

# 5

## Reliability and Validity



### Reliability

Reliability refers to a test's stability, consistency, and accuracy. When used to measure a stable construct, scores that are highly reliable will yield consistent, accurate results across factors such as time and examiner. The following section considers several indicators of reliability, including internal consistency, standard error of measurement, stability of test scores over time, as well as inter-scorer consistency on the subjective scoring of AAB subtests.

#### Internal Consistency

Coefficient alpha is a commonly used measure of internal consistency when there are multiple items within a subtest or composite assessing the same construct. The most widely used statistic for estimating this is Cronbach's (1951) alpha. An overview of the internal consistency reliability coefficients for each AAB subtest and composite for the age- and grade-based normative samples can be found in Table 5.1. As shown in Table 5.1, these range from .77 to .98, indicating an overall high level of internal consistency. In addition, the internal consistencies for the AAB subtests and composites are also reported for each of the normative age and grade groups (see Tables 5.2 through 5.9).

#### Standard Error of Measurement

Standard error of measurement (*SEM*) is an alternate measure of reliability. The formula for the *SEM* is based on the coefficient alpha (see Tables 5.2 through 5.9) and the standard deviation for each subtest (in standard units). When multiplied by a critical value and banded around an individual's score, the *SEM* provides a range of scores into which an individual's true score is likely to fall. For more information about the development of confidence intervals, see Chapter 3 of this Professional Manual. The *SEMs* for the AAB are presented in Tables 5.10 through 5.13. Confidence intervals based on the *SEMs* can be found in Appendixes B, C, and D for the age- and grade-based normative samples.

#### Test-Retest Reliability

Test score stability refers to the extent to which an individual's test performance remains constant over time. The stability of the AAB subtest and composite scores over time was evaluated by retesting a subset of individuals from the standardization sample. Demographic characteristics of the test-retest sample are presented in Table 5.14. The interval between the two test administrations ranged from 7 to 49 days, with a median test-retest interval of 18 days. The correlations between Time 1 scores and Time 2 scores are provided in Table 5.15. The test-retest coefficients range from .74 to .95 for the subtests and from .79 to .95 for the composites, which indicates a high degree of temporal stability.

#### Inter-Scorer Reliability

Inter-scorer reliability refers to the amount of error attributed to examiner variability in the scoring of the test. To measure inter-scorer reliability, two trained individuals scored a set of tests independently. The correlation between those independent sets of test scores indicates the degree of agreement between the scorers. Only the Pre-Writing Skills and Written Composition subtests were included in this type of analysis because their scoring is subjective.

#### Pre-Writing Skills

To assess the inter-scorer reliability of the Pre-Writing Skills subtest, 20 randomly selected protocols were scored independently by two trained research assistants. The scores were never discrepant by more than 1 point on any figure. Furthermore, the average difference between the total raw scores assigned by each scorer was only 1.6 points, with the total raw scores being the same or within 1 point of each other 55% of the time. In addition, intraclass correlation coefficients (ICCs) were calculated for the Pre-Writing Skills subtest using a two-way random effects model (consistency type). The ICCs ranged from .64 to .96 across the seven Pre-Writing Skills items (see Table 5.16). The ICC was also calculated for the Pre-Writing Skills total score and found to be high (.89).

**Table 5.1**  
**Reliability Coefficients of AAB Subtests and Composites by Age and Grade**

Subtest/composite	Age-based sample	Grade-based sample	
		Fall	Spring
Reading Foundational Skills	.95	.95	.94
Letter/Word Reading	.94	.97	.97
Reading Fluency	.94	.91	.91
<b>Basic Reading</b>	<b>.96</b>	<b>.98</b>	<b>.98</b>
Reading Comprehension: Words and Sentences	.90	.96	.95
Reading Comprehension: Passages	.88	.81	.81
<b>Reading Comprehension</b>	<b>.94</b>	<b>.96</b>	<b>.96</b>
Listening Comprehension: Words and Sentences	.77	.88	.87
Listening Comprehension: Passages	.81	.78	.78
<b>Listening Comprehension</b>	<b>.81</b>	<b>.84</b>	<b>.86</b>
Oral Fluency	.80	.79	.79
Oral Expression	.84	.91	.92
Oral Production	.83	.80	.80
<b>Expressive Communication</b>	<b>.88</b>	<b>.90</b>	<b>.91</b>
Pre-Writing Skills	.92	.90	.91
Spelling	.94	.97	.97
Written Composition	.89	.93	.93
<b>Written Expression</b>	<b>.95</b>	<b>.95</b>	<b>.96</b>
<b>Mathematical Calculation</b>	<b>.92</b>	<b>.93</b>	<b>.92</b>
<b>Mathematical Reasoning</b>	<b>.95</b>	<b>.95</b>	<b>.96</b>
<b>Academic Achievement Battery</b>	<b>.92</b>	<b>.94</b>	<b>.94</b>

*Note.* Test-retest correlations were used for Reading Fluency, Reading Comprehension: Passages, Listening Comprehension: Passages, Oral Fluency, and Oral Production subtests. Correlations for these subtests were corrected for attenuation (Thorndike, 1949). All other subtests used the internal consistency. Those correlations were corrected for the variability of the standardization sample (Allen & Yen, 1979; Magnusson, 1967).

**Table 5.2**  
**Reliability Coefficients of AAB Subtests for Individuals Ages 4 to 18 Years**

Subtest	Age (years)															Overall average $r_{xx}^a$
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Reading Foundational Skills	.90	.94	.94	.80	.81	.91	—	—	—	—	—	—	—	—	—	.90
Letter/Word Reading	.93	.90	.92	.93	.92	.92	.93	.90	.92	.91	.93	.92	.91	.91	.90	.92
Reading Fluency	.99	.99	.99	.99	.99	.99	.99	.85	.85	.85	.85	.85	.85	.85	.85	.96
Reading Comprehension: Words and Sentences	.92	.89	.90	.90	.87	.87	.91	.86	.93	.87	.80	.83	.90	.83	.83	.88
Reading Comprehension: Passages	—	.96	.93	.92	.94	.94	.90	.86	.86	.86	.86	.86	.86	.86	.87	.90
Listening Comprehension: Words and Sentences	.79	.79	.78	.79	.78	.84	.76	.72	.72	.71	.71	.72	.76	.71	.73	.76
Listening Comprehension: Passages	.85	.85	.85	.85	.85	.85	.85	.82	.82	.82	.82	.82	.82	.82	.82	.83
Oral Fluency	.77	.77	.77	.77	.77	.77	.77	.83	.83	.83	.83	.83	.83	.83	.83	.80
Oral Expression	.76	.80	.74	.80	.77	.79	.81	.80	.85	.83	.77	.79	.77	.82	.83	.80
Oral Production	.92	.92	.92	.92	.92	.92	.92	.80	.80	.80	.80	.80	.80	.80	.80	.87
Pre-Writing Skills	.89	.86	.88	.86	.92	.92	—	—	—	—	—	—	—	—	—	.89
Spelling	.84	.86	.86	.89	.89	.89	.90	.89	.90	.90	.91	.92	.92	.92	.93	.90
Written Composition	—	—	—	—	.91	.91	.85	.85	.88	.88	.87	.88	.87	.89	.88	.88
Mathematical Calculation	.79	.75	.83	.84	.84	.84	.85	.85	.89	.88	.86	.87	.86	.87	.87	.85
Mathematical Reasoning	.64	.66	.76	.82	.87	.87	.94	.94	.95	.95	.93	.94	.94	.94	.94	.90

*Note.* Test-retest correlations were used for Reading Fluency, Reading Comprehension: Passages, Listening Comprehension: Passages, Oral Fluency, and Oral Production subtests. Correlations for these subtests were corrected for attenuation (Thorndike, 1949). All other subtests used the internal consistency. Those correlations were corrected for the variability of the standardization sample (Allen & Yen, 1979; Magnusson, 1967).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.3**  
**Reliability Coefficients of AAB Subtests for Individuals Ages 19 to 65+ Years**

Subtest	Age (years)						Overall average $r_{xx}^a$
	19-21	22-24	25-34	35-54	55-64	65+	
Letter/Word Reading	.91	.92	.93	.94	.94	.93	.93
Reading Fluency	.95	.95	.95	.95	.95	.95	.95
Reading Comprehension: Words and Sentences	.84	.87	.84	.95	.90	.88	.89
Reading Comprehension: Passages	.74	.80	.81	.78	.78	.74	.78
Listening Comprehension: Words and Sentences	.71	.71	.71	.73	.77	.72	.73
Listening Comprehension: Passages	.79	.79	.79	.79	.79	.79	.79
Oral Fluency	.80	.80	.80	.80	.80	.80	.80
Oral Expression	.80	.80	.93	.86	.90	.82	.86
Oral Production	.75	.75	.75	.75	.75	.75	.75
Spelling	.92	.93	.93	.85	.95	.95	.93
Written Composition	.89	.90	.89	.90	.90	.94	.91
Mathematical Calculation	.89	.90	.91	.98	.90	.90	.92
Mathematical Reasoning	.95	.95	.95	.96	.96	.96	.96

Note. Test-retest correlations were used for Reading Fluency, Reading Comprehension: Passages, Listening Comprehension: Passages, Oral Fluency, and Oral Production subtests. Correlations for these subtests were corrected for attenuation (Thorndike, 1949). All other subtests used the internal consistency. Those correlations were corrected for the variability of the standardization sample (Allen & Yen, 1979; Magnusson, 1967). The Reading Foundational Skills and Pre-Writing Skills subtests were not administered to this group due to age.

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.4**  
**Reliability Coefficients of AAB Composites for Individuals Ages 4 to 18 Years**

Composite	Age (years)														Overall average $r_{xx}^a$	
	4	5	6	7	8	9	10	11	12	13	14	15	16	17		18
Basic Reading	.99	.99	.99	.99	.99	.99	.94	.94	.94	.94	.94	.94	.94	.94	.94	.97
Reading Comprehension	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Listening Comprehension	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86
Expressive Communication	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
Written Expression	.94	.94	.94	.94	.97	.97	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93
Mathematical Calculation	.79	.75	.83	.84	.84	.84	.85	.85	.89	.88	.86	.87	.86	.87	.87	.85
Mathematical Reasoning	.64	.66	.76	.82	.87	.87	.94	.94	.95	.95	.93	.94	.94	.94	.94	.90
Academic Achievement Battery	.89	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92

Note. The reliabilities for the composites were calculated with the formula recommended by Guilford (1954) and Nunnally (1978).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.5**  
**Reliability Coefficients of AAB Composites for Individuals Ages 19 to 65+ Years**

Composite	Age (years)						Overall average $r_{xx}^a$
	19-21	22-24	25-34	35-54	55-64	65+	
Basic Reading	.94	.94	.94	.94	.94	.94	.94
Reading Comprehension	.92	.92	.92	.92	.92	.92	.92
Listening Comprehension	.86	.86	.86	.86	.86	.86	.86
Expressive Communication	.90	.90	.90	.90	.90	.90	.90
Written Expression	.93	.93	.93	.93	.93	.93	.93
Mathematical Calculation	.89	.90	.91	.98	.90	.90	.92
Mathematical Reasoning	.95	.95	.95	.96	.96	.96	.96
Academic Achievement Battery	.89	.92	.92	.92	.92	.92	.92

Note. The reliabilities for the indexes were calculated with the formula recommended by Guilford (1954) and Nunnally (1978).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.6**  
**Reliability Coefficients of AAB Subtests for Individuals in PK to Grade 12: Fall Semester**

Subtest	Grade														Overall average $r_{xx}^a$
	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	
Reading Foundational Skills	.93	.91	.87	.69	.78	—	—	—	—	—	—	—	—	—	.86
Letter/Word Reading	.94	.87	.89	.85	.93	.93	.91	.94	.92	.91	.91	.90	.91	.88	.91
Reading Fluency	.98	.98	.98	.98	.98	.98	.98	.89	.89	.89	.89	.89	.89	.89	.95
Reading Comprehension: Words and Sentences	.90	.91	.92	.89	.90	.88	.84	.83	.81	.82	.82	.83	.80	.81	.86
Reading Comprehension: Passages	—	.91	.91	.91	.91	.91	.91	.83	.83	.83	.83	.83	.83	.83	.87
Listening Comprehension: Words and Sentences	.83	.82	.83	.81	.83	.82	.74	.73	.73	.73	.72	.69	.67	.75	.77
Listening Comprehension: Passages	.85	.85	.85	.85	.85	.85	.85	.81	.81	.81	.81	.81	.81	.81	.83
Oral Fluency	.79	.79	.79	.79	.79	.79	.79	.81	.81	.81	.81	.81	.81	.81	.80
Oral Expression	.79	.76	.76	.72	.77	.78	.76	.81	.78	.80	.76	.78	.81	.84	.78
Oral Production	.92	.92	.92	.92	.92	.92	.92	.75	.75	.75	.75	.75	.75	.75	.86
Pre-Writing Skills	.82	.86	.83	.90	.94	—	—	—	—	—	—	—	—	—	.88
Spelling	.81	.80	.86	.85	.87	.89	.91	.90	.88	.92	.89	.90	.92	.92	.88
Written Composition	—	—	—	—	.84	.91	.82	.88	.86	.82	.85	.78	.87	.85	.85
Mathematical Calculation	.80	.75	.80	.82	.74	.87	.83	.83	.86	.88	.86	.84	.87	.89	.84
Mathematical Reasoning	.77	.80	.82	.85	.88	.92	.93	.94	.94	.93	.95	.95	.92	.94	.91

