

# wisc-IV

WECHSLER INTELLIGENCE SCALE  
FOR CHILDREN® – FOURTH EDITION

## General Ability Index

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### Overview

This technical report provides information about the derivation and uses of the General Ability Index (GAI). The GAI is a composite score that is based on three Verbal Comprehension and three Perceptual Reasoning subtests, and does not include the Working Memory or Processing Speed subtests included in the Full Scale IQ (FSIQ). Detailed information about the GAI, beyond what is covered in this technical report, is available in a chapter by Saklofske, Prifitera, Weiss, Rolfhus, and Zhu in *WISC-IV Clinical Use and Interpretation: Scientist-Practitioner Perspectives* (Prifitera, Saklofske & Weiss, 2005).

This report is based on an analysis of the UK standardisation data for WISC-IV<sup>UK</sup> and WIAT-II<sup>UK</sup> to produce UK equivalent tables to those found in WISC-IV Technical Report 4 by Raiford, Weiss, Rolfhus and Coalson (2005). Note that the UK version tables are for all ages, rather than for 6:0-11:11 and 12:0 to 16:0 separately, as is set out in the US report.

### Background and History of the Wechsler Composites and the GAI

The original Wechsler Intelligence Scale for Children (WISC; Wechsler, 1949), the Wechsler Intelligence Scale for Children – revised (WISC-R; Wechsler, 1974), and the WISC-III included an FSIQ as well as a Verbal IQ (VIQ) and Performance IQ (PIQ). The WISC-III introduced four index scores to represent more narrow domains of cognitive function: the Verbal Comprehension Index (VCI), the Perceptual Organisation Index (POI), the Freedom from Distractibility Index (FDI), and the Processing Speed Index (PSI). With the introduction of these index scores, a total of seven composite scores could be derived with the WISC-III: the FSIQ, VIQ, PIQ, VCI, POI, FDI, and PSI.

The introduction of the index scores gave practitioners the ability to select the composite scores that best described verbal and perceptual ability, based on the outcome of the assessment. When necessary to aid in interpretation, the practitioner could describe verbal abilities using the VCI in place of the VIQ, and describe perceptual abilities using the POI in place of the PIQ. This flexibility was particularly useful when scores for certain subtests contributing to the VIQ or PIQ were discrepant at a significant and unusual level. In particular, the index scores were preferable for cases in which the VIQ was considered less descriptive of verbal ability than the VCI because Arithmetic – a subtest from the working memory domain – was discrepant from the verbal comprehension subtests at a level that was unusual in the standardisation sample and for cases in which the PIQ was considered less descriptive of perceptual ability than the POI because Coding – a subtest drawn from the processing speed domain – was discrepant from the perceptual organisation subtests at a level that was unusual in the standardisation sample.

The GAI was first developed for use with the WISC-III by Prifitera, Weiss, and Saklofske (1998) to offer additional flexibility in describing broad intellectual ability. The WISC-III GAI provided a measure of general cognitive ability that did not include the influence of Arithmetic or Coding on FSIQ. The WISC-III GAI was based on the sum of scaled scores for all subtests that contributed to the traditional ten-subtest FSIQ, with the exception of Arithmetic and Coding. The eight contributing subtests were all drawn from the verbal comprehension and perceptual organisation domains, and included Picture Completion, Information, Similarities, Picture Arrangement, Block Design, Vocabulary, Object Assembly, and Comprehension. The WISC-III GAI was recommended as a useful composite to estimate overall ability if a great deal of variability existed within VIQ and/or PIQ due to low scores on Arithmetic and/or Coding (Prifitera et al., 1998). The GAI was subsequently applied for use with the WISC-III using Canadian norms (Weiss, Saklofske, Prifitera, Chen & Hildebrand, 1999), the WAIS-III (Tulsky, Saklofske, Wilkins & Weiss, 2001), and the WAIS-III using Canadian norms (Saklofske, Gorsuch, Weiss, Zhu & Patterson, 2005).

The WISC-IV<sup>UK</sup> provides an FSIQ and a four-index framework similar to that of the WISC-III. The framework is based on theory and supported by clinical research and factor-analytic results. As noted in the WISC-IV Technical and Interpretive Manual (Wechsler, 2003), the POI was renamed the Perceptual Reasoning Index (PRI) to reflect more accurately the increased emphasis on fluid reasoning abilities in this index, and the FDI was renamed the Working Memory Index (WMI), which more accurately describes the abilities measured. In addition, the dual IQ and Index score

structure was no longer utilised. The elimination of the dual structure reduced concerns about the influence of working memory and processing speed when summarising verbal comprehension and perceptual reasoning abilities, respectively. The WISC-IV<sup>UK</sup> FSIQ, however, includes (to a greater extent than the WISC-III FSIQ) the influence of working memory and processing speed, to reflect research that suggests both working memory and processing speed are important factors that contribute to overall intellectual functioning (Engle, Laughlin, Tuholski & Conway, 1999; Fry & Hale, 1996, 2000; Heinz-Martin, Oberauer, Wittmann, Wilhelm & Schulze, 2002; Miller & Vernon, 1996; Vigil-Colet & Codorniu-Raga, 2002). Recent research continues to confirm the importance of working memory and processing speed to cognitive ability and to refine knowledge about the nature of these relations (Colom, Rebollo, Palacios, Juan-Espinosa & Kyllonen, 2004; Mackintosh & Bennett, 2003; Schweizer & Moosbrugger, 2004).

