quantitative reasoning.
- Analysis of Kate's shared processing abilities suggests some difficulty in the areas of Knowledge of Quantitative Concepts and Verbal Short-Term Memory.
- Her Recall of Digits being so much lower than her Recall of Objects supports the hypothesis of a possible weakness in verbal short-term memory. It also suggests that Kate's memory skills may be enhanced when the things to be recalled are meaningful (objects) versus non-meaningful (strings of non-related numbers), and when the things to recall are presented visually as opposed to simply auditorally.
- Further investigation of Kate's quantitative abilities would be prudent. The *Woodcock-Johnson Psycho-Educational Battery-Revised* (WJ-R) Math Computation, Math Applied Problems, and Quantitative Concepts subtests would help sort out her current achievement levels in simple calculation, math reasoning, and math knowledge, especially if the examiner tested the limits by pointing out errors and allowing her to make corrections (which could not be counted in the scores) with a calculator.
- It would also be prudent to investigate further Kate's fluid reasoning abilities without involving formal mathematics. Since she has already taken a matrices test on the DAS, we could not use the similar SB:FE or Raven's Progressive Matrices tests. The WJ-R Analysis-Synthesis and Concept Formation tests would offer additional assessments of different types of fluid reasoning.

- Finally, it would also be important to learn more about Kate's verbal memory abilities. The examiner might consider a memory test, such as the Children's Memory Scale, or at least the verbal portions of such a test.

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ANNOTATED BIBLIOGRAPHY

ylward, G. P. (1992). Review of the Differential Ability Scales. In J. J. Kramer & J. C. Conoley (Eds.), *Eleventh mental measurements yearbook* (pp. 281-282). ncoln, NE: Buros Institute of Mental Measurements.

ain, S. K. (1991). Review of the Differential Ability Scales. *Journal of Psychoeducational Assessment*, 9, 372-378.

uss, S. A., Giesbrecht, T., Othman, O., & Singley, J. (year unknown). *Preschool performance on the Differential Ability Scale and the K-ABC.* Unpublished anuscript, University of Wisconsin-River Falls.

> Compared the performance of 25 non-handicapped preschool children on the DAS and K-ABC. Strong correlations were found with Mental Processing Composite/GCA r=.78 and Global Intelligence composite/GCA r=.75. "These substantial correlations indicate consistency in measuring similar abilities between the tests."

uss, S. A., Giesbrecht, T., Othman, O., & Singley, J. (year unknown). *Second and third grade performance on the Differential Ability Scale and the K-ABC.* npublished manuscript, University of Wisconsin-River Falls.

> Compared the performance of 58 regular education second and third grade children on the DAS and K-ABC. Strong correlations were found between the global scales of the two tests with Mental Processing Composite/GCA r=.66 and Global Intelligence composite/GCA r=.74. "...ascribing validity to the DAS as an acceptable measure of cognitive functioning in school age children." Differences were noted between the scores obtained on the SEQ-V, SEQ-NV, and SEQ-Spatial scales "thereby suggesting that these scales may be statistically independent and may thus be measuring different constructs." "The substantial correlations between the GCA and ACH, which was greater than the MPC-GCA correlation, suggests that the DAS core subtests may well be measuring acquired knowledge and prior learning as well as immediate problem solving ability. Similarly high GCA-VIC and GCA-GIC correlations may also reflect the achievement related task demands of the DAS core subtests, suggesting that the GCA may also measure achievement of school age children."

aden, J. P. (1992). The Differential Ability Scales and special education. *Journal of Psychoeducational Assessment, 10*, 92-98.

A review of the DAS with special emphasis on how well it may be used to identify and to plan for children with learning disabilities. "Extensive data, meticulously provided in the Technical Manual, suggest that the instrument is a psychometric improvement over existing techniques for measuring intellectual abilities and for determining intra-cognitive and aptitude-achievement discrepancies."

yrd, P. D., & Buckhalt, J. A. (1991). A multitrait-multimethod construct validity study of the Differential Ability Scales. *Journal of Psychoeducational Assessment*, 121-129.

gnina, P. A. (1991). A study of the construct validity of the Differential Ability Scales (DAS) for children with language impairments. Unpublished master's thesis, niversity of Central Florida.

oss, D. L. (1993). DAS and WISC-III: Response pattern and cognitive profiles among children with ADD symptomatology, Unpublished Masters Thesis

umont, R., Cruse, C. L., Price, L., & Whelley, P. (1996). The relationship between the Differential Ability Scales (DAS) and the Wechsler Intelligence Scale for hildren-Third Edition (WISC-III) for students with learning disabilities. *Psychology in the Schools*, 33, 203-209.