Note. Test-retest correlations were used for Reading Fluency, Reading Comprehension: Passages, Listening Comprehension: Passages, Oral Fluency and Oral Production subtests. Correlations for these subtests were corrected for attenuation (Thorndike, 1949). All other subtests used the internal consistency. Those correlations were corrected for the variability of the standardization sample (Allen & Yen, 1979; Magnusson, 1967).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.7**  
**Reliability Coefficients of AAB Subtests for Individuals in PK to Grade 12: Spring Semester**

Subtest	Grade														Overall average $r_{xx}^a$
	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	
Reading Foundational Skills	.93	.93	.80	.79	.55	—	—	—	—	—	—	—	—	—	.84
Letter/Word Reading	.95	.97	.92	.95	.95	.93	.93	.95	.94	.94	.95	.92	.93	.94	.94
Reading Fluency	.98	.98	.98	.98	.98	.98	.98	.89	.89	.89	.89	.89	.89	.89	.95
Reading Comprehension: Words and Sentences	.96	.96	.89	.90	.91	.90	.91	.93	.87	.88	.91	.76	.84	.87	.90
Reading Comprehension: Passages	—	.91	.91	.91	.91	.91	.91	.83	.83	.83	.83	.83	.83	.83	.87
Listening Comprehension: Words and Sentences	.87	.92	.76	.80	.83	.80	.77	.78	.75	.76	.76	.70	.77	.75	.80
Listening Comprehension: Passages	.85	.85	.85	.85	.85	.85	.85	.81	.81	.81	.81	.81	.81	.81	.83
Oral Fluency	.79	.79	.79	.79	.79	.79	.79	.81	.81	.81	.81	.81	.81	.81	.80
Oral Expression	.91	.97	.82	.82	.83	.84	.84	.88	.87	.86	.86	.78	.88	.85	.87
Oral Production	.92	.92	.92	.92	.92	.92	.92	.75	.75	.75	.75	.75	.75	.75	.86
Pre-Writing Skills	.86	.88	.84	.89	.79	—	—	—	—	—	—	—	—	—	.85
Spelling	.95	.95	.92	.94	.95	.91	.92	.94	.93	.94	.96	.90	.93	.93	.94
Written Composition	—	—	—	—	.94	.89	.90	.91	.88	.85	.87	.87	.87	.85	.89
Mathematical Calculation	.77	.81	.79	.78	.80	.87	.81	.88	.77	.86	.88	.87	.86	.90	.84
Mathematical Reasoning	.93	.97	.96	.95	.95	.94	.96	.96	.95	.96	.94	.94	.96	.95	.95

Note. Test-retest correlations were used for Reading Fluency, Reading Comprehension: Passages, Listening Comprehension: Passages, Oral Fluency and Oral Production subtests. Correlations for these subtests were corrected for attenuation (Thorndike, 1949). All other subtests used the internal consistency. Those correlations were corrected for the variability of the standardization sample (Allen & Yen, 1979; Magnusson, 1967).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.8**  
**Reliability Coefficients of AAB Composites for Individuals in PK to Grade 12: Fall Semester**

Composite	Grade														Overall average $r_{xx}^a$
	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	
Basic Reading	.98	.98	.98	.98	.98	.94	.94	.94	.94	.94	.94	.94	.94	.94	.96
Reading Comprehension	.90	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93	.93
Listening Comprehension	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86
Expressive Communication	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
Written Expression	.93	.93	.93	.93	.92	.94	.94	.94	.94	.94	.94	.94	.94	.94	.94
Mathematical Calculation	.80	.75	.80	.82	.74	.87	.83	.83	.86	.88	.86	.84	.87	.89	.84
Mathematical Reasoning	.77	.80	.82	.85	.88	.92	.93	.94	.94	.93	.95	.95	.92	.94	.91
Academic Achievement Battery	.92	.93	.93	.93	.92	.94	.94	.94	.94	.94	.94	.94	.94	.94	.94

Note. The reliabilities for the indexes were calculated with the formula recommended by Guilford (1954) and Nunnally (1978).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

**Table 5.9**  
**Reliability Coefficients of AAB Composites for Individuals in PK to Grade 12: Spring Semester**

Composite	Grade														Overall average $r_{xx}^a$
	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	
Basic Reading	.98	.98	.98	.98	.98	.94	.94	.94	.94	.94	.94	.94	.94	.94	.96
Reading Comprehension	.96	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Listening Comprehension	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87
Expressive Communication	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
Written Expression	.94	.94	.94	.94	.93	.94	.94	.94	.94	.94	.94	.94	.94	.94	.94
Mathematical Calculation	.77	.81	.79	.78	.80	.87	.81	.88	.77	.86	.88	.87	.86	.90	.84
Mathematical Reasoning	.93	.97	.96	.95	.95	.94	.96	.96	.95	.96	.94	.94	.96	.95	.95
Academic Achievement Battery	.94	.94	.94	.94	.91	.94	.94	.94	.94	.94	.94	.94	.94	.94	.94

Note. The reliabilities for the indexes were calculated with the formula recommended by Guilford (1954) and Nunnally (1978).

<sup>a</sup>Average reliability coefficients were calculated with Fisher's z transformation (Fisher, 1915, 1921).

### Written Composition

To assess the inter-scorer reliability of the Written Composition subtest, 20 randomly selected protocols were scored independently by two trained research assistants. The average difference between the total raw scores assigned by each scorer was only 1.5 points, with the totals being the same or within 1 point of each other 60% of the time. In addition, across the seven criteria that make up the Written Composition subtest, the ICCs ranged from .78 to .95 (see Table 5.17). An ICC was also calculated for the Written Composition subtest total score and found to be high (.97).

### Validity

A valid test is one that accurately measures the psychological construct for which it is intended. Test validity is multidimensional in nature and should be evaluated using a variety of different sources and methodologies, each providing unique evidence that supports the validity of the test. In the following sections, intercorrelations between AAB subtests and composites as well as content,

construct, and criterion validity are considered together as evidence of the AAB's validity.

### Intercorrelations

Intercorrelations between subtests and composite scores for the age- and grade-based samples can be found in Appendix N of this Professional Manual.

### Content Validity

Content validity is the extent to which items included on a test represent the domain being assessed (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014; Anastasi & Urbina, 1997). While the AAB items were developed, a thorough review of the academic standards related to each construct area was conducted and used as a guide. More information regarding AAB content development can be found in Chapter 4 of this Professional Manual. For an overview of item characteristics, see Appendix I of this Professional Manual.

During the development of the AAB, multiple rounds of item review were conducted to ensure that the resulting

**Table 5.10**  
**Standard Errors of Measurement for AAB Subtests and Composites for Individuals Ages 4 to 18 Years**

Subtest/composite	Age (years)															Mean
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Reading Foundational Skills	4.74	3.67	3.67	6.71	6.54	4.50	—	—	—	—	—	—	—	—	—	4.97
Letter/Word Reading	3.97	4.74	4.24	3.97	4.24	4.24	3.97	4.74	4.24	4.50	3.97	4.24	4.50	4.50	4.74	4.32
Reading Fluency	1.50	1.50	1.50	1.50	1.50	1.50	1.50	5.81	5.81	5.81	5.81	5.81	5.81	5.81	5.81	3.80
<b>Basic Reading</b>	<b>1.84</b>	<b>1.84</b>	<b>1.84</b>	<b>1.84</b>	<b>1.84</b>	<b>1.84</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.00</b>
Reading Comprehension: Words and Sentences	4.24	4.97	4.74	4.74	5.41	5.41	4.50	5.61	3.97	5.41	6.71	6.18	4.74	6.18	6.18	5.27
Reading Comprehension: Passages	—	3.00	3.97	4.24	3.67	3.67	4.74	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.41	4.86
<b>Reading Comprehension</b>	<b>4.24</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>
Listening Comprehension: Words and Sentences	6.87	6.87	7.04	6.87	7.04	6.00	7.35	7.94	7.94	8.08	8.08	7.94	7.35	8.08	7.79	7.42
Listening Comprehension: Passages	5.81	5.81	5.81	5.81	5.81	5.81	5.81	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.10
<b>Listening Comprehension</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>
Oral Fluency	7.19	7.19	7.19	7.19	7.19	7.19	7.19	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.65
Oral Expression	7.35	6.71	7.65	6.71	7.19	6.87	6.54	6.71	5.81	6.18	7.19	6.87	7.19	6.36	6.18	6.77
Oral Production	4.24	4.24	4.24	4.24	4.24	4.24	4.24	6.71	6.71	6.71	6.71	6.71	6.71	6.71	6.71	5.56
<b>Expressive Communication</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>
Pre-Writing Skills	4.97	5.61	5.20	5.61	4.24	4.24	—	—	—	—	—	—	—	—	—	4.98
Spelling	6.00	5.61	5.61	4.97	4.97	4.97	4.74	4.97	4.74	4.74	4.50	4.24	4.24	4.24	3.97	4.83
Written Composition	—	—	—	—	4.50	4.50	5.81	5.81	5.20	5.20	5.41	5.20	5.41	4.97	5.20	5.20
<b>Written Expression</b>	<b>3.59</b>	<b>3.59</b>	<b>3.59</b>	<b>3.59</b>	<b>2.54</b>	<b>2.54</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>3.73</b>
<b>Mathematical Calculation</b>	<b>6.87</b>	<b>7.50</b>	<b>6.18</b>	<b>6.00</b>	<b>6.00</b>	<b>6.00</b>	<b>5.81</b>	<b>5.81</b>	<b>4.97</b>	<b>5.20</b>	<b>5.61</b>	<b>5.41</b>	<b>5.61</b>	<b>5.41</b>	<b>5.41</b>	<b>5.85</b>
<b>Mathematical Reasoning</b>	<b>9.00</b>	<b>8.75</b>	<b>7.35</b>	<b>6.36</b>	<b>5.41</b>	<b>5.41</b>	<b>3.67</b>	<b>3.67</b>	<b>3.35</b>	<b>3.35</b>	<b>3.97</b>	<b>3.67</b>	<b>3.67</b>	<b>3.67</b>	<b>3.67</b>	<b>5.00</b>
<b>Academic Achievement Battery</b>	<b>4.97</b>	<b>4.16</b>	<b>4.16</b>	<b>4.16</b>	<b>4.26</b>	<b>4.26</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.27</b>

**Table 5.11**  
**Standard Errors of Measurement for AAB Subtests and Composites for Individuals Ages 19 to 65+ Years**

Subtest/composite	Age (years)						Mean
	19-21	22-24	25-34	35-54	55-64	65+	
Letter/Word Reading	4.50	4.24	3.97	3.67	3.67	3.97	4.00
Reading Fluency	3.35	3.35	3.35	3.35	3.35	3.35	3.35
<b>Basic Reading</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>	<b>3.77</b>
Reading Comprehension: Words and Sentences	6.00	5.41	6.00	3.35	4.74	5.20	5.12
Reading Comprehension: Passages	7.65	6.71	6.54	7.04	7.04	7.65	7.11
<b>Reading Comprehension</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>	<b>4.19</b>
Listening Comprehension: Words and Sentences	8.08	8.08	8.08	7.79	7.19	7.94	7.86
Listening Comprehension: Passages	6.87	6.87	6.87	6.87	6.87	6.87	6.87
<b>Listening Comprehension</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>	<b>5.70</b>
Oral Fluency	6.71	6.71	6.71	6.71	6.71	6.71	6.71
Oral Expression	6.71	6.71	3.97	5.61	4.74	6.36	5.68
Oral Production	7.50	7.50	7.50	7.50	7.50	7.50	7.50
<b>Expressive Communication</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>	<b>4.78</b>
Spelling	4.24	3.97	3.97	5.81	3.35	3.35	4.12
Written Composition	4.97	4.74	4.97	4.74	4.74	3.67	4.64
<b>Written Expression</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>	<b>4.06</b>
<b>Mathematical Calculation</b>	<b>4.97</b>	<b>4.74</b>	<b>4.50</b>	<b>2.12</b>	<b>4.74</b>	<b>4.74</b>	<b>4.30</b>
<b>Mathematical Reasoning</b>	<b>3.35</b>	<b>3.35</b>	<b>3.35</b>	<b>3.00</b>	<b>3.00</b>	<b>3.00</b>	<b>3.18</b>
<b>Academic Achievement Battery</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>	<b>4.23</b>

Note. The Reading Foundational Skills and Pre-Writing Skills subtests were not administered to this group due to age.



