

wisc-IV

WECHSLER INTELLIGENCE SCALE
FOR CHILDREN® – FOURTH EDITION

WISC-IV and Children's Memory Scale

Lisa W. Drozdick James Holdnack Eric Rolfhus Larry Weiss

Assessment of declarative memory functions is an important component of neuropsychological, psychological, and psychoeducational evaluations. Deficits in memory functioning have been associated with a number of acquired and developmental disorders of childhood. Memory dysfunction has been reported in a number of neurological conditions including severe closed head injury (Hoffmann, Donders, & Thompson, 2000), surgical removal of brain tumor (Carpentieri, Waber, Pomeroy, Scott, et al., 2003), Temporal Lobe Epilepsy (Culhane-Shelburne, Chapieski, Hiscock, & Glaze, 2002), and prenatal exposure to alcohol (Mattson & Roebuck, 2002). Memory difficulties have also been reported for a number of developmental disorders, such as Reading Disorder (Cohen, 1997; Kramer, Knee, & Delis, 2000); language impairment (Cohen, 1997; Cohen, Riccio, & Hynd, 1999; Shear, Tallal, & Delis, 1992); and Attention Deficit Disorder (Loge, Staton, & Beatty, 1990).

The dissociation between memory and intellectual functioning provides important clinical and diagnostic information for the practitioner. In adults, relationship deficits in memory functioning with relatively intact intellectual functioning may signal the presence of a degenerative disorder or provide direct evidence of an amnesic disorder. In children, deficits in declarative memory functions and serial learning may signal specific cognitive difficulties that may or may not be a manifestation of more global impairments in cognition. To make the distinction of global versus specific cognitive impairment, it is necessary to demonstrate dissociation between intellectual functioning and memory functioning. Some children may exhibit modality-specific impairments in memory functioning, such as in the ability to learn new information when presented auditorily. Deficits in this domain may reflect more global impairments in language functioning, such as those that occur in language disorder or a specific impairment that may be observed as a sequelae of an acquired medical or neurological condition. Comparison of verbal intellectual ability versus auditory memory provides a method for determining the co-occurrence of the two problem areas.

In light of recent recommendations to change IDEA legislation, school psychologists will find the assessment of memory function an important mechanism for documenting deficits in psychological processes in children with learning disabilities. As part of a comprehensive psychoeducational evaluation involving intellectual and academic assessment, the clinician may document weaknesses in verbal, visual, immediate or delayed memory, and learning by using the *Children's Memory Scale* (CMS; Cohen, 1997). Specific weaknesses in auditory learning and working memory often underlie commonly occurring developmental disorders.

During the standardization of the *Wechsler Intelligence Scale for Children-Fourth Edition* (Wechsler, 2003), linking data was collected on the *Children's Memory Scale* (CMS; Cohen, 1997). This technical report presents the basic information on the composition of the CMS, psychometric properties of the two scales and their relations, and information on how to conduct ability-memory discrepancy analyses. Psychometric information on the General Ability Index (GAI) from the WISC-IV is also included. For more information on the GAI, refer to the *General Ability Index* (WISC-IV Technical Report No. 4; Raiford, Rolfhus, Weiss, & Coalson, 2005).