The DAS and WISC-III was administered to a sample of 53 children identified as having a learning disability. Each of the children had been administered the WISC-III and approximately 3 years later, was administered the DAS. For this group, all of the DAS composites correlated moderately with the WISC-III Full Scale IQ (range .64 to .78). There was a high (.78) correlation between the DAS GCA and the WISC-III Full Scale IQ. The DAS Verbal score correlated highest with the WISC-III Verbal IQ (.77), while the DAS Nonverbal Reasoning score correlated higher with the WISC-III Performance than with the Verbal (.55 vs. .65). The DAS Spatial cluster correlated highest with the WISC-III Performance scale (.67). The DAS Verbal, Nonverbal, Spatial, and GCA scores were slightly lower than the WISC-III Verbal, Performance, and Full Scales. The average difference between the GCA and the Full Scale IQ was 2.4 points (87.2 vs. 89.7) and may reflect the differences in the constructs measured by the two tests.

umont, R., Willis, J. O., Farr L. P., McCarthy, T., & Price, L. (2000) The relationship between the Differential Ability Scales (DAS) and the Woodcock-Johnson evised-Cognitive (WJ-R COG) for a Sample of Referred Children. *Journal of Psychoeducational Assessment, 18*, 27-38.

The Differential Ability Scales (DAS) and the Woodcock-Johnson Tests of Cognitive Ability - Revised (WJ-R COG standard battery) were administered to 81 children referred for Special Education services evaluation. The WJ-R BCA-STD correlated .65 with the DAS GCA, .64 with the DAS Verbal, .50 with the DAS Nonverbal Reasoning, and .51 with the DAS Spatial clusters. Mean differences (DAS vs. WJ-R BCA-STD) were -2.80 (GCA), -0.74 (Verbal), -6.07 (Nonverbal Reasoning), and 0.84 (Spatial). Dumont et al. (2000, p. 36) characterized the correlation between the CGA and BCA-STD as significant, but only moderate. Some, but not all of the correlations between DAS and WJ-R subtests conformed to predictions based on broad and narrow ability classifications from the McGrew, Flanagan, and Ortiz Integrated Carroll/Cattell-Horn Gf-Gc theory (McGrew & Flanagan, 1998). Dumont et al. caution against the assumption that subtests purporting to measure the same broad and narrow abilities will actually yield comparable scores for any individual.

liott, C. D. (1990). The nature and structure of children's abilities: Evidence from the Differential Ability Scales. *Journal of Psychoeducational Assessment*, 8, 376-0.

Topics: The problem with "intelligence"; Focus and assumption; The nature of psychometric *g*; The structure of abilities, Specificity of cluster and subtest scores.

lliott, C.D. (1993). Differential Ability Scale (DAS). *Child Assessment News*, 3(2), 1-10.

lliott, C.D., Daniel, M.H., & Guiton, G. (1991). Preschool cognitive assessment with the Differential Ability Scales. In B. A. Bracken (Ed.), *The Psychoeducational ssessment of Preschool Children*, (2nd ed.). Boston: Allyn & Bacon.

A comprehensive review of the DAS for preschool assessment. Topics: Description of the DAS; preschool level of the cognitive battery; Description and interpretation of the core subtests; Description and interpretation of the diagnostic subtests; Technical Characteristics; Factor structure; Correlations to other tests; An approach to Interpretation.

lliott, C. D. (1997). The Differential Ability Scales. In D. F. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, ts, and issues* (pp. 183-208). New York: Guilford.

lliott, S. N. (1990). The nature and structure of the DAS: Questioning the test's organizing model and use. *Journal of Psychoeducational Assessment*, 8, 406-411.

lanagan, D. P., & Alfonso, V. C. (1995). A critical review of the technical characteristics of new and recently revised intelligence tests for preschool children. *urnal of Psychoeducational Assessment*, 13, 66-90.

ridley, B. E., & McIntosh, D. E. (1992). Review of the Differential Ability Scales. In D. J. Keyser & R. C. Sweetland (Eds.), *Test Critiques* (Vol. 9, pp. 167-183). ansas City, MO: Test Corporation of America.

ansen, C. R., & Olsen, J. (1993). Fra WISC til DEP (1) [From WISC to DEP (1)]. *Psykologisk Paedagogisk Radgivning*, 30, 363-371.

olland, A. M., & McDermott, P. A. (1996). Discovering core profile types in the school-age standardization sample of the Differential Ability Scales. *Journal of ychoeducational Assessment*, 14, 131-146.

ull, T., & Mason, H. (1995). The conversion of a psychometric test for use with the blind. *Educational Psychology in Practice*, 10, 220-224.

vin, M. G. (1992). Preschool assessment with the Differential Ability Scales (DAS). *Journal of Psychoeducational Assessment*, 10, 99-102.