**Table 5.12**  
**Standard Errors of Measurement for AAB Subtests and Composites by Grade: Fall Semester**

Subtest/composite	Grade												Mean		
	PK	K	1	2	3	4	5	6	7	8	9	10		11	12
Reading Foundational Skills	4.08	4.60	5.41	8.35	7.10	—	—	—	—	—	—	—	—	—	5.91
Letter/Word Reading	3.67	5.41	4.97	5.81	3.97	3.97	4.50	3.67	4.24	4.50	4.50	4.74	4.50	5.2	4.55
Reading Fluency	2.12	2.12	2.12	2.12	2.12	2.12	2.12	4.97	4.97	4.97	4.97	4.97	4.97	4.97	3.55
<b>Basic Reading</b>	<b>2.06</b>	<b>2.06</b>	<b>2.06</b>	<b>2.06</b>	<b>2.06</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.08</b>
Reading Comprehension: Words and Sentences	4.74	4.50	4.24	4.97	4.74	5.20	6.00	6.18	6.54	6.36	6.36	6.18	6.71	6.54	5.66
Reading Comprehension: Passages	—	4.50	4.50	4.50	4.50	4.50	4.50	6.18	6.18	6.18	6.18	6.18	6.18	6.18	5.40
<b>Reading Comprehension</b>	<b>4.74</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.00</b>	<b>4.05</b>
Listening Comprehension: Words and Sentences	6.18	6.36	6.18	6.54	6.18	6.36	7.65	7.79	7.79	7.79	7.94	8.35	8.62	7.50	7.23
Listening Comprehension: Passages	5.81	5.81	5.81	5.81	5.81	5.81	5.81	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.18
<b>Listening Comprehension</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>	<b>5.52</b>
Oral Fluency	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.71
Oral Expression	6.87	7.35	7.35	7.94	7.19	7.04	7.35	6.54	7.04	6.71	7.35	7.04	6.54	6.00	7.02
Oral Production	4.24	4.24	4.24	4.24	4.24	4.24	4.24	7.50	7.50	7.50	7.50	7.50	7.50	7.50	5.87
<b>Expressive Communication</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>	<b>4.84</b>
Pre-Writing Skills	6.36	5.61	6.18	4.74	3.67	—	—	—	—	—	—	—	—	—	5.31
Spelling	6.54	6.71	5.61	5.81	5.41	4.97	4.50	4.74	5.20	4.24	4.97	4.62	4.24	4.24	5.13
Written Composition	—	—	—	—	6.00	4.50	6.36	5.20	5.61	6.36	5.81	7.02	5.41	5.81	5.81
<b>Written Expression</b>	<b>4.01</b>	<b>4.01</b>	<b>4.01</b>	<b>4.01</b>	<b>4.20</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>	<b>3.83</b>
<b>Mathematical Calculation</b>	<b>6.71</b>	<b>7.50</b>	<b>6.71</b>	<b>6.36</b>	<b>7.65</b>	<b>5.41</b>	<b>6.18</b>	<b>6.18</b>	<b>5.61</b>	<b>5.20</b>	<b>5.61</b>	<b>5.96</b>	<b>5.41</b>	<b>4.97</b>	<b>6.10</b>
<b>Mathematical Reasoning</b>	<b>7.19</b>	<b>6.71</b>	<b>6.36</b>	<b>5.81</b>	<b>5.20</b>	<b>4.24</b>	<b>3.97</b>	<b>3.67</b>	<b>3.67</b>	<b>3.97</b>	<b>3.35</b>	<b>3.35</b>	<b>4.24</b>	<b>3.67</b>	<b>4.67</b>
<b>Academic Achievement Battery</b>	<b>4.11</b>	<b>3.94</b>	<b>3.94</b>	<b>3.94</b>	<b>4.26</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.74</b>	<b>3.85</b>

**Table 5.13**  
**Standard Errors of Measurement for AAB Subtests and Composites by Grade: Spring Semester**

Subtest/composite	Grade												Mean		
	PK	K	1	2	3	4	5	6	7	8	9	10		11	12
Reading Foundational Skills	4.11	4.08	6.66	6.81	10.12	—	—	—	—	—	—	—	—	—	6.36
Letter/Word Reading	3.22	2.60	4.27	3.35	3.52	3.91	3.85	3.29	3.67	3.64	3.49	4.24	3.97	3.67	3.62
Reading Fluency	2.12	2.12	2.12	2.12	2.12	2.12	2.12	4.97	4.97	4.97	4.97	4.97	4.97	4.97	3.55
<b>Basic Reading</b>	<b>2.17</b>	<b>2.17</b>	<b>2.17</b>	<b>2.17</b>	<b>2.17</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.65</b>	<b>3.12</b>
Reading Comprehension: Words and Sentences	3.00	3.00	5.00	4.74	4.42	4.65	4.45	3.97	5.47	5.13	4.50	7.42	5.92	5.35	4.79
Reading Comprehension: Passages	—	4.50	4.50	4.50	4.50	4.50	4.50	6.18	6.18	6.18	6.18	6.18	6.18	6.18	5.40
<b>Reading Comprehension</b>	<b>3.00</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.11</b>	<b>4.03</b>
Listening Comprehension: Words and Sentences	5.41	4.24	7.38	6.71	6.18	6.72	7.19	7.00	7.53	7.35	7.35	8.28	7.27	7.50	6.87
Listening Comprehension: Passages	5.81	5.81	5.81	5.81	5.81	5.81	5.81	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.18
<b>Listening Comprehension</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>	<b>5.41</b>
Oral Fluency	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.71
Oral Expression	4.50	2.60	6.40	6.40	6.13	6.02	6.00	5.15	5.43	5.71	5.61	7.04	5.26	5.83	5.58
Oral Production	4.24	4.24	4.24	4.24	4.24	4.24	4.24	7.50	7.50	7.50	7.50	7.50	7.50	7.50	5.87
<b>Expressive Communication</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>	<b>4.80</b>
Pre-Writing Skills	5.59	5.28	6.07	4.97	6.89	—	—	—	—	—	—	—	—	—	5.76
Spelling	3.35	3.22	4.24	3.58	3.35	4.52	4.35	3.61	3.97	3.79	3.00	4.74	3.94	4.02	3.83
Written Composition	—	—	—	—	3.79	4.93	4.84	4.50	5.15	5.81	5.41	5.41	5.39	5.83	5.11
<b>Written Expression</b>	<b>3.64</b>	<b>3.64</b>	<b>3.64</b>	<b>3.64</b>	<b>3.86</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.60</b>	<b>3.63</b>
<b>Mathematical Calculation</b>	<b>7.20</b>	<b>6.54</b>	<b>6.86</b>	<b>7.04</b>	<b>6.71</b>	<b>5.41</b>	<b>6.50</b>	<b>5.15</b>	<b>7.19</b>	<b>5.63</b>	<b>5.30</b>	<b>5.41</b>	<b>5.61</b>	<b>4.86</b>	<b>6.10</b>
<b>Mathematical Reasoning</b>	<b>3.94</b>	<b>2.51</b>	<b>3.00</b>	<b>3.32</b>	<b>3.39</b>	<b>3.58</b>	<b>3.00</b>	<b>2.89</b>	<b>3.35</b>	<b>3.00</b>	<b>3.61</b>	<b>3.67</b>	<b>3.00</b>	<b>3.29</b>	<b>3.25</b>
<b>Academic Achievement Battery</b>	<b>3.53</b>	<b>3.69</b>	<b>3.69</b>	<b>3.69</b>	<b>4.45</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>	<b>3.81</b>

**Table 5.14**  
**Demographic Characteristics**  
**of the AAB Test-Retest Sample**

<b>Characteristic</b>	<b>Total</b>
<i>n</i>	147
<b>Gender (%)</b>	
Male	48.3
Female	51.7
<b>Age (years)</b>	
<i>M</i>	29.4
<i>SD</i>	18.7
Range	4-74
<b>Race/ethnicity (%)</b>	
Caucasian	66.7
African American	10.9
Hispanic	17.0
Other	5.4
<b>Education level (%)</b>	
<12 years	11.6
12 years	30.6
13-15 years	31.3
16+ years	26.5

Note. Parent education level is used for individuals ages 4 to 21 years.

test represented the content it was designed to measure. As discussed in Chapter 4, the expert panel (a) reviewed items across all subtests to ensure that the content represented the intended constructs, (b) provided feedback on the face validity of the subtests and the quality of the items, and (c) advised on the appropriateness of the tasks across the age and grade range. This item evaluation process ensured that only items that best represented each construct were included in the final assessment.

### **Construct Validity**

Construct validity is the extent to which a test measures the theoretical construct or trait it is designed to measure. The construct validity of the AAB was established by examining its relationship to other tests that measure both similar and dissimilar constructs. The expectation was that the AAB would correlate with other measures of similar constructs (e.g., reading comprehension), and these correlations would be higher than those obtained from measures of constructs less closely related to the content of the AAB (e.g., processing speed). Demographic information about the concurrent validity samples can be found in Table 5.18.

**Table 5.15**  
**Test-Retest Reliability Coefficients for AAB Subtests and Composites**

<b>Subtest/composite</b>	<i>n</i>	<i>r</i>	<b>First administration</b>		<b>Second administration</b>		<b>Mean difference</b>
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Reading Foundational Skills	23	.90	114.13	15.70	116.22	14.17	2.09
Letter/Word Reading	147	.89	98.84	18.39	100.65	18.34	1.81
Reading Fluency	147	.91	98.00	17.54	100.44	17.68	2.44
<b>Basic Reading</b>	<b>147</b>	<b>.93</b>	<b>100.31</b>	<b>17.32</b>	<b>102.57</b>	<b>17.26</b>	<b>2.27</b>
Reading Comprehension: Words and Sentences	147	.74	115.97	19.04	113.91	16.37	2.05
Reading Comprehension: Passages	142	.81	100.33	13.02	101.96	12.47	1.63
<b>Reading Comprehension</b>	<b>147</b>	<b>.79</b>	<b>110.62</b>	<b>14.39</b>	<b>110.18</b>	<b>12.92</b>	<b>0.44</b>
Listening Comprehension: Words and Sentences	147	.75	98.55	14.01	101.03	14.92	2.48
Listening Comprehension: Passages	147	.78	101.41	14.18	105.95	13.22	4.53
<b>Listening Comprehension</b>	<b>147</b>	<b>.79</b>	<b>100.06</b>	<b>13.80</b>	<b>104.16</b>	<b>14.97</b>	<b>4.10</b>
Oral Fluency	147	.79	100.41	15.19	103.92	15.49	3.50
Oral Expression	147	.79	101.19	14.44	103.91	14.17	2.72
Oral Production	147	.80	103.21	13.77	106.94	13.00	3.73
<b>Expressive Communication</b>	<b>147</b>	<b>.85</b>	<b>101.86</b>	<b>14.29</b>	<b>106.52</b>	<b>14.71</b>	<b>4.66</b>
Pre-Writing Skills	23	.74	102.04	14.91	102.17	13.18	0.13
Spelling	147	.95	98.03	17.79	99.85	17.94	1.82
Written Composition	127	.83	104.01	14.58	102.32	14.96	1.69
<b>Written Expression</b>	<b>147</b>	<b>.90</b>	<b>102.21</b>	<b>14.73</b>	<b>102.37</b>	<b>15.25</b>	<b>0.16</b>
<b>Mathematical Calculation</b>	<b>147</b>	<b>.92</b>	<b>98.73</b>	<b>15.80</b>	<b>100.87</b>	<b>15.88</b>	<b>2.14</b>
<b>Mathematical Reasoning</b>	<b>147</b>	<b>.83</b>	<b>98.78</b>	<b>14.63</b>	<b>101.88</b>	<b>15.19</b>	<b>3.11</b>
<b>Academic Achievement Battery</b>	<b>147</b>	<b>.95</b>	<b>102.07</b>	<b>15.37</b>	<b>105.44</b>	<b>16.02</b>	<b>3.37</b>

Note. All correlations are significant at the  $p < .01$  level. Correlations were corrected for attenuation (Thorndike, 1949).



**Correlations With Other Achievement Measures**

*Wechsler Individual Achievement Test, Third Edition.* The Wechsler Individual Achievement Test, Third Edition (WIAT-III; Wechsler, 2009) is a comprehensive achievement test for individuals ages 4 to 50 years. It includes 15 subtests that make up seven composite measures of achievement: oral language, basic reading, total reading, reading comprehension and fluency, written expression, mathematics, and math fluency. Table 5.19 presents the correlations, means, and standard deviations between AAB scores and WIAT-III scores. Overall, the Academic Achievement Battery Composite shows a strong positive

correlation of .78 to WIAT-III Total Achievement score. As expected, similar subtests and composites showed moderate to strong positive correlations, including the correlations between the two basic reading composites ( $r = .74$ ), the spelling subtests ( $r = .88$ ), the word reading subtests ( $r = .77$ ), the reading comprehension composites ( $r = .77$ ), the math calculation/operations subtests ( $r = .77$ ), and the mathematical reasoning/mathematical problem solving subtests ( $r = .66$ ).

*Kaufman Test of Educational Achievement, Second Edition.* The Kaufman Test of Educational Achievement, Second

**Table 5.16**  
**Inter-Scorer Reliability of the**  
**Pre-Writing Skills Subtest**

Item	Intraclass correlation coefficient (ICC)
Figure 1	.87
Figure 2	.79
Figure 3	.96
Figure 4	.64
Figure 5	.73
Figure 6	.82
Figure 7	.78
<b>Total</b>	<b>.89</b>

Note.  $N = 20$ . To calculate the ICC, a two-way random effects model (consistency type) was used.

**Table 5.17**  
**Inter-Scorer Reliability of the**  
**Written Composition Subtest**

Criterion	Intraclass correlation coefficient (ICC)
Main idea	.78
Organization	.90
Voice	.81
Word choice	.87
Sentence fluency	.86
Conventions	.95
Presentation	.86
<b>Total</b>	<b>.97</b>

Note.  $N = 20$ . To calculate the ICC, a two-way random effects model (consistency type) was used.