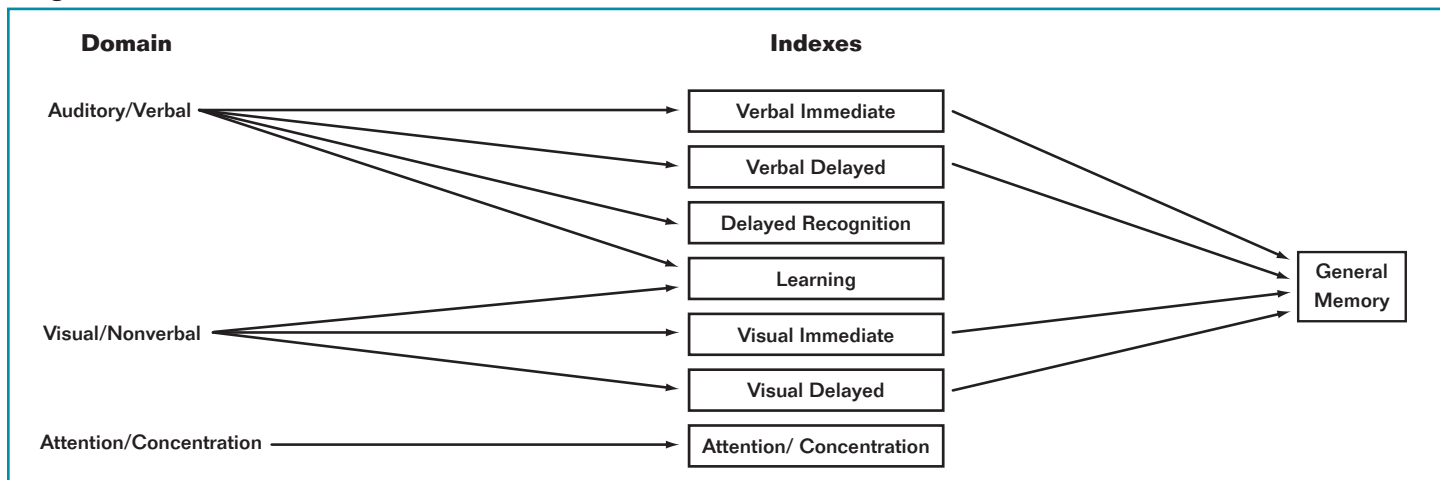
The CMS is an individually administered, comprehensive assessment instrument designed to evaluate learning and memory functioning in children ages 5 through 16 years. It assesses memory and learning functioning across three domains: auditory/verbal learning and memory, visual/nonverbal learning and memory, and attention/concentration. Each domain contains two core subtests and one supplemental subtest. Moreover, each subtest in the auditory/verbal and visual/nonverbal domains contains both an immediate memory and a delayed memory portion. Table 1 lists the CMS subtests by domain.

From these subtests, eight index scores are derived: Verbal Immediate, Verbal Delayed, Delayed Recognition, Learning, Visual Immediate, Visual Delayed, Attention/Concentration, and General Memory. Figure 1 portrays the subtests contributing to each index score.

Table 1 CMS Core and Supplemental Subtests, by Domain

Domain	Core Subtests	Supplemental Subtests
Auditory/Verbal	Stories (Immediate and Delayed) Word Pairs (Immediate and Delayed)	Word Lists (Immediate and Delayed)
Visual/Nonverbal	Dot Locations (Immediate and Delayed) Faces (Immediate and Delayed)	Family Pictures (Immediate and Delayed)
Attention/Concentration	Numbers Sequences	Picture Locations

Figure 1 CMS Indexes



The index scores represent functioning within and across the domains. Six of the index scores derive from subtests from the same domain but assessing different aspects of memory or attention within that domain. The indexes associated with specific domains represent various aspects of learning and memory functioning, such as immediate (i.e., short-term) memory, delayed memory, learning, and attention within the domain. The Learning index is derived from subtest scores from the auditory and visual domains. The overall index, the General Memory Index, represents global memory functioning and includes the immediate and delayed memory indexes from both the auditory/verbal and visual/nonverbal domains.

The CMS was nationally standardized on 1,000 children aged 5 through 16 years. Standard scores are provided for the eight indexes. Standard scores on CMS are derived on the same scale as WISC-IV composite scores, with a mean of 100 and a standard deviation of 15. Reliability coefficients were computed for the eight index scores according to a reliability formula for a composite of several tests (Nunnally, 1978, p. 246). They are presented along with the WISC-IV composite score reliabilities in Table 2.

Table 2 WISC-IV Composite and CMS Index Reliabilities

Composite/Index	Overall Average r_{xx} ^a
WISC-IV	
FSIQ	0.97
GAI	0.96
VCI	0.94
PRI	0.92
WMI	0.92
PSI	0.88^b
CMS	
Visual Immediate	0.76
Visual Delayed	0.76
Verbal Immediate	0.86
Verbal Delayed	0.84
General Memory	0.91
Attention/Concentration	0.87
Learning	0.85
Delayed Recognition	0.80

^a Average reliability coefficients were calculated with Fisher's *z* transformation.

^b Calculated using test-retest stability coefficients.

Linking the WISC-IV and CMS

The WISC-IV and the CMS were administered to 126 children aged 6–16 with a testing interval of 0–66 days and a mean testing interval of 12 days. All children were administered the WISC-IV first and the CMS second. The sample comprised 64 girls (50.8%) and 62 boys (49.2%) with an average age of 11.3 years (± 3.0). The sample demographics were as follows: 3.2% African American; 28.6% Hispanic; 5.6% Asian; 59.5% White; and 3.2% Other ethnicity. Of the sample's parent education level, 6.4% completed 8 or fewer years of education; 13.5% completed 9–11 years; 23.0% completed 12 years; 31.0% completed 13–15 years; and 26.2% completed 16 or more years. For geographic distribution, 59.5% of the sample was from the West; 38.1% from the South; and 2.4% from the Northeast.