Topics: Why Test Preschoolers; Theoretical Construct; Technical Qualities; Other Test Choice Considerations. "Given its heuristic theoretical orientation, the solid psychometric properties of the test, and its economy of testing time in its use with young children, an early investment of money and time to master the DAS appears warranted."

eith, T. Z. (1990). Confirmatory and hierarchical confirmatory analysis of the Differential Ability Scales. *Journal of Psychoeducational Assessment*, 8, 391-405.

This study determined whether the DAS measures the same constructs across its wide age range, and what constructs and abilities were being measured by the DAS. "...suggested that the constructs measured by the DAS are quite consistent across overlapping age ranges. ... suggested that the DAS first provides a good measure of g, general intelligence."

eith, T. Z., Quirk, K. J., Schartzer, C., & Elliott, C. D. (in press). Construct bias in the Differential Ability Scales? Confirmatory and hierarchical factor structure ross three ethnic groups. *Journal of Psychoeducational Assessment*.

ercher, A. C., & Sandoval, J. (1991). Reading disability and the Differential Ability Scales. *Journal of School Psychology*, 29, 293-307.

ynn, R. (1996). Racial and ethnic differences in intelligence in the United States on the Differential Ability Scale. *Personality and Individual Differences*, 20, 271-3.

cDermott, P. A. (1995). Sex, race, class, and other demographics as explanations for children's ability and adjustment: A national appraisal. *Journal of School ychology*, 33, 75-91.

cDermott, P. A., & Glutting, J. J. (1997). Informing stylistic learning behavior, disposition, and achievement through ability subtests: Or, more illusions of eaning? *School Psychology Review*, 26, 163-175.

cGhee, R. (1993). Fluid and crystallized intelligence: Confirmatory factor analyses of the Differential Ability Scales, Detroit Tests of Learning Aptitude-3, and oodcock-Johnson Psycho-Educational Battery-Revised. *Journal of Psychoeducational Assessment* [Monograph Series: Woodcock-Johnson Psycho-Educational attery-Revised monograph], 20-38.

cGrew, K. S., & Flanagan, D. P. (1998). *The Intelligence Test Desk Reference (ITDR): Gf-Gc Cross-Battery Assessment*. Boston: Allyn & Bacon.

cIntosh, D. E., Brown, M. L., & Ross, S. L. (1995). Relationship between the Bracken Basic Concept Scale and the Differential Ability Scales with an at-risk mple of preschoolers. *Psychological Reports*, 76, 219-224.

cIntosh, D. E., & Gridley, B. E. (1993). Differential Ability Scales: Profiles of learning-disabled subtypes. *Psychology in the Schools*, 30, 11-24.

> Ward’s method of cluster analysis was used to group 83 school verified children with learning disabilities from the standardization sample. Six subgroups were identified. "The study provided evidence of the DAS’s ability to diagnose the learning disabled differentially and provide distinct profiles of LD subgroups."

cIntosh, D. E., Mulkins, R., Pardue-Vaughn, L., Barnes, L. L., et al. (1992). The canonical relationship between the Differential Ability Scales Upper Preschool erbal and Nonverbal clusters. *Journal of School Psychology*, 30, 355-361.

cIntosh, D. E., Wayland, S. J., Gridley, B., & Barnes, L. L. B. (1995). The relationship between the Bracken Basic Concept Scale and the Differential Ability ales with a preschool sample. *Journal of Psychoeducational Assessment*, 13, 39-48.

inger, E.J. (1992). Teaching Differential Ability Scales tasks according to Sternberg's theory of human intelligence. Unpublished master's thesis, Wichita State niversity.

att, L. O., Kamphaus, R. W., Keltgen, J., & Gilliland, F. (1991). An overview and review of the Differential Ability Scales: Initial and current research findings. urnal of School Psychology*, 29, 271-277.

> Topics: Purpose and Design; Rationale and Theoretical Background; Psychometric Properties; Conclusions. "These features of the DAS may be harbingers of the future of intelligence testing. The DAS appears to have promise as a useful addition to the field of intelligence testing and seems to be worthy of at least trail clinical and research use."

einehr, R. C. (1992). Review of the Differential Ability Scales. In J. J. Kramer & J. C. Conoley (Eds.), *Eleventh mental measurements yearbook* (pp. 282-283). ncoln, NE: Buros Institute of Mental Measurements.

ccio, C. A., Ross, C. M., Boan, C. H., Jemison, S., & Houston, F. (1997). Use of the Differential Ability Scales (DAS) Special Nonverbal Composite among young ildren with linguistic differences. *Journal of Psychoeducational Assessment*, 15, 196-204.

ndoval, J. (1992). Using the DAS with multi-cultural populations: Issues of test bias. *Journal of Psychoeducational Assessment*, 10, 88-91.