**Table 5.18**  
**Demographic Characteristics of the AAB Concurrent Validity Samples**

Characteristic	WIAT-III	KTEA-II	WJ-III	WRAT4	WISC-IV	WAIS-IV
<i>n</i>	24	38	50	52	75	100
<b>Gender (%)</b>						
Male	58.3	50.0	52.0	48.1	49.3	41.0
Female	41.7	50.0	48.0	51.9	50.7	59.0
<b>Age (years)</b>						
<i>M</i>	10.6	15.1	27.0	27.8	10.2	32.1
<i>SD</i>	4.6	6.2	19.6	18.9	4.0	16.7
Range	4-18	4-25	4-71	5-70	6-32	16-81
<b>Race/ethnicity (%)</b>						
Caucasian	66.7	63.5	50.0	65.4	46.7	70.0
African American	4.2	2.6	20.0	1.9	12.0	8.0
Hispanic	29.2	31.6	28.0	26.9	32.0	18.0
Other	0.0	2.6	2.0	5.8	9.3	4.0
<b>Education level (%)</b>						
<12 years	37.5	34.2	24.0	17.3	24.0	5.0
12 years	25.0	31.6	36.0	48.1	37.3	27.0
13-15 years	16.7	18.4	16.0	17.3	25.3	27.0
16+ years	20.8	15.8	24.0	17.3	13.4	41.0

Note. WIAT-III = Wechsler Individual Achievement Test, Third Ed. (Wechsler, 2009); KTEA-II = Kaufman Test of Educational Achievement, Second Ed. (Kaufman & Kaufman, 2004); WJ-III = Woodcock-Johnson Tests of Achievement, Third Ed. (Woodcock, McGrew, & Mather, 2007); WRAT4 = Wide Range Achievement Test, 4 (Wilkinson & Robertson, 2006); WISC-IV = Wechsler Intelligence Scale for Children, Fourth Ed. (Wechsler, 2003); WAIS-IV = Wechsler Adult Intelligence Scale, Fourth Ed. (Wechsler, 2008). Parent education level is used for individuals ages 4 to 21 years.

**Table 5.19**  
**Correlations Between AAB Subtests and Composites and WIAT-III Subtests and Composites**

AAB subtest/composite	WIAT-III subtest/composite										
	Listening Comprehension	Oral Expression	Oral Language Composite	Reading Comprehension	Word Reading	Pseudoword Decoding	Oral Reading Fluency	Basic Reading Composite	Total Reading Composite	Reading Comprehension and Fluency Composite	Alphabet Writing Fluency
Reading Foundational Skills	—	—	—	—	—	—	—	—	—	—	—
Letter/Word Reading	.38	.58**	.18	.77**	.78**	.31	.84**	.43	.27	—	
Reading Fluency	.37	.43*	.08	.39	.38	.48*	.41	.18	.27	—	
<b>Basic Reading</b>	<b>.47*</b>	<b>.52**</b>	<b>.60**</b>	<b>.71**</b>	<b>.66**</b>	<b>.43</b>	<b>.74**</b>	<b>.39</b>	<b>.34</b>	—	
Reading Comprehension: Words and Sentences	.46*	.20	.65**	.67**	.62**	.42	.71**	.81**	.73**	—	
Reading Comprehension: Passages	.48*	.32	.53*	.56*	.54*	.47*	.59*	.51*	.54*	—	
<b>Reading Comprehension</b>	<b>.49*</b>	<b>.29</b>	<b>.73**</b>	<b>.75**</b>	<b>.71**</b>	<b>.55*</b>	<b>.79**</b>	<b>.79**</b>	<b>.77**</b>	—	
Listening Comprehension: Words and Sentences	.73**	.14	.57**	.69**	.39	.19	.57*	.62**	.54*	—	
Listening Comprehension: Passages	.59**	.13	.59**	.46	.58*	.23	.54*	.62**	.69**	—	
<b>Listening Comprehension</b>	<b>.77**</b>	<b>.16</b>	<b>.66**</b>	<b>.70**</b>	<b>.56*</b>	<b>.25</b>	<b>.67**</b>	<b>.74**</b>	<b>.71**</b>	—	
Oral Fluency	-.34	.26	-.04	-.12	.05	-.04	-.06	-.29	-.23	—	
Oral Expression	.80**	.23	.68**	.74**	.67**	.46	.76**	.73**	.73**	—	
Oral Production	.33	.36	.40	.03	.20	.07	.11	-.03	.03	—	
<b>Expressive Communication</b>	<b>.49*</b>	<b>.43*</b>	<b>.58**</b>	<b>.41</b>	<b>.53*</b>	<b>.30</b>	<b>.48*</b>	<b>.27</b>	<b>.33</b>	—	
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—	
Spelling	.33	.58**	.52*	.65**	.81**	.28	.75**	.42	.26	—	
Writing Composition	.35	.57*	.56*	.51*	.40	.43	.49*	.47*	.40	—	
<b>Written Expression</b>	<b>.31</b>	<b>.63**</b>	<b>.57**</b>	<b>.58*</b>	<b>.62**</b>	<b>.41</b>	<b>.64**</b>	<b>.47*</b>	<b>.36</b>	—	
Mathematical Calculation	.15	.25	.27	.39	.56*	.39	.49*	.51*	.47*	—	
Mathematical Reasoning	.53**	.44*	.59**	.70**	.59**	.18	.67**	.46	.39	—	
Academic Achievement Battery	.65**	.54**	.78**	.81**	.82**	.50*	.86**	.70**	.65**	—	
<i>M</i>	109.33	105.83	109.52	110.95	104.39	100.72	102.17	101.94	103.39	107.44	96.50
<i>SD</i>	15.85	13.73	13.07	23.71	10.28	7.07	13.41	9.04	14.67	17.33	10.54

(continued)

**Table 5.19 (continued)**  
**Correlations Between AAB Subtests and Composites and WIAT-III Subtests and Composites**

	WIAT-III subtest/composite											
<b>AAB subtest/composite</b>	Sentence Composition	Essay Composition	Spelling	Written Expression Composite	Math Problem Solving	Numerical Operations	Mathematics Composite	Math Fluency Addition	Math Fluency Subtraction	Math Fluency Multiplication	Total Achievement	
Reading Foundational Skills	-.14	-.02	.73**	.37	-.39	-.30	.28	-.10	.13	-.16	-.08	.51*
Letter/Word Reading	.09	-.23	.52*	.12	.57**	.22	.47	.15	.13	-.13	.04	.41*
Reading Fluency	.12	-.22	.62**	.19	.50*	.08	.32	-.02	-.04	-.38	-.20	.52**
<b>Basic Reading</b>	.60*	.25	.12	.46	.23	.38	.55*	-.24	-.30	-.33	-.34	.46*
Reading Comprehension: Words and Sentences	.41	.09	.59**	.48*	.62**	.33	.60**	.03	.06	.00	.03	.60**
Reading Comprehension: Passages	.61*	.20	.46	.58*	.38	.43	.70**	-.12	-.14	-.19	-.18	.53**
<b>Reading Comprehension</b>	.53	.21	.04	.38	.56**	.18	.41	-.41	-.29	-.50*	-.50*	.64**
Listening Comprehension: Words and Sentences	.71*	.32	.25	.60**	.63**	.42	.70**	-.14	-.16	-.12	-.16	.63**
Listening Comprehension: Passages	.71*	.30	.16	.55*	.67**	.33	.63**	-.35	-.28	-.42	-.42	.73**
<b>Listening Comprehension</b>	-.11	-.21	.33	-.04	.10	.22	.26	.58*	.23	.29	.44	-.16
Oral Fluency	.45	.03	.46	.41	.80**	.30	.70**	-.30	-.39	-.44	-.44	.73**
Oral Expression	.28	.33	.05	.34	.36	.11	.07	.23	.30	.03	.20	.39
Oral Production	.31	.00	.52*	.35	.74**	.37	.64**	.26	.01	-.09	.07	.57**
<b>Expressive Communication</b>	-.21	-.05	.88**	.44	.45*	.34	.35	.07	.16	-.14	.01	.51*
Pre-Writing Skills	.50	-.03	.27	.30	.42	.08	.34	.04	-.08	-.24	-.12	.48*
Spelling	.43	.02	.62**	.45	.34	.25	.33	.09	.10	-.15	.01	.51*
Writing Composition	.39	.37	.31	.52*	.25	.77**	.65**	.25	.28	.13	.23	.44*
Written Expression	.30	-.11	.55*	.30	.66**	.35	.63**	.20	-.11	-.32	-.11	.59**
<b>Mathematical Calculation</b>	.57*	.13	.64**	.59**	.69**	.51*	.74**	.06	-.01	-.25	-.10	.78**
<b>Mathematical Reasoning</b>	M	116.33	103.44	100.67	108.78	104.92	100.89	105.33	90.78	97.72	97.50	106.92
<b>Academic Achievement Battery</b>	SD	11.66	17.98	13.04	13.20	16.01	7.84	10.90	14.85	10.30	16.50	13.24
												13.84

Note. WIAT-III = Wechsler Individual Achievement Test, Third Ed. (Wechsler, 2009). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills, Pre-Writing Skills, and Alphabet Writing Fluency subtests included fewer than 10 participants; these data are excluded from this analysis.

\* $p < .05$ . \*\* $p < .01$ .

Edition (KTEA-II; Kaufman & Kaufman, 2004) is a comprehensive achievement test for individuals ages 4 years, 6 months to 25 years. It includes 14 subtests that make up eight composite measures of achievement: reading, math, written language, oral language, sound-symbol, oral fluency, decoding, and reading fluency. Table 5.20 presents the correlations, means, and standard deviations between AAB scores and KTEA-II scores. Similar to the WIAT-III analysis, there is a strong positive correlation between the overall achievement score on the AAB and the KTEA-II Comprehensive Academic Composite ( $r = .78$ ). In addition, correlations between similar subtests and composites are also high in the expected direction, including the correlations between the reading composites ( $r = .73$ ), the mathematical reasoning composite/math concepts and applications subtest ( $r = .78$ ), and the writing composites ( $r = .85$ ).

*Woodcock-Johnson Tests of Achievement, Third Edition.* The Woodcock-Johnson Tests of Achievement, Third Edition (WJ-III; Woodcock, McGrew, & Mather, 2007) is a comprehensive achievement test for individuals ages 2 to 90+ years. The core test includes 13 subtests that address 13 clusters of achievement: broad reading, oral language, broad math, math calculation skills, broad written language, written expression, academic skills, academic fluency, academic applications, brief reading, brief math, brief writing, and brief achievement. Table 5.21 presents the correlations, means, and standard deviations between AAB scores and WJ-III scores. A strong positive correlation between the Academic Achievement Battery Composite and the WJ-III Total Achievement Cluster was found ( $r = .80$ ). Moderate to strong correlations in the expected direction were also found among subtests and composites measuring related skills, including reading ( $r = .70$ ), letter/word reading ( $r = .67$ ), spelling ( $r = .70$ ), math calculation ( $r = .65$ ), and written language ( $r = .70$ ).

*Wide Range Achievement Test 4.* The Wide Range Achievement Test 4 (WRAT4; Wilkinson & Robertson, 2006) is a screening achievement test for individuals ages 5 to 94 years. It includes four subtests (reading, sentence comprehension, spelling, and math computation) and one composite measure of reading. Table 5.22 presents the correlations, means, and standard deviations between AAB scores and WRAT4 scores. The AAB Basic Reading Composite and Reading Comprehension Composite both correlated strongly with the WRAT4 Reading Composite ( $r = .80$  and  $.72$ , respectively). The AAB Word Reading subtest and the WRAT4 Reading subtest were found to have a strong correlation ( $r = .86$ ). A similar pattern of correlations exists between the AAB Mathematical Calculation and Mathematical Reasoning composites and the WRAT4 Mathematical Computation subtest ( $r = .75$  and  $.54$ , respectively). Finally, there is a

strong positive relationship between the two measures of spelling ( $r = .85$ ).

### **Correlations With Intelligence Measures**

*Wechsler Intelligence Scale for Children, Fourth Edition.* The Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003) is a comprehensive intelligence test for children ages 6 to 16 years. The core test includes 10 subtests that make up five composite measures of intelligence: verbal comprehension, perceptual reasoning, working memory, processing speed, and a total composite. Table 5.23 presents the correlations, means, and standard deviations between AAB scores and WISC-IV scores. The Full Scale Composite of the WISC-IV exhibited a strong positive correlation with the Academic Achievement Battery Composite ( $r = .71$ ). The Verbal Comprehension Composite of the WISC-IV exhibited the strongest relationships with the AAB Basic Reading ( $r = .50$ ), Listening Comprehension ( $r = .57$ ), and Expressive Communication ( $r = .56$ ) composites. Conversely, Processing Speed, a composite based on performance on a group of tasks most dissimilar to the content of the AAB, showed weak correlations throughout, the strongest of which was with the Expressive Communication ( $r = .30$ ) and Mathematical Reasoning ( $r = .28$ ) composites.

*Wechsler Adult Intelligence Scale, Fourth Edition.* The Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV; Wechsler, 2008) is a comprehensive intelligence test for individuals ages 16 to 90 years. Similar to the WISC-IV, the WAIS-IV includes 10 subtests that make up six composite measures of intelligence: verbal comprehension, perceptual reasoning, working memory, processing speed, general ability, and a total composite. Table 5.24 presents the correlations, means, and standard deviations between AAB scores and WAIS-IV scores. Correlations exhibit a similar pattern to those found with the WISC-IV. There is a strong positive correlation between the two overall test scores ( $r = .71$ ) as well as moderately strong relationships between the WAIS-IV Verbal Comprehension Composite and many AAB composites, with correlations ranging from  $.45$  (Reading Comprehension) to  $.53$  (Basic Reading, Listening Comprehension). Like the WISC-IV, there are weak relationships found between the Processing Speed Composite and the AAB composites, as they measure mostly dissimilar skills, with Expressive Communication again exhibiting the strongest relationship ( $r = .38$ ).