Table 3 presents the corrected correlations at the composite level. The WISC-IV composites and CMS Indexes correlated in the low to high range from 0.21 (for VCI–Visual Delayed) to 0.74 (for WMI–Attention/Concentration). The FSIQ demonstrated its highest correlation with Attention/Concentration (.72), and moderate correlations (.48–.63) were also observed with all CMS Indexes except for Visual Immediate (.34) and Visual Delayed (.31) Indexes. The GAI demonstrated moderate correlations with all of the CMS Indexes (.42–.62) with the exception of Visual Immediate (.28) and Visual Delayed (.28). The VCI exhibited a similar pattern of correlations with the

CMS indexes, though the values were slightly lower and the highest value was found for Verbal Delayed. The PRI correlations with CMS Indexes were in the low-moderate range (.29–.36), with the exception of Verbal Delayed (.46), General Memory (.46), and Attention/Concentration (.55). The WMI correlations with CMS Indexes were in the moderate to high range (.32–.74), with the exception of Visual Delayed (.27). The CMS Attention/Memory Index shares the greatest amount of variance with the WISC-IV subtests and composites. This great amount of variance is due, in part, to overlapping methodologies within the indexes. The CMS Numbers subtest (Attention/Concentration Index) is an alternate form of WISC-IV Digit Span (Working Memory Index). These results support that memory functioning is a distinct cognitive process that is related to the intellect but not the same as intellectual functioning.

The CMS composite scores predicted from the WISC-IV FSIQ, GAI, VCI, and PRI are provided in Tables 4–7. The FSIQ is the recommended ability measure for predicting memory scores on the CMS except in those cases where the GAI, VCI, or PRI is a more appropriate representation of the examinee's true ability (e.g., when there is a significant discrepancy between VCI and PRI or the child has visual or motor problems that may interfere with the validity of some subtests).

Table 3 WISC-IV Composites and CMS Index Correlations

CMS Index	WISC-IV Composite				
	FSIQ	GAI	VCI	PRI	WMI
Visual Immediate	.34	.28	.23	.29	.35
Visual Delayed	.31	.28	.21	.30	.27
Verbal Immediate	.56	.49	.55	.36	.48
Verbal Delayed	.63	.57	.60	.46	.46
General Memory	.61	.54	.54	.46	.52
Attention/Concentration	.72	.62	.58	.55	.74
Learning	.51	.42	.42	.33	.49
Delayed Recognition	.48	.45	.51	.31	.32

Note. Correlations were corrected for the variability of the WISC-IV standardization sample (Guilford & Fruchter, 1978).

Ability-Memory Discrepancy Analysis

Completing the Discrepancy Analysis

1. Determine the appropriate ability standard score to be used (i.e., FSIQ, GAI, VCI, or PRI).
2. Determine whether or not you want to use the predicted-actual or simple-difference method of calculating ability-memory discrepancies. If you are not required to use a particular method, the predicted-actual method is recommended (Reynolds, 1985). Although both methods are used, the predicted-actual method is generally preferred because the formula takes into account the reliabilities and the correlations between the two measures. In this method, the ability score is used to predict a memory score, and the predicted- and observed-memory scores are compared. In the simple-difference method, the observed ability and memory scores are compared.

Predicted-Actual Method: The accuracy of discrepancy analysis is enhanced when the correlation between memory and ability scores is accounted for in the comparison between the scores. Shepard (1980) was one of the first advocates of using the predicted-actual method with ability achievement, and many other experts also have recommended its use (Braden & Weiss, 1988; Kavale & Forness, 1995; Konold, 1999). Technically, with this method, the ability score is used in a regression equation to predict the expected memory score for an individual. Due to low correlations between PRI and several CMS Index scores, predicted scores from the PRI are not provided for the Verbal Immediate, Learning, and Delayed Recognition Indexes. Predicted scores for Visual Immediate and Visual Delayed are not provided in any of the predicted score tables due to low correlations between the Visual Immediate and Visual Delayed Indexes and the WISC-IV Indexes.

Simple-Difference Method: With the simple-difference method, a CMS standard score is subtracted directly from the ability composite score. The method is easy to use and widely employed but often criticized by psychometric researchers. As Braden and Weiss (1988) showed in IQ-achievement discrepancies with the simple-difference method, the correlation between the two scores is ignored and can result in errors of classification.