> This is an excellent, short article addressing the issues of Bias and face Validity, Bias and Content Validity, Bias and the Test Construct, and Bias and Predictive Validity. "My overall conclusion is that the DAS is one of the least obviously biased tests available today. The test development and the test results have resulted in a relatively culturally fair measure...I for one believe that having a diagnostic test such as the DAS will be important for all children and that, as we learn more about it, we will be able to use it with increasing levels of confidence."

apiro, S. K., Buckhalt, J. A., & Herod, L. A. (1995). Evaluation of learning-disabled students with the Different Ability Scales (DAS). *Journal of School ychology*, 33, 247-263.

elling, K. (1992). Dansk evneprove [Danish Ability Test]. *Psykologisk Paedagogisk Radgivning*, 29, 127-132.

one, B. J. (1992). Prediction of achievement by Asian-American and White children. (1992). *Journal of School Psychology*, 30, 91-99.

one, B. J. (1992). Joint confirmatory factor analysis of the DAS and WISC-R. *Journal of School Psychology*, 30, 185-195.

> A 4 factor solution emerged, consisting of Verbal conceptual, Visual Spatial, Attention-Quantitative, and Processing Speed.

sing The Differential Ability Scales in ADHD Assessment, (Author unknown)

> The DAS was administered to 55 children, 18 identified as ADHD on the basis of DSM-III-R criteria while 37 were randomly selected and not receiving any special education services. Discrepancies based upon T test comparisons were made. "As a group the children classified as ADHD scored lowest on the three subtests whose tasks are most dependent on sustained attention (Seq & Quant. Reasoning, Recall of Digits, Speed of Information Processing)." Discriminate analysis indicated that 70.6% of the ADHD group were correctly identified by a linear combination of SEQ, RD, and SIP.

oungstrom, E.A., Kogos, J.L. & Glutting, J.J. (1999). Incremental efficacy of Differential Ability Scales factor scores in predicting individual achievement criteria. *hool Psychology Quarterly*, 14, 26-39.

p://www.cc.emory.edu/EMORY_REPORT/erarchive/1996/August/ERaug.26/8_26_96mervis.html Psychologist, team first to link gene to cognitive trait

p://www.rasch.org/rmt/rmt42.html Differential Ability Scales, M Daniel

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Differential Ability Scales (DAS)

REFERENCES

arrow-Woolfolk, E. (1996) *Oral and Written Language Scales* Circle Pines MN: American Guidance Service

umont, R. Cruse, C., Price, L. & Whelley, P. (1996) The relationship between the Differential Ability Scales and the WISC-III for students with arning disabilities. *Psychology in the Schools.* 33.3, 203-209

umont, R., Willis, J. O., Farr, L. P., McCarthy, T., & Price, L. (2000). The relationship between the Differential Ability Scales (DAS) and the Woodcock-hnson Tests of Cognitive Ability-Revised (WJ-R COG) for students referred for special education evaluations. *Journal of Psychoeducational ssessment, 18*, 27-38.

liott, C. D. (1990a) *DAS Administration and Scoring Manual* San Antonio TX: The Psychological Corporation

liott, C. D. (1990b) *DAS Introductory and Technical Handbook* San Antonio TX: The Psychological Corporation

anagan, D. P., McGrew, K. S. & Ortiz, S. O. (2000). *The Wechsler Intelligence Scales and Gf-Gc Theory: A Contemporary Approach to terpretation*. Boston: Allyn and Bacon.

anagan, D. P., & Ortiz, S. O. (2000). *Essentials of Cross-Battery Assessment*. New York: Wiley & Sons.

ynn, J. R. (1998). IQ gains over time: Toward finding the causes. In U. Neisser (Ed.), The rising curve: Long-term gains in IQ and related measures. ashington, D.C.: American Psychological Association.

aplan, E. (1988). A process approach to neuropsychological assessment. In T. Boll & B. K. Bryant (Eds.), *Clinical neuropsychology and brain nction: Research, measurement, and practice*. Washington: American Psychological Association.

rtiz, S. O. & Flanagan, D. P. (1998). G*f*-G*c* cross-battery interpretation and selective cross-battery assessment: Referral concerns and the needs of lturally and linguistically diverse populations. In K. S. McGrew & D. P. Flanagan, *The Intelligence Test Desk Reference (ITDR): Gf-Gc Cross-Battery ssessment* (pp. 401-444). Boston: Allyn and Bacon.

oungstrom, E. A., Kogos, J. L., & Glutting, J. J. (1999) Incremental efficacy of the Differential Ability Scales factor scores in predicting individual hievement criteria. *School Psychology Quarterly*, 14, 26-39.

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