### **Criterion Validity**

Criterion validity can be defined as the extent to which a test can predict performance in real-life situations or distinguish individuals with different clinical attributes (American Educational Research Association,

**Table 5.20**  
**Correlations Between AAB Subtests and Composites and KTEA-II Subtests and Composites**

	KTEA-II subtest/composite										
	Letter & Word Recognition	Reading Comprehension	Math Composite	Math Concepts & Applications	Math Computation	Math Composite	Written Expression	Spelling	Written Language Composite	Listening Comprehension	Oral Expression
<b>AAB subtest/composite</b>											
Reading Foundational Skills	—	—	—	—	—	—	—	—	—	—	—
Word Reading	.49**	.74**	.50**	.31	.43*	.22	.62**	.54**	.32	.32*	.32*
Reading Fluency	.27	.39*	.41*	.23	.25	.29	.28	.37*	.16	.59**	.59**
Basic Reading	.56**	.73**	.52**	.37*	.47**	.37*	.58**	.57**	.40*	.54**	.54**
Reading Comprehension: Words and Sentences	.67**	.71**	.66**	.53**	.65**	.36*	.54**	.48**	.39*	.37*	.37*
Reading Comprehension: Passages	.54**	.46**	.39*	.31	.38*	.38*	.47**	.47**	.29	.43*	.43*
Reading Comprehension	.67**	.61**	.59**	.47**	.58**	.40*	.56**	.53**	.38*	.44**	.44**
Listening Comprehension: Words and Sentences	.32	.40*	.36*	.14	.24	-.10	.32	.14	.16	.26	.26
Listening Comprehension: Passages	.19	.20	.15	.24	.19	.20	-.09	.12	.51**	.03	.03
Listening Comprehension	.35*	.42*	.36*	.27	.30	.07	.16	.18	.45**	.21	.21
Oral Fluency	.16	.12	.23	.10	.18	.27	.36*	.35*	.16	.32	.32
Oral Expression	.47**	.62**	.62**	.60**	.68**	.38*	.59**	.57**	.26	.49**	.49**
Oral Production	.25	.23	.28	.27	.28	.25	.25	.32	.33*	.16	.16
Expressive Communication	.41*	.42*	.46**	.42*	.49**	.43**	.54**	.55**	.35*	.45**	.45**
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—	—
Spelling	.43**	.74**	.60**	.33	.49**	.47**	.77**	.83**	.30	.51**	.51**
Writing Composition	.36*	.22	.30	.18	.22	.65**	.49**	.65**	.16	.56**	.56**
Written Expression	.56**	.51**	.54**	.33	.46**	.75**	.73**	.85**	.38*	.57**	.57**
Mathematical Calculation	.38*	.49**	.45**	.85**	.79**	.50**	.35*	.49**	.34*	.33*	.33*
Mathematical Reasoning	.31	.65**	.59**	.58**	.74**	.22	.40*	.37*	.27	.29	.29
Academic Achievement Battery	.67**	.75**	.79**	.68**	.78**	.58**	.67**	.72**	.54**	.55**	.55**
M	102.26	103.12	102.12	100.55	98.32	99.68	102.18	102.33	102.29	96.76	96.76
SD	10.84	15.29	14.16	14.13	13.46	13.85	13.97	15.97	10.39	14.05	14.05

(continued)

**Table 5.20 (continued)**  
**Correlations Between AAB Subtests and Composites and KTEA-II Subtests and Composites**

AAB subtest/composite	KTEA-II subtest/composite											
	Phonological Awareness	Sound-Symbol Decoding	Associational Fluency	Naming Facility	Oral Fluency Composite	Decoding Composite	Word Recognition Fluency	Decoding Fluency	Reading Fluency Composite	Comprehensive Achievement Composite		
Reading Foundational Skills	—	—	—	—	—	—	—	—	—	—		
Letter/Word Reading	.38*	—	.20	.12	.14	.75**	.52**	.77**	.68**	.40*		
Reading Fluency	.48**	—	.13	.26	.22	.35*	.33	.30	.36*	.27		
Basic Reading	.57**	—	.26	.27	.29	.69**	.54**	.67**	.66**	.52**		
Reading Comprehension: Words and Sentences	.44**	—	.38*	.55**	.56**	.66**	.64**	.69**	.69**	.64**		
Reading Comprehension: Passages	.43*	—	.23	.47**	.41*	.42*	.69**	.55**	.59**	.48**		
Reading Comprehension	.48**	—	.34*	.58**	.55**	.60**	.74**	.69**	.72**	.62**		
Listening Comprehension: Words and Sentences	.25	—	.25	.17	.20	.60**	.22	.49**	.44*	.16		
Listening Comprehension: Passages	.28	—	.04	-.24	-.14	-.08	-.04	.12	-.07	.28		
Listening Comprehension	.37*	—	.20	-.04	.05	.36*	.12	.43*	.26	.30		
Oral Fluency	.29	—	.47**	.09	.32	.30	.31	.27	.32	.18		
Oral Expression	.46**	—	.47**	.45**	.54**	.75**	.58**	.63**	.71**	.55**		
Oral Production	.27	—	.07	.14	.11	.09	.30	.32	.20	.26		
Expressive Communication	.48**	—	.49**	.32	.46**	.51**	.53**	.54**	.55**	.46**		
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—		
Spelling	.51**	—	.30	.22	.25	.81**	.63**	.80**	.77**	.47**		
Writing Composition	.46**	—	.27	.23	.27	.37*	.51**	.36*	.47**	.39*		
Written Expression	.59**	—	.42**	.34*	.42**	.66**	.65**	.65**	.69**	.63**		
Mathematical Calculation	.40*	—	.20	.22	.28	.35*	.37*	.33	.38*	.64**		
Mathematical Reasoning	.35*	—	.20	.24	.26	.47**	.39*	.39*	.46**	.51**		
Academic Achievement Battery	.65**	—	.44**	.39*	.48**	.72**	.67**	.73**	.74**	.78**		
M	98.87	105.44	103.24	106.88	104.21	100.00	102.14	101.97	103.33	102.27	102.48	102.18
SD	11.81	10.27	10.12	10.55	11.92	11.93	12.43	11.22	10.91	10.60	10.96	13.86

Note. KTEA-II = Kaufman Test of Educational Achievement, Second Ed. (Kaufman & Kaufman, 2004). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills subtest, Pre-Writing Skills subtest, Phonological Awareness subtest, and Sound-Symbol Composite included fewer than 10 participants; these data are excluded from this analysis.

\* $p < .05$ . \*\* $p < .01$ .



**Table 5.21**  
**Correlations Between AAB Subtests and Composites and WJ-III Subtests and Clusters**

AAB subtest/composite	WJ-III subtest/cluster											
	Letter-Word Identification	Reading Fluency	Passage Comprehension	Broad Reading Cluster	Story Recall	Understanding Directions	Oral Language Cluster (Standard)	Calculation	Math Fluency	Applied Problems	Broad Math Cluster	Math Calculation Skills Cluster
Reading Foundational Skills	—	—	—	—	—	—	—	—	—	—	—	—
Letter/Word Reading	.67**	.17	.55**	.60**	.12	.45**	.39**	.50**	.29	.64**	.56**	.39**
Reading Fluency	.33*	.66**	.34*	.54**	.04	.26	.18	.47**	.47**	.32*	.48**	.49**
Basic Reading	.65**	.44**	.57**	.70**	.12	.50**	.41**	.53**	.42**	.57**	.58**	.47**
Reading Comprehension: Words and Sentences	.56**	.32*	.53**	.56**	.40**	.33*	.48**	.46**	.23	.46**	.41**	.37*
Reading Comprehension: Passages	.18	.28	.32*	.37*	.22	-.03	.11	.33*	.27	.19	.36*	.39**
Reading Comprehension	.45**	.34*	.50**	.54**	.37**	.21	.37**	.46**	.29*	.40**	.45**	.43**
Listening Comprehension: Words and Sentences	.48**	.05	.54**	.44**	.46**	.22	.43**	.26	-.11	.37**	.15	.06
Listening Comprehension: Passages	.20	.00	.34*	.24	.48**	.24	.44**	.26	.03	.17	.20	.16
Listening Comprehension	.41**	.03	.53**	.41**	.56**	.27	.52**	.31*	-.05	.33*	.21	.13
Oral Fluency	.38**	.53**	.22	.48**	-.23	.42**	.14	.28	.27	.35*	.29*	.24
Oral Expression	.48**	.17	.63**	.56**	.47**	.32*	.51**	.37**	.04	.43**	.32*	.21
Oral Production	.44**	.30*	.25	.46**	.13	.27	.26	.24	.06	.21	.20	.19
Expressive Communication	.60**	.47**	.52**	.70**	.17	.47**	.42**	.41**	.18	.47**	.38**	.30*
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—	—	—
Spelling	.60**	.37*	.45**	.62**	.08	.29*	.25	.34*	.36*	.59**	.50**	.32*
Writing Composition	.21	.28	.30*	.42**	.05	.19	.15	.18	.21	.19	.27	.31*
Written Expression	.61**	.43**	.54**	.70**	.11	.35*	.31*	.36*	.41**	.58**	.53**	.41**
Mathematical Calculation	.39**	.15	.45**	.41**	.26	.36*	.41**	.65**	.39**	.50**	.56**	.58**
Mathematical Reasoning	.71**	.45**	.62**	.76**	.36*	.61**	.64**	.69**	.46**	.67**	.65**	.61**
Academic Achievement Battery	.74**	.44**	.71**	.81**	.37**	.53**	.59**	.65**	.41**	.68**	.65**	.57**
M	100.70	96.57	104.40	99.92	105.18	100.56	102.80	105.13	99.85	100.16	102.14	103.19
SD	10.80	13.69	12.34	11.02	20.52	11.22	13.21	12.24	16.90	8.84	11.29	13.77

(continued)

**Table 5.21 (continued)**  
**Correlations Between AAB Subtests and Composites and WJ-III Subtests and Clusters**

AAB subtest/composite	WJ-III subtest/cluster														
	Spelling	Writing Fluency	Writing Samples	Broad Written Language Cluster	Written Expression Cluster	Story Recall-Delayed	Handwriting	Academic Skills Cluster	Academic Fluency Cluster	Brief Reading Cluster	Brief Math Cluster	Brief Writing Cluster	Total Achievement Cluster		
Reading Foundational Skills	—	—	—	—	—	—	—	—	—	—	—	—	—		
Letter/Word Reading	.60**	.26	.13	.43**	.27	.03	—	.74**	.26	.53**	.46**	.65**	.49**	.72**	.61**
Reading Fluency	.29*	.51**	.12	.41**	.44**	-.02	—	.45**	.63**	.29*	.26	.46**	.26	.37**	.55**
Basic Reading	.57**	.42**	.14	.51**	.40**	.03	—	.73**	.48**	.48**	.47**	.62**	.43**	.68**	.69**
Reading Comprehension:															
Words and Sentences	.26	.12	.34*	.30*	.32*	.25	—	.51**	.23	.52**	.44**	.50**	.33*	.49**	.48**
Reading Comprehension: Passages	.25	.08	.40**	.36*	.35*	.19	—	.28	.23	.42**	.03	.29*	.42**	.23	.40**
Reading Comprehension	.31*	.12	.43**	.38**	.38**	.25	—	.47**	.27	.54**	.30*	.47**	.43**	.43**	.51**
Listening Comprehension:															
Words and Sentences	.24	.01	.44**	.31*	.32*	.30*	—	.41**	-.03	.47**	.36*	.33*	.37**	.40**	.35*
Listening Comprehension: Passages	.12	-.06	.70**	.35*	.46**	.34*	—	.21	-.04	.49**	.10	.23	.55**	.17	.28
Listening Comprehension	.22	-.02	.70**	.40**	.46**	.38**	—	.38**	-.04	.58**	.28*	.34*	.56**	.35*	.38**
Oral Fluency	.29*	.61**	-.16	.37**	.38**	-.28	—	.40**	.57**	.16	.38**	.36*	.08	.39**	.44**
Oral Expression	.30*	.04	.49**	.36*	.37**	.33*	—	.48**	.08	.62**	.39**	.46**	.52**	.46**	.49**
Oral Production	.16	.32*	.19	.33*	.38**	.02	—	.37**	.29	.32*	.26	.29*	.26	.34*	.39**
Expressive Communication	.35*	.46**	.24	.50**	.53**	.03	—	.58**	.44**	.52**	.48**	.52**	.40**	.55**	.62**
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spelling	.70**	.40**	.29*	.66**	.51**	-.04	—	.67**	.41**	.53**	.38**	.55**	.67**	.70**	.67**
Writing Composition	.26	.40**	.10	.40**	.39*	-.06	—	.23	.37*	.32*	.11	.21	.21	.26	.43**
Written Expression	.70**	.52**	.24	.70**	.58**	-.05	—	.66**	.52**	.57**	.39**	.55**	.60**	.70**	.73**
Mathematical Calculation	.28*	.19	.33*	.37*	.40**	.16	—	.50**	.26	.51**	.20	.61**	.36*	.43**	.49**
Mathematical Reasoning	.52**	.45**	.37*	.60**	.57**	.21	—	.77**	.49**	.66**	.51**	.72**	.55**	.71**	.75**
Academic Achievement Battery	.58**	.41**	.46**	.67**	.64**	.20	—	.79**	.47**	.74**	.51**	.73**	.64**	.75**	.80**
M	103.52	98.22	111.79	104.69	105.33	104.31	90.75	103.22	97.26	104.73	100.42	102.46	106.84	101.84	102.10
SD	11.25	18.54	19.84	12.55	14.50	18.86	8.88	11.18	16.90	13.14	17.51	11.30	12.51	11.11	11.62

Note. WJ-III = Woodcock-Johnson Tests of Achievement, Third Ed. (Woodcock, McGrew, & Mather, 2007). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills, Pre-Writing Skills, and Handwriting subtest analyses included fewer than 10 participants; these data are excluded from this analysis.