3. Calculate the desired ability-memory discrepancies. For example, for the predicted-actual method, using a WISC-IV FSIQ, locate the predicted CMS indexes in Table 4. Subtract each actual index from the corresponding predicted index to obtain the ability memory difference. Tables 4-7 provide the CMS composite scores predicted from the WISC-IV FSIQ, GAI, VCI, and PRI, respectively.

To use the simple-difference method of calculating ability-memory discrepancies, subtract each CMS index from the ability score to obtain the ability-memory difference.

4. To determine how frequently a difference score occurred in the WISC-IV-CMS sample, see Tables 8 and 9. Table 8 presents frequencies for differences according to the predicted-actual method. Table 9 presents frequencies for differences according to the simple-difference method. The base rate of the difference between two scores refers to the frequency of such a difference in the population. The statistically significant differences between scores are not presented here. The rationale for providing only discrepancy base rates lies in the observation that obtained difference scores may be statistically significant yet not atypical of the general population; however, difference scores that occur infrequently in the linking sample are always statistically significant.

Table 4 CMS Composite Scores Predicted from WISC-IV FSIQ Scores

WISC-IV FSIQ	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
40	66	62	63	57	69	71
41	67	63	64	58	70	72
42	68	63	65	58	70	72
43	68	64	65	59	71	73
44	69	65	66	60	71	73
45	69	65	66	60	72	74
46	70	66	67	61	72	74
47	70	67	68	62	73	75
48	71	67	68	63	73	75
49	71	68	69	63	74	76
50	72	69	70	64	75	76
51	73	69	70	65	75	76
52	73	70	71	65	76	77
53	74	70	71	66	76	77
54	74	71	72	67	77	78
55	75	72	73	68	77	78
56	75	72	73	68	78	79
57	76	73	74	69	78	79
58	76	74	74	70	79	80
59	77	74	75	70	79	80
60	78	75	76	71	80	81
61	78	75	76	72	80	81
62	79	76	77	73	81	82
63	79	77	77	73	81	82
64	80	77	78	74	82	83
65	80	78	79	75	82	83
66	81	79	79	76	83	84
67	82	79	80	76	83	84
68	82	80	80	77	84	85
69	83	80	81	78	84	85
70	83	81	82	78	85	86
71	84	82	82	79	85	86
72	84	82	83	80	86	87
73	85	83	84	81	86	87
74	85	84	84	81	87	88
75	86	84	85	82	87	88
76	87	85	85	83	88	88
77	87	86	86	83	88	89
78	88	86	87	84	89	89
79	88	87	87	85	89	90
80	89	87	88	86	90	90
81	89	88	88	86	90	91
82	90	89	89	87	91	91
83	90	89	90	88	91	92
84	91	90	90	88	92	92
85	92	91	91	89	92	93
86	92	91	91	90	93	93
87	93	92	92	91	93	94
88	93	92	93	91	94	94
89	94	93	93	92	94	95
90	94	94	94	93	95	95
91	95	94	95	94	95	96
92	96	95	95	94	96	96
93	96	96	96	95	96	97
94	97	96	96	96	97	97
95	97	97	97	96	97	98
96	98	97	98	97	98	98
97	98	98	98	98	98	99
98	99	99	99	99	99	99
99	99	99	99	99	99	100

Table 4 CMS Composite Scores Predicted from WISC-IV FSIQ Scores (continued)

WISC-IV FSIQ	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
100	100	100	100	100	100	100
101	101	101	101	101	101	100
102	101	101	101	101	101	101
103	102	102	102	102	102	101
104	102	103	102	103	102	102
105	103	103	103	104	103	102
106	103	104	104	104	103	103
107	104	104	104	105	104	103
108	104	105	105	106	104	104
109	105	106	105	106	105	104
110	106	106	106	107	105	105
111	106	107	107	108	106	105
112	107	108	107	109	106	106
113	107	108	108	109	107	106
114	108	109	109	110	107	107
115	108	109	109	111	108	107
116	109	110	110	112	108	108
117	110	111	110	112	109	108
118	110	111	111	113	109	109
119	111	112	112	114	110	109
120	111	113	112	114	110	110
121	112	113	113	115	111	110
122	112	114	113	116	111	111
123	113	114	114	117	112	111
124	113	115	115	117	112	112
125	114	116	115	118	113	112
126	115	116	116	119	113	112
127	115	117	116	119	114	113
128	116	118	117	120	114	113
129	116	118	118	121	115	114
130	117	119	118	122	115	114
131	117	120	119	122	116	115
132	118	120	120	123	116	115
133	118	121	120	124	117	116
134	119	121	121	124	117	116
135	120	122	121	125	118	117
136	120	123	122	126	118	117
137	121	123	123	127	119	118
138	121	124	123	127	119	118
139	122	125	124	128	120	119
140	122	125	124	129	120	119
141	123	126	125	130	121	120
142	124	126	126	130	121	120
143	124	127	126	131	122	121
144	125	128	127	132	122	121
145	125	128	127	132	123	122
146	126	129	128	133	123	122
147	126	130	129	134	124	123
148	127	130	129	135	124	123
149	127	131	130	135	125	124
150	128	132	131	136	126	124
151	129	132	131	137	126	124
152	129	133	132	137	127	125
153	130	133	132	138	127	125
154	130	134	133	139	128	126
155	131	135	134	140	128	126
156	131	135	134	140	129	127
157	132	136	135	141	129	127
158	132	137	135	142	130	128
159	133	137	136	142	130	128
160	134	138	137	143	131	129

Table 5 CMS Composite Scores Predicted from WISC-IV GAI Scores

WISC-IV GAI	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
40	71	66	68	63	75	73
41	71	66	68	63	75	73
42	72	67	69	64	76	74
43	72	68	69	65	76	74
44	73	68	70	65	76	75
45	73	69	70	66	77	75
46	74	69	71	67	77	76
47	74	70	71	67	78	76
48	75	70	72	68	78	77
49	75	71	72	68	79	77
50	76	72	73	69	79	78
51	76	72	74	70	79	78
52	76	73	74	70	80	78
53	77	73	75	71	80	79
54	77	74	75	71	81	79
55	78	74	76	72	81	80
56	78	75	76	73	82	80
57	79	75	77	73	82	81
58	79	76	77	74	82	81
59	80	77	78	75	83	82
60	80	77	78	75	83	82
61	81	78	79	76	84	82
62	81	78	79	76	84	83
63	82	79	80	77	84	83
64	82	79	81	78	85	84
65	83	80	81	78	85	84
66	83	81	82	79	86	85
67	84	81	82	80	86	85
68	84	82	83	80	87	86
69	85	82	83	81	87	86
70	85	83	84	81	87	87
71	86	83	84	82	88	87
72	86	84	85	83	88	87
73	87	85	85	83	89	88
74	87	85	86	84	89	88
75	88	86	87	85	90	89
76	88	86	87	85	90	89
77	89	87	88	86	90	90
78	89	87	88	86	91	90
79	90	88	89	87	91	91
80	90	89	89	88	92	91
81	91	89	90	88	92	91
82	91	90	90	89	92	92
83	92	90	91	89	93	92
84	92	91	91	90	93	93
85	93	91	92	91	94	93
86	93	92	92	91	94	94
87	94	93	93	92	95	94
88	94	93	94	93	95	95
89	95	94	94	93	95	95
90	95	94	95	94	96	96
91	96	95	95	94	96	96
92	96	95	96	95	97	96
93	97	96	96	96	97	97
94	97	97	97	96	97	97
95	98	97	97	97	98	98
96	98	98	98	98	98	98
97	99	98	98	98	99	99
98	99	99	99	99	99	99
99	100	99	99	99	100	100

Table 5 CMS Composite Scores Predicted from WISC-IV GAI Score (continued)