\* $p < .05$ . \*\* $p < .01$ .

**Table 5.22**  
**Correlations Between AAB Subtests and Composites and WRAT4 Subtests and Composites**

AAB subtest/composite	WRAT4 subtest/composite					
	Reading	Sentence Comprehension	Reading Composite	Spelling	Mathematical Computation	
Reading Foundational Skills	—	—	—	—	—	
Letter/Word Reading	.86**	.82**	.90**	.71**	.55**	
Reading Fluency	.51**	.40**	.46**	.55**	.30*	
Basic Reading	.80**	.71**	.80**	.73**	.47**	
Reading Comprehension: Words and Sentences	.58**	.65**	.67**	.36**	.50**	
Reading Comprehension: Passages	.63**	.63**	.66**	.42**	.48**	
Reading Comprehension	.66**	.69**	.72**	.42**	.54**	
Listening Comprehension: Words and Sentences	.68**	.68**	.73**	.49**	.37**	
Listening Comprehension: Passages	.60**	.57**	.63**	.57**	.43**	
Listening Comprehension	.79**	.77**	.83**	.65**	.50**	
Oral Fluency	.39**	.36*	.41**	.35*	.36**	
Oral Expression	.67**	.62**	.68**	.49**	.57**	
Oral Production	.44**	.54**	.55**	.41**	.32*	
Expressive Communication	.63**	.63**	.69**	.53**	.53**	
Pre-Writing Skills	—	—	—	—	—	
Spelling	.78**	.68**	.78**	.85**	.53**	
Writing Composition	.43**	.32*	.40**	.41**	.32*	
Written Expression	.75**	.62**	.72**	.80**	.54**	
Mathematical Calculation	.47**	.40**	.44**	.59**	.75**	
Mathematical Reasoning	.39**	.31*	.39**	.29*	.54**	
Academic Achievement Battery	.83**	.76**	.84**	.75**	.71**	
	<i>M</i>	99.79	100.32	99.96	101.29	100.94
	<i>SD</i>	13.92	16.20	15.61	15.43	12.86

Note. WRAT4 = Wide Range Achievement Test 4 (Wilkinson & Robertson, 2006). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills and Pre-Writing Skills subtest analyses included fewer than 10 participants; these data are excluded from this analysis.

\* $p < .05$ . \*\* $p < .01$ .

American Psychological Association, & National Council on Measurement in Education, 2014; Anastasi & Urbana, 1997). The AAB was administered to individuals in several different clinical groups, including individuals with specific learning disorder, intellectual developmental disorder, attention deficit/hyperactivity disorder (ADHD), and speech/language impairment. The performance of these groups was then compared to the performance of the AAB age-based sample of nonclinical individuals; the ability of the AAB to discriminate between these groups was analyzed. For each clinical group, the difference in mean performance was examined, and the effect size (Cohen's *d*; Cohen, 1988) is reported for each subtest and composite. Typically, a medium effect size ranges from .40 to .75, with large effects being greater than .75. Table 5.25 presents the demographic characteristics of the clinical samples.

### Specific Learning Disorder

The AAB was administered to 68 individuals with a specific learning disorder. Table 5.26 presents the mean AAB subtest and composite scores for this group. The largest subtest discrepancy between the normative sample and the specific learning disorder sample was on the

Reading Fluency subtest. The performance of the specific learning disorder sample was analyzed to find how scores fell within the seven clinically relevant standard score ranges compared to the percentages predicted from the normal curve (see Table 5.27). As indicated, approximately 2.7% of the distribution would typically obtain a score less than or equal to a standard score of 69. On average, 32.4% of the specific learning disorder sample obtained a score in this range across all AAB subtest and composite scores. These results help illustrate the ability of the AAB to identify individuals with suspected specific learning disorders.

### Intellectual Developmental Disorder

The AAB was administered to 63 individuals who had been identified as having an intellectual developmental disorder. Table 5.28 presents the mean AAB subtest and composite scores for this group. The range of discrepancies between the normative sample and the intellectual developmental disorder sample ranged from 22 to 50 standard score points. The performance of the intellectual developmental disorder sample was analyzed to find how scores fell within seven clinically relevant standard score ranges compared to the percent predicted

**Table 5.23**  
**Correlations Between AAB Subtests and Composites and WISC-IV Subtests and Composites**

AAB subtest/composite	WISC-IV subtest/composite													
	Similarities	Vocabulary	Comprehension	Block Design	Picture Concepts	Matrix Reasoning	Perceptual Reasoning Composite	Digit Span	Letter-Number Sequencing	Working Memory Composite	Coding	Symbol Search	Processing Speed Composite	Full Scale Composite
Reading Foundational Skills	.48**	.39*	.51**	.15	.17	.37*	.32	.28	.36*	.30	.00	.26	.00	.41*
Letter/Word Reading	.45**	.41**	.42**	.26*	.45**	.21	.44**	.23	.18	.25*	-.01	.13	.06	.42**
Reading Fluency	.42**	.32**	.37**	.26*	.20	.12	.27*	.20	.27	.26*	.11	.16	.15	.38**
Basic Reading	.46**	.45**	.43**	.31**	.35**	.22	.41**	.28*	.22	.28*	.12	.12	.09	.45**
Reading Comprehension: Words and Sentences	.32**	.45**	.20	.38**	.30**	.20	.37**	.20	.20	.26*	.13	-.01	.05	.36**
Reading Comprehension: Passages	.34**	.32**	.35**	.24*	.43**	.12	.37**	.15	.14	.18	.08	.33**	.17	.40**
Reading Comprehension	.41**	.47**	.33**	.34**	.45**	.19	.45**	.21	.21	.26*	.13	.19	.14	.47**
Listening Comprehension: Words and Sentences	.33**	.46**	.33**	.31**	.34**	.31**	.44**	.19	.18	.26*	.23*	.09	.20	.45**
Listening Comprehension: Passages	.41**	.43**	.44**	.16	.28*	.13	.28*	.26*	.29*	.30*	.05	.27*	.17	.42**
Listening Comprehension	.48**	.58**	.51**	.23**	.40**	.27*	.46**	.30*	.30*	.36**	.17	.24*	.24*	.56**
Oral Fluency	.26*	.16	.33**	.24*	.12	.16	.21	.06	.25	.16	.33**	.31**	.29*	.34**
Oral Expression	.61**	.57**	.65**	.31**	.36**	.08	.36**	.28*	.33*	.36**	.10	.22	.18	.55**
Oral Production	.27*	.23*	.34**	.23*	.17	.12	.23*	.42**	.33*	.43**	.28*	.18	.20	.39**
Expressive Communication	.52**	.44**	.60**	.35**	.29*	.16	.36**	.33**	.41*	.43**	.32**	.32**	.30**	.58**
Pre-Writing Skills	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spelling	.43**	.33**	.43**	.25*	.47**	.22	.44**	.22	.26	.27*	.14	.24*	.21	.45**
Writing Composition	.40**	.46**	.53**	.09	.17	.32*	.22	.25	.41*	.36*	.34*	.16	.27	.45**
Written Expression	.27*	.20	.35**	.30**	.34**	.15	.26*	.28*	.21	.26*	.27*	.12	.13	.33**
Mathematical Calculation	.45**	.25*	.37**	.28*	.23*	.30*	.36**	.40**	.45*	.50**	.25*	.25*	.18	.48**
Mathematical Reasoning	.47**	.47**	.50**	.36**	.33**	.34**	.47**	.45**	.41*	.54**	.26*	.23*	.28*	.59**
Academic Achievement Battery	.63**	.57**	.63**	.41**	.49**	.32**	.56**	.47**	.46*	.55**	.31**	.31**	.28*	.71**
M	10.19	9.63	9.51	98.45	10.07	10.12	10.75	101.95	9.71	9.85	97.75	10.33	10.59	101.67
SD	2.57	2.54	2.26	12.48	2.81	2.82	2.07	11.74	2.19	1.94	9.71	3.14	3.63	18.77
														12.63

Note. WISC-IV = Wechsler Intelligence Scale for Children, Fourth Ed. (Wechsler, 2003). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills and Pre-Writing Skills subtests analyses included too few participants; these data are excluded from this analysis.

\* $p < .05$ . \*\* $p < .01$ .

**Table 5.24**  
**Correlations Between AAB Subtests and Composites and WAIS-IV Subtests and Composites**

AAB subtest/composite	WAIS-IV subtest/composite															
	Similarities	Vocabulary	Information	Verbal Comprehension Composite	Block Design	Matrix Reasoning	Visual Puzzles	Perceptual Reasoning Composite	Arithmetic	Digit-Span	Working Memory Composite	Symbol Search	Coding	Processing Speed Composite	General Ability Composite	Full Scale Composite
Letter/Word Reading	.49**	.60**	.47**	.62**	.11	.16	.10	.45**	.47**	.43**	.54**	.12	-.03	.25*	.62**	.63**
Reading Fluency	.23*	.29**	.19	.28**	.20	.22*	.21*	.28**	.21*	.13	.25*	.07	.06	.22*	.32**	.35**
Basic Reading	.43**	.53**	.39**	.53**	.17	.21*	.17	.43**	.40**	.33**	.47**	.12	.02	.27**	.56**	.57**
Reading Comprehension: Words and Sentences	.23*	.45**	.29**	.37**	.01	.03	.02	.26**	.26**	.13	.28**	.21*	.14	.34**	.37**	.42**
Reading Comprehension: Passages	.36**	.42**	.16	.38**	.02	.00	-.03	.10	.15	.18	.22*	.11	.06	.16	.27**	.29**
Reading Comprehension	.35**	.51**	.26*	.45**	.02	.01	-.01	.20*	.24*	.18	.29**	.18	.11	.28**	.37**	.41**
Listening Comprehension: Words and Sentences	.36**	.48**	.36**	.49**	-.05	.05	-.01	.29**	.25*	.11	.26**	.07	-.04	.12	.45**	.41**
Listening Comprehension: Passages	.29**	.33**	.31**	.37**	.16	.18	.17	.37**	.40**	.21*	.36**	.06	-.07	.05	.43**	.41**
Listening Comprehension	.40**	.50**	.42**	.53**	.08	.15	.11	.41**	.41**	.20*	.39**	.07	-.07	.10	.55**	.51**
Oral Fluency	.11	.12	.18	.16	.04	.03	-.03	-.05	-.02	-.02	.03	.12	.12	.23*	.07	.12
Oral Expression	.50**	.58**	.48**	.62**	.20*	.28**	.21*	.44**	.45**	.33**	.47**	.18	.06	.23*	.63**	.61**
Oral Production	.24*	.34**	.26**	.34**	.12	.08	.07	.09	.02	.03	.02	.25*	.14	.40**	.25*	.29**
Expressive Communication	.36**	.45**	.39**	.48**	.15	.16	.10	.20*	.18	.14	.20*	.24*	.14	.38**	.40**	.43**
Spelling	.44**	.55**	.37**	.54**	-.03	.01	-.03	.24*	.38**	.28**	.45**	.02	-.01	.17	.46**	.48**
Writing Composition	.12	.23*	.24*	.23*	.10	.16	.12	.10	.20*	.07	.13	-.03	-.03	.01	.19	.18
Written Expression	.36**	.50**	.38**	.49**	.03	.10	.04	.22*	.36**	.23*	.38**	-.01	-.03	.12	.42**	.43**
Mathematical Calculation	.30**	.40**	.48**	.47**	.30**	.33**	.29**	.57**	.66**	.34**	.66**	.04	-.01	.26**	.62**	.66**
Mathematical Reasoning	.31**	.45**	.46**	.48**	.27**	.27**	.26**	.57**	.61**	.33**	.66**	.05	-.03	.29**	.62**	.67**
Academic Achievement Battery	.48**	.64**	.54**	.66**	.19	.23*	.18	.50**	.55**	.34**	.58**	.14	.03	.33**	.68**	.71**
M	11.04	11.32	10.69	105.49	11.41	11.61	11.51	104.56	10.79	10.28	102.21	11.36	12.70	104.72	105.61	105.32
SD	2.91	3.08	2.78	13.90	7.91	7.26	8.01	14.73	2.75	3.10	12.89	5.30	11.09	13.25	13.74	12.92

Note. WAIS-IV = Wechsler Adult Intelligence Scale, Fourth Ed. (Wechsler, 2008). Sample size varies due to differing grade start points for each subtest. The Reading Foundational Skills and Pre-Writing Skills subtests were not administered to this group due to age.

\* $p < .05$ . \*\* $p < .01$ .