WISC-IV GAI	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
100	100	100	100	100	100	100
101	100	101	101	101	100	100
102	101	101	101	101	101	101
103	101	102	102	102	101	101
104	102	102	102	102	102	102
105	102	103	103	103	102	102
106	103	103	103	104	103	103
107	103	104	104	104	103	103
108	104	105	104	105	103	104
109	104	105	105	106	104	104
110	105	106	105	106	104	105
111	105	106	106	107	105	105
112	106	107	106	107	105	105
113	106	107	107	108	105	106
114	107	108	108	109	106	106
115	107	109	108	109	106	107
116	108	109	109	110	107	107
117	108	110	109	111	107	108
118	109	110	110	111	108	108
119	109	111	110	112	108	109
120	110	111	111	112	108	109
121	110	112	111	113	109	109
122	111	113	112	114	109	110
123	111	113	112	114	110	110
124	112	114	113	115	110	111
125	112	114	114	116	111	111
126	113	115	114	116	111	112
127	113	115	115	117	111	112
128	114	116	115	117	112	113
129	114	117	116	118	112	113
130	115	117	116	119	113	114
131	115	118	117	119	113	114
132	116	118	117	120	113	114
133	116	119	118	120	114	115
134	117	119	118	121	114	115
135	117	120	119	122	115	116
136	118	121	119	122	115	116
137	118	121	120	123	116	117
138	119	122	121	124	116	117
139	119	122	121	124	116	118
140	120	123	122	125	117	118
141	120	123	122	125	117	118
142	121	124	123	126	118	119
143	121	125	123	127	118	119
144	122	125	124	127	118	120
145	122	126	124	128	119	120
146	123	126	125	129	119	121
147	123	127	125	129	120	121
148	124	127	126	130	120	122
149	124	128	126	130	121	122
150	125	129	127	131	121	123
151	125	129	128	132	121	123
152	125	130	128	132	122	123
153	126	130	129	133	122	124
154	126	131	129	133	123	124
155	127	131	130	134	123	125
156	127	132	130	135	124	125
157	128	132	131	135	124	126
158	128	133	131	136	124	126
159	129	134	132	137	125	127
160	129	134	132	137	125	127

Table 6 CMS Composite Scores Predicted from WISC-IV VCI Scores

WISC-IV VCI	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
45	70	67	70	68	77	72
46	70	68	71	69	77	72
47	71	68	71	69	78	73
48	71	69	72	70	78	73
49	72	69	72	70	79	74
50	73	70	73	71	79	75
51	73	71	74	72	79	75
52	74	71	74	72	80	76
53	74	72	75	73	80	76
54	75	72	75	73	81	77
55	75	73	76	74	81	77
56	76	74	76	74	82	78
57	76	74	77	75	82	78
58	77	75	77	76	82	79
59	77	75	78	76	83	79
60	78	76	78	77	83	80
61	79	77	79	77	84	80
62	79	77	79	78	84	81
63	80	78	80	79	84	81
64	80	78	81	79	85	82
65	81	79	81	80	85	82
66	81	80	82	80	86	83
67	82	80	82	81	86	83
68	82	81	83	81	87	84
69	83	81	83	82	87	84
70	84	82	84	83	87	85
71	84	83	84	83	88	85
72	85	83	85	84	88	86
73	85	84	85	84	89	86
74	86	84	86	85	89	87
75	86	85	87	86	90	87
76	87	86	87	86	90	88
77	87	86	88	87	90	88
78	88	87	88	87	91	89
79	88	87	89	88	91	89
80	89	88	89	88	92	90
81	90	89	90	89	92	90
82	90	89	90	90	92	91
83	91	90	91	90	93	91
84	91	90	91	91	93	92
85	92	91	92	91	94	92
86	92	92	92	92	94	93
87	93	92	93	92	95	93
88	93	93	94	93	95	94
89	94	93	94	94	95	94
90	95	94	95	94	96	95
91	95	95	95	95	96	95
92	96	95	96	95	97	96
93	96	96	96	96	97	96
94	97	96	97	97	97	97
95	97	97	97	97	98	97
96	98	98	98	98	98	98
97	98	98	98	98	99	98
98	99	99	99	99	99	99
99	99	99	99	99	100	99
100	100	100	100	100	100	100
101	101	101	101	101	100	101
102	101	101	101	101	101	101
103	102	102	102	102	101	102
104	102	102	102	102	102	102

Table 6 CMS Composite Scores Predicted from WISC-IV VCI Score (continued)