**Table 5.25**  
**Demographic Characteristics of the AAB Clinical Samples**

<b>Characteristic</b>	<b>Specific learning disorder</b>	<b>Intellectual developmental disorder</b>	<b>Attention deficit/hyperactivity disorder</b>	<b>Speech/language impairment</b>
<i>n</i>	68	63	62	33
<b>Gender (%)</b>				
Male	57.4	55.6	51.6	66.7
Female	42.6	44.4	48.4	33.3
<b>Age (years)</b>				
<i>M</i>	19.3	23.9	21.2	10.6
<i>SD</i>	10.9	13.3	12.0	4.1
Range	7-51	7-59	5-49	4-16
<b>Race/ethnicity (%)</b>				
Caucasian	39.7	42.9	64.5	33.3
African American	27.9	27.0	17.7	24.2
Hispanic	26.5	27.0	8.1	33.3
Other	5.9	3.2	9.7	9.1
<b>Education level (%)</b>				
<12 years	16.2	28.6	4.8	21.2
12 years	45.6	57.1	27.4	24.2
13-15 years	19.1	6.3	17.7	9.1
16+ years	19.1	7.9	50	45.5

Note. Parent education level is used for individuals ages 4 to 21 years. Percentages may not sum to 100% due to rounding.

**Table 5.26**  
**Mean AAB Standard Scores for the Specific Learning Disorder Sample and the Age-Based Normative Sample**

<b>Subtest/composite</b>	<b>Specific learning disorder</b>		<b>Normative</b>		<b>Mean difference</b>	<b>Effect size</b>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Reading Foundational Skills	—	—	—	—	—	—
Letter/Word Reading	77.64	21.71	98.72	16.55	-21.09	1.25
Reading Fluency	75.98	24.97	99.13	15.43	-23.14	1.44
<b>Basic Reading</b>	<b>75.55</b>	<b>23.81</b>	<b>100.00</b>	<b>15.00</b>	<b>-24.46</b>	<b>1.57</b>
Reading Comprehension: Words and Sentences	83.60	21.69	100.17	14.82	-16.57	1.09
Reading Comprehension: Passages	83.31	13.60	98.69	14.08	-15.38	1.09
<b>Reading Comprehension</b>	<b>82.47</b>	<b>18.37</b>	<b>100.07</b>	<b>14.50</b>	<b>-17.60</b>	<b>1.20</b>
Listening Comprehension: Words and Sentences	84.75	20.01	99.67	15.32	-14.92	0.96
Listening Comprehension: Passages	80.11	20.11	100.39	15.22	-20.28	1.31
<b>Listening Comprehension</b>	<b>78.62</b>	<b>20.61</b>	<b>100.10</b>	<b>14.82</b>	<b>-21.48</b>	<b>1.42</b>
Oral Fluency	87.86	13.71	100.63	15.44	-12.77	0.83
Oral Expression	80.19	18.74	99.69	14.77	-19.49	1.30
Oral Production	91.63	17.23	100.29	15.16	-8.66	0.57
<b>Expressive Communication</b>	<b>81.01</b>	<b>18.34</b>	<b>100.00</b>	<b>15.00</b>	<b>-18.99</b>	<b>1.25</b>
Pre-Writing Skills	—	—	—	—	—	—
Spelling	75.92	19.29	98.77	16.88	-22.85	1.36
Written Composition	82.76	19.45	98.87	16.03	-16.11	0.99
<b>Written Expression</b>	<b>77.69</b>	<b>20.63</b>	<b>100.00</b>	<b>15.01</b>	<b>-22.31</b>	<b>1.46</b>
<b>Mathematical Calculation</b>	<b>78.50</b>	<b>18.22</b>	<b>100.49</b>	<b>15.19</b>	<b>-21.99</b>	<b>1.43</b>
<b>Mathematical Reasoning</b>	<b>81.45</b>	<b>16.98</b>	<b>101.52</b>	<b>14.19</b>	<b>-20.06</b>	<b>1.40</b>
<b>Academic Achievement Battery</b>	<b>71.99</b>	<b>19.20</b>	<b>100.00</b>	<b>14.98</b>	<b>-28.01</b>	<b>1.84</b>

Note. The Reading Foundational Skills and Pre-Writing Skills subtests were not administered to this group due to age.



**Table 5.27**  
**Predicted and Actual Percentages of the Specific Learning Disorder Sample Scoring**  
**Within Seven Clinically Relevant Standard Score Ranges on AAB Subtests and Composites**

	Range of performance						
	Significantly below average	Moderately below average	Below average	Average	Above average	Moderately above average	Significantly above average
Standard score range	≤69	70-79	80-89	90-109	110-119	120-129	≥130
% predicted from normal distribution	2.7	7.6	17.1	49.4	15.1	6.2	1.9
<b>Subtest/composite</b>							
Reading Foundational Skills	—	—	—	—	—	—	—
Letter/Word Reading	37.8	21.9	17.9	13.6	5.2	0.7	2.9
Reading Fluency	47.3	5.2	15.1	20.0	7.2	1.3	4.0
<b>Basic Reading</b>	<b>44.0</b>	<b>15.5</b>	<b>10.8</b>	<b>19.9</b>	<b>5.8</b>	<b>0.0</b>	<b>4.0</b>
Reading Comprehension: Words and Sentences	34.1	4.3	21.0	27.0	13.5	0.0	0.0
Reading Comprehension: Passages	0.0	61.6	11.2	18.6	8.5	0.0	0.0
<b>Reading Comprehension</b>	<b>32.4</b>	<b>20.9</b>	<b>11.9</b>	<b>22.7</b>	<b>12.1</b>	<b>0.0</b>	<b>0.0</b>
Listening Comprehension: Words and Sentences	28.2	15.7	12.0	29.6	9.7	4.8	0.0
Listening Comprehension: Passages	32.4	9.5	17.9	36.6	2.4	1.2	0.0
<b>Listening Comprehension</b>	<b>34.7</b>	<b>17.8</b>	<b>12.9</b>	<b>29.9</b>	<b>4.7</b>	<b>0.0</b>	<b>0.0</b>
Oral Fluency	10.1	18.0	28.5	38.1	4.1	1.3	0.0
Oral Expression	37.5	16.1	15.8	26.5	0.2	4.0	0.0
Oral Production	9.4	16.5	18.1	39.7	10.5	5.7	0.0
<b>Expressive Communication</b>	<b>35.2</b>	<b>15.0</b>	<b>16.3</b>	<b>27.0</b>	<b>6.4</b>	<b>0.0</b>	<b>0.0</b>
Pre-Writing Skills	—	—	—	—	—	—	—
Spelling	45.8	12.0	16.5	22.7	0.0	2.9	0.0
Written Composition	31.3	11.0	18.7	30.2	8.7	0.0	0.0
<b>Written Expression</b>	<b>45.7</b>	<b>6.9</b>	<b>9.5</b>	<b>32.1</b>	<b>4.7</b>	<b>1.1</b>	<b>0.0</b>
<b>Mathematical Calculation</b>	<b>30.8</b>	<b>27.3</b>	<b>19.1</b>	<b>13.0</b>	<b>7.5</b>	<b>2.3</b>	<b>0.0</b>
<b>Mathematical Reasoning</b>	<b>30.8</b>	<b>23.2</b>	<b>18.9</b>	<b>21.3</b>	<b>3.5</b>	<b>2.3</b>	<b>0.0</b>
<b>Academic Achievement Battery</b>	<b>48.3</b>	<b>19.5</b>	<b>15.6</b>	<b>11.9</b>	<b>4.7</b>	<b>0.0</b>	<b>0.0</b>
<b>M</b>	<b>32.4</b>	<b>17.8</b>	<b>16.2</b>	<b>25.3</b>	<b>6.3</b>	<b>1.5</b>	<b>0.6</b>

Note. The Reading Foundational Skills and Pre-Writing Skills subtests were not administered to the learning disability group due to age.

from the normal curve (see Table 5.29). As mentioned earlier, approximately 2.7% of the normal distribution would typically obtain a score less than or equal to a standard score of 69. On average, 76.9% of the intellectual developmental disorder sample obtained scores at or below a standard score of 69 across all AAB subtests and composites.

### **Attention-Deficit/Hyperactivity Disorder**

The AAB was administered to 62 individuals with a diagnosis of ADHD. Table 5.30 presents the mean AAB subtest and composite scores for this group. The range of score discrepancies between the ADHD sample and the normative sample was much smaller than those found in the specific learning disorder and intellectual developmental disorder analyses. The normal distribution provides a clearer picture (see Table 5.31). On average, 6.6% of the ADHD sample scored within the significantly below average range, compared to 2.7% predicted from the normal distribution. A similar comparison was

demonstrated in the percentage of the ADHD group that obtained scores in the moderately below average range. On average, 9.6% of the ADHD sample scored in this range, compared to 7.6% predicted from the normal distribution. For this group, it is also important to examine the specific subtests for which there are larger discrepancies between the two percentages. These findings are consistent with findings from other achievement measures administered to children and adults with ADHD.

### **Speech/Language Impairment**

The AAB was administered to 33 students and adults with a diagnosis of speech/language impairment (SLI). Table 5.32 presents the mean AAB subtest and composite scores for this group. The score discrepancies between the SLI sample and the normative sample ranged from 1 to 19 standard score points. The largest discrepancies were found on the Written Composition, Reading Foundational Skills, Reading Fluency, and Oral Expression subtests. More than 24% of the SLI sample

**Table 5.28**  
**Mean AAB Standard Scores for the Intellectual Developmental Disorder Sample**  
**and the Age-Based Normative Sample**

Subtest/composite	Intellectual developmental disorder		Normative		Mean difference	Effect size
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Reading Foundational Skills	50.00	0.00	100.55	17.14	-50.55	3.02
Letter/Word Reading	58.32	12.60	98.72	16.55	-40.40	2.47
Reading Fluency	55.69	11.67	99.13	15.43	-43.44	2.85
<b>Basic Reading</b>	<b>55.45</b>	<b>11.06</b>	<b>100.00</b>	<b>15.00</b>	<b>-44.55</b>	<b>3.00</b>
Reading Comprehension: Words and Sentences	60.67	17.75	100.17	14.82	-39.51	2.64
Reading Comprehension: Passages	75.77	3.85	98.69	14.08	-22.92	1.67
<b>Reading Comprehension</b>	<b>65.05</b>	<b>10.44</b>	<b>100.07</b>	<b>14.50</b>	<b>-35.03</b>	<b>2.44</b>
Listening Comprehension: Words and Sentences	64.22	18.71	99.67	15.32	-35.45	2.29
Listening Comprehension: Passages	59.85	13.51	100.39	15.22	-40.55	2.68
<b>Listening Comprehension</b>	<b>58.23</b>	<b>13.05</b>	<b>100.10</b>	<b>14.82</b>	<b>-41.87</b>	<b>2.84</b>
Oral Fluency	75.13	11.85	100.63	15.44	-25.51	1.67
Oral Expression	54.69	8.16	99.69	14.77	-45.00	3.10
Oral Production	67.66	13.52	100.29	15.16	-32.63	2.16
<b>Expressive Communication</b>	<b>55.96</b>	<b>9.35</b>	<b>100.00</b>	<b>15.00</b>	<b>-44.04</b>	<b>2.98</b>
Pre-Writing Skills	58.29	16.72	100.89	15.65	-42.60	2.72
Spelling	59.32	12.91	98.77	16.88	-39.45	2.36
Written Composition	61.29	13.93	98.87	16.03	-37.58	2.36
<b>Written Expression</b>	<b>56.12</b>	<b>11.24</b>	<b>100.00</b>	<b>15.01</b>	<b>-43.88</b>	<b>2.96</b>
<b>Mathematical Calculation</b>	<b>53.58</b>	<b>7.66</b>	<b>100.49</b>	<b>15.19</b>	<b>-46.90</b>	<b>3.14</b>
<b>Mathematical Reasoning</b>	<b>59.17</b>	<b>9.71</b>	<b>101.52</b>	<b>14.19</b>	<b>-42.34</b>	<b>3.02</b>
<b>Academic Achievement Battery</b>	<b>52.05</b>	<b>5.56</b>	<b>100.00</b>	<b>14.98</b>	<b>-47.96</b>	<b>3.27</b>

scored within the significantly below average or moderately below average ranges across all AAB subtests and composites compared to 10.3% expected within these two performance ranges (see Table 5.33).

### Summary

Establishing the validity of an assessment is an ongoing, dynamic process that begins with the initial design

and selection of content and continues throughout the development process and beyond. The data presented in this chapter provide strong evidence of several different aspects of test validity, including content, construct, and criterion validity. Evidence for the clinical utility, sensitivity, and overall validity of the AAB has also been presented. As with all tests, these data are only the beginning of the ongoing process of validation.