WISC-IV VCI	Verbal Immediate	Verbal Delayed	General Memory	Attention/ Concentration	Learning	Delayed Recognition
105	103	103	103	103	102	103
106	103	104	103	103	103	103
107	104	104	104	104	103	104
108	104	105	104	105	103	104
109	105	105	105	105	104	105
110	106	106	105	106	104	105
111	106	107	106	106	105	106
112	107	107	106	107	105	106
113	107	108	107	108	105	107
114	108	108	108	108	106	107
115	108	109	108	109	106	108
116	109	110	109	109	107	108
117	109	110	109	110	107	109
118	110	111	110	110	108	109
119	110	111	110	111	108	110
120	111	112	111	112	108	110
121	112	113	111	112	109	111
122	112	113	112	113	109	111
123	113	114	112	113	110	112
124	113	114	113	114	110	112
125	114	115	114	115	111	113
126	114	116	114	115	111	113
127	115	116	115	116	111	114
128	115	117	115	116	112	114
129	116	117	116	117	112	115
130	117	118	116	117	113	115
131	117	119	117	118	113	116
132	118	119	117	119	113	116
133	118	120	118	119	114	117
134	119	120	118	120	114	117
135	119	121	119	120	115	118
136	120	122	119	121	115	118
137	120	122	120	121	116	119
138	121	123	121	122	116	119
139	121	123	121	123	116	120
140	122	124	122	123	117	120
141	123	125	122	124	117	121
142	123	125	123	124	118	121
143	124	126	123	125	118	122
144	124	126	124	126	118	122
145	125	127	124	126	119	123
146	125	128	125	127	119	123
147	126	128	125	127	120	124
148	126	129	126	128	120	124
149	127	129	126	128	121	125
150	128	130	127	129	121	126
151	128	131	128	130	121	126
152	129	131	128	130	122	127
153	129	132	129	131	122	127
154	130	132	129	131	123	128
155	130	133	130	132	123	128

Table 7 CMS Composite Scores Predicted from WISC-IV PRI Scores

WISC-IV PRI	Verbal Immediate^a	Verbal Delayed	General Memory	Attention/ Concentration	Learning^a	Delayed Recognition^a
45		75	75	70		
46		75	75	70		
47		76	76	71		
48		76	76	71		
49		77	77	72		
50		77	77	73		
51		77	77	73		
52		78	78	74		
53		78	78	74		
54		79	79	75		
55		79	79	75		
56		80	80	76		
57		80	80	76		
58		81	81	77		
59		81	81	77		
60		82	82	78		
61		82	82	79		
62		83	83	79		
63		83	83	80		
64		83	83	80		
65		84	84	81		
66		84	84	81		
67		85	85	82		
68		85	85	82		
69		86	86	83		
70		86	86	84		
71		87	87	84		
72		87	87	85		
73		88	88	85		
74		88	88	86		
75		89	89	86		
76		89	89	87		
77		89	89	87		
78		90	90	88		
79		90	90	88		
80		91	91	89		
81		91	91	90		
82		92	92	90		
83		92	92	91		
84		93	93	91		
85		93	93	92		
86		94	94	92		
87		94	94	93		
88		94	94	93		
89		95	95	94		
90		95	95	95		
91		96	96	95		
92		96	96	96		
93		97	97	96		
94		97	97	97		
95		98	98	97		
96		98	98	98		
97		99	99	98		
98		99	99	99		
99		100	100	99		
100		100	100	100		
101		100	100	101		
102		101	101	101		
103		101	101	102		
104		102	102	102		

Table 7 CMS Composite Scores Predicted from WISC-IV PRI Scores (continued)

WISC-IV PRI	Verbal Immediate^a	Verbal Delayed	General Memory	Attention/ Concentration	Learning^a	Delayed Recognition^a
105		102	102	103		
106		103	103	103		
107		103	103	104		
108		104	104	104		
109		104	104	105		
110		105	105	106		
111		105	105	106		
112		106	106	107		
113		106	106	107		
114		106	106	108		
115		107	107	108		
116		107	107	109		
117		108	108	109		
118		108	108	110		
119		109	109	110		
120		109	109	111		
121		110	110	112		
122		110	110	112		
123		111	111	113		
124		111	111	113		
125		112	112	114		
126		112	112	114		
127		112	112	115		
128		113	113	115		
129		113	113	116		
130		114	114	117		
131		114	114	117		
132		115	115	118		
133		115	115	118		
134		116	116	119		
135		116	116	119		
136		117	117	120		
137		117	117	120		
138		117	117	121		
139		118	118	121		
140		118	118	122		
141		119	119	123		
142		119	119	123		
143		120	120	124		
144		120	120	124		
145		121	121	125		
146		121	121	125		
147		122	122	126		
148		122	122	126		
149		123	123	127		
150		123	123	128		
151		123	123	128		
152		124	124	129		
153		124	124	129		
154		125	125	130		
155		125	125	130		

^aPredicted scores were not reported due to correlations with PRI below 0.40.

Table 8 Differences Between Predicted and Obtained CMS Subtest and Composite Scores for Various Percentages of the Theoretical Normal Distribution (Base Rates): Predicted-Difference Method Using Various WISC-IV Composite Scores

WISC-IV Composite	CMS Composite	Percentage of Theoretical Normal Distribution (Base Rate)								
		25	20	15	10	5	4	3	2	1
FSIQ	Verbal Immediate	9	11	13	16	21	22	24	26	29
	Verbal Delayed	8	10	13	15	20	21	22	24	28
	General Memory	9	11	13	16	20	21	23	25	28
	Attention/Concentration	8	9	11	14	18	19	20	22	25
	Learning	9	11	14	17	22	23	25	27	31
	Delayed Recognition	9	12	14	17	22	24	25	28	31
GAI	Verbal Immediate	9	12	14	17	22	23	25	27	31
	Verbal Delayed	9	11	13	16	21	22	24	26	29
	General Memory	9	11	14	17	21	23	24	26	30
	Attention/Concentration	8	10	13	16	20	21	23	25	28
	Learning	10	12	15	18	23	24	26	28	32
	Delayed Recognition	10	12	14	18	23	24	26	28	32
VCI	Verbal Immediate	9	11	13	17	21	22	24	26	30
	Verbal Delayed	9	11	13	16	20	22	23	25	28
	General Memory	9	11	14	17	21	23	24	26	30
	Attention/Concentration	9	11	13	16	21	22	23	26	29
	Learning	10	12	15	18	23	24	26	28	32
	Delayed Recognition	9	11	14	17	22	23	25	27	31
PRI	Verbal Immediate	10	12	15	18	24	25	27	29	33
	Verbal Delayed	9	12	14	18	22	24	26	28	31
	General Memory	9	12	14	18	22	24	26	28	31
	Attention/Concentration	9	11	13	17	21	22	24	26	30
	Learning	10	12	15	19	24	25	27	30	33
	Delayed Recognition	10	13	15	19	24	25	27	30	34

Note. Percentages in Table 8 represent the theoretical proportion of CMS scores lower than various WISC-IV composite scores by the specified amount or more.

Table 9 Differences Between WISC-IV FSIQ, VCI, PRI, and WMI Scores and CMS Subtest and Composite Scores for Various Percentages of the Theoretical Normal Distribution (Base Rates): Simple-Difference Method

WISC-IV Composite	CMS Composite	Percentage of Theoretical Normal Distribution (Base Rate)								
		25	20	15	10	5	4	3	2	1
FSIQ	Verbal Immediate	10	12	15	19	24	25	27	29	33
	Verbal Delayed	9	11	14	17	22	23	25	27	31
	General Memory	9	12	14	17	22	24	25	28	31
	Attention/Concentration	8	10	12	15	19	20	22	24	27
	Learning	11	13	16	20	25	26	28	31	35
	Delayed Recognition	11	13	16	20	26	27	29	32	36
GAI	Verbal Immediate	11	13	16	20	25	27	29	32	36
	Verbal Delayed	10	12	15	18	23	25	27	29	33
	General Memory	10	13	15	19	24	26	28	30	34
	Attention/Concentration	9	12	14	17	22	23	25	27	31
	Learning	11	14	17	21	27	29	31	34	38
	Delayed Recognition	11	14	17	21	26	28	30	33	37
VCI	Verbal Immediate	10	12	15	19	24	25	27	30	34
	Verbal Delayed	10	12	14	18	23	24	26	28	32
	General Memory	10	13	15	19	24	26	28	30	34
	Attention/Concentration	10	12	15	18	23	25	26	29	32
	Learning	11	14	17	21	27	29	31	34	38
	Delayed Recognition	11	13	16	20	25	26	28	31	35
PRI	Verbal Immediate	12	15	18	22	28	30	32	35	40
	Verbal Delayed	11	14	17	20	26	28	30	33	37
	General Memory	11	14	17	20	26	28	30	33	37
	Attention/Concentration	10	12	15	19	24	25	27	30	34
	Learning	12	15	18	23	29	31	33	36	41
	Delayed Recognition	12	15	19	23	29	31	34	37	41
WMI	Verbal Immediate	11	13	16	20	26	27	29	32	36
	Verbal Delayed	11	14	17	20	26	28	30	33	37
	General Memory	10	13	16	19	25	26	28	31	35
	Attention/Concentration	8	10	12	14	18	19	21	23	26
	Learning	11	13	16	20	25	27	29	32	36
	Delayed Recognition	12	15	19	23	29	31	33	36	41

Note. Percentages in Table 9 represent the theoretical proportion of CMS scores lower than WISC-IV FSIQ, VCI, PRI, and WMI scores by the specified amount or more.

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