**Table 5.29**  
**Predicted and Actual Percentages of the Intellectual Developmental Disorder Sample Scoring**  
**Within Seven Clinically Relevant Standard Score Ranges on AAB Subtests and Composites**

	Range of performance						
	Significantly below average	Moderately below average	Below average	Average	Above average	Moderately above average	Significantly above average
Standard score range	≤69	70-79	80-89	90-109	110-119	120-129	≥130
% predicted from normal distribution	2.7	7.6	17.1	49.4	15.1	6.2	1.9
<b>Subtest/composite</b>							
Reading Foundational Skills	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Letter/Word Reading	85.1	1.9	11.2	1.8	0.0	0.0	0.0
Reading Fluency	87.1	4.1	6.9	2.0	0.0	0.0	0.0
<b>Basic Reading</b>	<b>87.0</b>	<b>4.1</b>	<b>6.9</b>	<b>2.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Reading Comprehension: Words and Sentences	79.4	6.7	5.3	6.7	0.0	0.0	1.8
Reading Comprehension: Passages	0.0	92.8	5.0	2.1	0.0	0.0	0.0
<b>Reading Comprehension</b>	<b>79.6</b>	<b>11.9</b>	<b>2.7</b>	<b>5.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Listening Comprehension: Words and Sentences	66.9	6.3	10.0	16.8	0.0	0.0	0.0
Listening Comprehension: Passages	80.1	5.4	8.7	5.7	0.0	0.0	0.0
<b>Listening Comprehension</b>	<b>81.8</b>	<b>6.9</b>	<b>5.9</b>	<b>5.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Oral Fluency	37.9	31.1	16.8	14.2	0.0	0.0	0.0
Oral Expression	89.8	8.3	1.8	0.0	0.0	0.0	0.0
Oral Production	60.4	18.5	14.3	6.8	0.0	0.0	0.0
<b>Expressive Communication</b>	<b>87.4</b>	<b>7.9</b>	<b>4.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Pre-Writing Skills	78.6	0.0	21.4	0.0	0.0	0.0	0.0
Spelling	78.0	9.8	11.3	0.9	0.0	0.0	0.0
Written Composition	76.0	8.1	11.7	4.1	0.0	0.0	0.0
<b>Written Expression</b>	<b>90.2</b>	<b>2.6</b>	<b>3.4</b>	<b>3.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Mathematical Calculation	95.9	1.7	2.4	0.0	0.0	0.0	0.0
Mathematical Reasoning	77.9	21.7	0.4	0.0	0.0	0.0	0.0
Academic Achievement Battery	95.3	4.7	0.0	0.0	0.0	0.0	0.0
<i>M</i>	76.9	12.1	7.2	3.7	0.0	0.0	0.1

**Table 5.30**  
**Mean AAB Standard Scores for the Attention-Deficit/Hyperactivity Disorder (ADHD)**  
**Sample and the Age-Based Normative Sample**

<b>Subtest/composite</b>	<b>ADHD</b>		<b>Normative</b>		<b>Mean difference</b>	<b>Effect size</b>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Reading Foundational Skills	95.66	23.72	100.55	17.14	-4.88	0.28
Letter/Word Reading	97.61	16.19	98.72	16.55	-1.11	0.07
Reading Fluency	93.42	16.93	99.13	15.43	-5.71	0.37
<b>Basic Reading</b>	<b>95.72</b>	<b>16.42</b>	<b>100.00</b>	<b>15.00</b>	<b>-4.28</b>	<b>0.28</b>
Reading Comprehension: Words and Sentences	98.29	15.35	100.17	14.82	-1.88	0.13
Reading Comprehension: Passages	96.59	14.20	98.69	14.08	-2.09	0.15
<b>Reading Comprehension</b>	<b>98.37</b>	<b>14.01</b>	<b>100.07</b>	<b>14.50</b>	<b>-1.71</b>	<b>0.12</b>
Listening Comprehension: Words and Sentences	95.09	14.86	99.67	15.32	-4.58	0.30
Listening Comprehension: Passages	94.99	14.97	100.39	15.22	-5.41	0.36
<b>Listening Comprehension</b>	<b>93.72</b>	<b>14.65</b>	<b>100.10</b>	<b>14.82</b>	<b>-6.38</b>	<b>0.43</b>
Oral Fluency	99.67	18.40	100.63	15.44	-0.96	0.06
Oral Expression	94.33	18.55	99.69	14.77	-5.36	0.36
Oral Production	104.04	19.75	100.29	15.16	3.75	0.24
<b>Expressive Communication</b>	<b>98.94</b>	<b>22.04</b>	<b>100.00</b>	<b>15.00</b>	<b>-1.06</b>	<b>0.07</b>
Pre-Writing Skills	108.19	7.43	100.89	15.65	7.30	0.48
Spelling	96.47	15.88	98.77	16.88	-2.30	0.14
Written Composition	100.83	16.49	98.87	16.03	1.96	0.12
<b>Written Expression</b>	<b>99.03</b>	<b>16.53</b>	<b>100.00</b>	<b>15.01</b>	<b>-0.97</b>	<b>0.06</b>
<b>Mathematical Calculation</b>	<b>94.20</b>	<b>17.22</b>	<b>100.49</b>	<b>15.19</b>	<b>-6.29</b>	<b>0.41</b>
<b>Mathematical Reasoning</b>	<b>94.57</b>	<b>16.91</b>	<b>101.52</b>	<b>14.19</b>	<b>-6.95</b>	<b>0.49</b>
<b>Academic Achievement Battery Composite</b>	<b>94.29</b>	<b>19.30</b>	<b>100.00</b>	<b>14.98</b>	<b>-5.72</b>	<b>0.38</b>

**Table 5.31**  
**Predicted and Actual Percentages of the Attention Deficit/Hyperactivity Disorder (ADHD)**  
**Sample Scoring Within Seven Clinically Relevant Standard Score Ranges on AAB Subtests and Composites**

	Range of performance						
	Significantly below average	Moderately below average	Below average	Average	Above average	Moderately above average	Significantly above average
Standard score range	≤69	70-79	80-89	90-109	110-119	120-129	≥130
% predicted from normal distribution	2.7	7.6	17.1	49.4	15.1	6.2	1.9
<b>Subtest/composite</b>							
Reading Foundational Skills	10.4	31.0	0.0	38.1	5.6	15.0	0.0
Letter/Word Reading	6.2	9.5	11.4	48.2	14.8	9.8	0.0
Reading Fluency	6.7	10.3	16.4	54.3	7.2	1.5	3.5
<b>Basic Reading</b>	<b>7.6</b>	<b>11.2</b>	<b>16.9</b>	<b>35.2</b>	<b>25.7</b>	<b>2.5</b>	<b>0.8</b>
Reading Comprehension: Words and Sentences	12.9	11.7	51.7	21.2	2.6	0.0	0.0
Reading Comprehension: Passages	0.0	14.8	21.7	47.1	11.0	5.4	0.0
<b>Reading Comprehension</b>	<b>1.4</b>	<b>7.9</b>	<b>15.9</b>	<b>58.8</b>	<b>13.2</b>	<b>2.7</b>	<b>0.0</b>
Listening Comprehension: Words and Sentences	3.6	11.5	22.3	45.2	13.9	3.5	0.0
Listening Comprehension: Passages	7.5	9.0	13.0	57.0	12.3	1.3	0.0
<b>Listening Comprehension</b>	<b>6.0</b>	<b>11.1</b>	<b>16.3</b>	<b>52.7</b>	<b>13.0</b>	<b>0.0</b>	<b>0.8</b>
Oral Fluency	3.2	7.2	19.2	41.7	20.3	2.1	6.3
Oral Expression	12.2	7.1	15.6	42.8	16.2	6.1	0.0
Oral Production	5.6	5.8	13.5	35.4	20.9	9.6	9.3
<b>Expressive Communication</b>	<b>12.1</b>	<b>7.9</b>	<b>9.7</b>	<b>30.1</b>	<b>23.2</b>	<b>13.3</b>	<b>3.7</b>
Pre-Writing Skills	0.0	0.0	0.0	31.0	69.0	0.0	0.0
Spelling	3.5	4.3	27.0	44.6	9.5	11.0	0.0
Written Composition	2.7	8.3	9.5	50.3	17.0	12.1	0.0
<b>Written Expression</b>	<b>2.3</b>	<b>8.9</b>	<b>15.2</b>	<b>51.1</b>	<b>9.9</b>	<b>10.0</b>	<b>2.6</b>
Mathematical Calculation	7.1	13.9	21.1	32.6	20.9	3.4	1.0
Mathematical Reasoning	12.4	7.9	7.2	58.1	12.2	2.2	0.0
Academic Achievement Battery	15.4	2.5	20.5	40.7	16.8	3.3	0.8
<i>M</i>	6.6	9.6	16.4	43.6	16.9	5.5	1.4

**Table 5.32**  
**Mean AAB Standard Scores for the Speech/Language Impairment Sample and the Age-Based Normative Sample**

<b>Subtest/composite</b>	<b>Speech/language impairment</b>		<b>Normative</b>		<b>Mean difference</b>	<b>Effect size</b>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Reading Foundational Skills	85.05	18.05	100.55	17.14	-15.50	0.90
Letter/Word Reading	95.08	18.96	98.72	16.55	-3.65	0.22
Reading Fluency	84.63	15.96	99.13	15.43	-14.50	0.94
<b>Basic Reading</b>	<b>91.08</b>	<b>14.30</b>	<b>100.00</b>	<b>15.00</b>	<b>-8.92</b>	<b>0.60</b>
Reading Comprehension: Words and Sentences	89.06	12.54	100.17	14.82	-11.11	0.75
Reading Comprehension: Passages	86.44	11.85	98.69	14.08	-12.24	0.87
<b>Reading Comprehension</b>	<b>87.51</b>	<b>12.29</b>	<b>100.07</b>	<b>14.50</b>	<b>-12.57</b>	<b>0.87</b>
Listening Comprehension: Words and Sentences	95.63	13.10	99.67	15.32	-4.04	0.26
Listening Comprehension: Passages	89.89	12.22	100.39	15.22	-10.50	0.69
<b>Listening Comprehension</b>	<b>90.65</b>	<b>13.56</b>	<b>100.10</b>	<b>14.82</b>	<b>-9.45</b>	<b>0.64</b>
Oral Fluency	96.77	16.55	100.63	15.44	-3.86	0.25
Oral Expression	86.34	17.39	99.69	14.77	-13.34	0.90
Oral Production	97.28	10.80	100.29	15.16	-3.01	0.20
<b>Expressive Communication</b>	<b>90.49</b>	<b>15.83</b>	<b>100.00</b>	<b>15.00</b>	<b>-9.51</b>	<b>0.63</b>
Pre-Writing Skills	99.65	13.75	100.89	15.65	-1.24	0.08
Spelling	89.56	19.23	98.77	16.88	-9.21	0.54
Written Composition	79.62	18.59	98.87	16.03	-19.25	1.20
<b>Written Expression</b>	<b>92.37</b>	<b>15.64</b>	<b>100.00</b>	<b>15.01</b>	<b>-7.63</b>	<b>0.51</b>
Mathematical Calculation	95.41	19.75	100.49	15.19	-5.08	0.33
Mathematical Reasoning	93.14	15.84	101.52	14.19	-8.37	0.59
<b>Academic Achievement Battery Composite</b>	<b>87.67</b>	<b>15.92</b>	<b>100.00</b>	<b>14.98</b>	<b>-12.34</b>	<b>0.82</b>



**Table 5.33**  
**Predicted and Actual Percentages of the Speech/Language Impairment Sample Scoring**  
**Within Seven Clinically Relevant Standard Score Ranges on AAB Subtests and Composites**

	Range of performance						
	Significantly below average	Moderately below average	Below average	Average	Above average	Moderately above average	Significantly above average
Standard score range	≤69	70-79	80-89	90-109	110-119	120-129	≥130
% predicted from normal distribution	2.7	7.6	17.1	49.4	15.1	6.2	1.9
<b>Subtest/composite</b>							
Reading Foundational Skills	17.3	19.7	16.6	43.9	2.5	0.0	0.0
Letter/Word Reading	3.6	20.7	27.8	18.6	19.1	6.1	4.1
Reading Fluency	16.4	12.3	48.1	14.2	4.8	4.1	0.0
<b>Basic Reading</b>	<b>6.2</b>	<b>12.3</b>	<b>29.9</b>	<b>38.0</b>	<b>9.4</b>	<b>4.1</b>	<b>0.0</b>
Reading Comprehension: Words and Sentences	7.5	12.8	28.2	44.1	7.4	0.0	0.0
Reading Comprehension: Passages	0.0	33.6	31.5	35.0	0.0	0.0	0.0
<b>Reading Comprehension</b>	<b>2.7</b>	<b>29.4</b>	<b>23.0</b>	<b>38.7</b>	<b>6.1</b>	<b>0.0</b>	<b>0.0</b>
Listening Comprehension: Words and Sentences	2.8	11.6	19.2	58.5	7.9	0.0	0.0
Listening Comprehension: Passages	9.1	8.0	26.4	55.2	1.2	0.0	0.0
<b>Listening Comprehension</b>	<b>9.0</b>	<b>10.3</b>	<b>21.0</b>	<b>54.3</b>	<b>5.3</b>	<b>0.0</b>	<b>0.0</b>
Oral Fluency	0.0	10.6	30.6	28.3	22.6	1.9	6.1
Oral Expression	19.2	15.3	18.1	33.9	13.5	0.0	0.0
Oral Production	0.0	4.3	19.2	59.5	17.0	0.0	0.0
<b>Expressive Communication</b>	<b>12.0</b>	<b>12.1</b>	<b>21.6</b>	<b>48.2</b>	<b>0.0</b>	<b>6.1</b>	<b>0.0</b>
Pre-Writing Skills	0.0	20.8	6.2	43.5	29.5	0.0	0.0
Spelling	18.5	17.7	19.1	27.7	13.0	4.1	0.0
Written Composition	33.8	8.7	19.8	37.7	0.0	0.0	0.0
<b>Written Expression</b>	<b>7.3</b>	<b>16.1</b>	<b>6.8</b>	<b>58.3</b>	<b>7.3</b>	<b>4.1</b>	<b>0.0</b>
Mathematical Calculation	13.3	9.9	11.1	43.2	16.4	6.1	0.0
Mathematical Reasoning	8.8	10.8	24.3	42.0	5.8	8.3	0.0
Academic Achievement Battery	12.9	23.8	15.7	43.4	4.1	0.0	0.0
<i>M</i>	9.5	15.3	22.1	41.3	9.2	2.1	0.5