The FSIQ is used most frequently to describe an underlying, global aspect of general intelligence, or *g*. The FSIQ is utilised for a number of purposes in clinical practice. The FSIQ can serve as a summary of performance across a number of specific cognitive ability domains (i.e. verbal comprehension, perceptual reasoning, working memory, and processing speed). It is used most often in conjunction with other information as part of a diagnostic evaluation in clinics and hospital settings, to determine eligibility to receive special education services in public school settings, or to make decisions about level of care and placement in residential settings.

The FSIQ is an aggregate score that summarises performance across multiple cognitive abilities in a single number. When unusual variability is observed within the set of subtests that comprise the FSIQ, clinical interpretation should characterise this diversity of abilities in order to be most useful for parents, teachers, and other professionals.

## Introduction to the WISC-IV GAI

As with the WISC-III GAI and WAIS-III GAI, the WISC-IV<sup>UK</sup> GAI provides the practitioner a summary score that is less sensitive to the influence of working memory and processing speed. For children with neuropsychological issues such as learning disorders, Attention-Deficit/Hyperactivity Disorder, and other similar issues, difficulties with working memory and processing speed may result in lower FSIQ scores (Wechsler, 2003). In children with intact neuropsychological functioning, the GAI may provide a comparable approximation of overall intellectual ability as represented by the FSIQ (Prifitera et al., 2005; Weiss et al., 1999).

The GAI can be used as a substitute for the FSIQ to determine eligibility for special education services and placement classification. The GAI increases flexibility in this respect, because it is sensitive to cases in which working memory performance is discrepant from verbal comprehension performance and/or processing speed performance is discrepant from perceptual reasoning performance at an unusual level. It can also be compared to the FSIQ to assess the effects of working memory and processing speed on the expression of cognitive ability.

Various sources for GAI tables are available; however, those sources differ according to the method by which they were created. Four such sources are (a) this technical report (UK data), (b) Prifitera et al. (2005) (US data); (c) Flanagan and Kaufman (2004) (US data); and (d) Dumont and Willis (2004) (US data). The GAI tables provided in this technical report (UK

data) and in Prifitera et al. (2005) (US data) are the only GAI tables supported by Harcourt Assessment, Inc. (formerly known as The Psychological Corporation). These tables were created using the actual WISC-IV standardisation sample from the UK and US as appropriate, whereas the GAI tables provided in other sources were created using statistical approximation. The calculations in Flanagan and Kaufman (2004), and Dumont and Willis (2004) (using US data) were based on a statistical technique for linear equating that was developed by Tellegen and Briggs (1967, Formula 4), which allowed the GAI to be calculated based on intercorrelations among the VCI and the PRI. In contrast, tables in this technical report provide values for the GAI based on the standardisation sample, and the sum of subtest scaled scores that contribute to the index. The Tellegen and Briggs formula underestimates scores in the upper portion of the distribution and overestimates scores in the lower portion of the distribution. On average, this difference is approximately 2–3 points, but can be as much as 6 points for some children with mental retardation or some gifted children. The Tellegen and Briggs formula is appropriate for use if the actual standardisation data are not available: The tables provided by Flanagan and Kaufman (2004) and by Dumont and Willis (2004) were generated while practitioners were waiting for the tables based on the standardisation sample to be created. As the tables based on the standardisation sample are now available, those GAI tables should be considered out of date. Thus, practitioners in the UK are advised to use the GAI tables in this technical report.

## The role of Ability in Determining Eligibility for Special Education Services as Learning Disabled

The *WISC-IV Integrated Technical and Interpretive Manual* (Wechsler et al., 2004) outlines a number of concerns with the isolated use of the ability–achievement discrepancy model for identifying learning disabilities. An ability–achievement discrepancy (AAD) indicates that some problem exists, as achievement is not at a level commensurate with cognitive ability. Established practice currently includes the use of ability–achievement discrepancies as general screeners for nonspecific learning problems. The general finding of such a discrepancy should be followed with additional assessment before a formal diagnosis is rendered. A determination that a

learning disability is present requires evidence of impairment in the core cognitive processes underlying the specific academic skill of concern, but an AAD alone is often sufficient evidence to obtain special education services in most public school settings. Although several new models for evaluating learning disorders and learning disabilities have been proposed recently (Berninger, Dunn & Alper, 2005; Berninger & O'Donnell, 2005), diagnostic markers generally have yet to be established clearly in the literature. Some progress has been made in this area, however. For example, pseudoword decoding and rapid automatized naming appear to predict early reading disorders.

## When to Use the GAI

Presently, many local education authorities continue to require evidence of an AAD in order to obtain special education services, and it was largely for this reason that the GAI was first developed. For some children with learning disabilities, attentional problems, or other neuropsychological issues, concomitant working memory and processing speed deficiencies lower the FSIQ. This is evident in Table 4 (see pages 9–10), which shows that FSIQ < GAI profiles were obtained by more than 70% of children in the following WISC–IV special group samples: Reading Disorder (N = 56), Reading and Written Expression Disorders (N = 35), Reading, Written Expression, and Mathematics Disorders (N = 42), and Learning Disorder and Attention-Deficit/Hyperactivity Disorder (N = 45). While potentially clinically meaningful, this reduction in the FSIQ may decrease the magnitude of the AAD for some children with learning disabilities and make them less likely to be found eligible for special education services in educational systems that do not allow consideration of other methods of eligibility determination.

It also may be clinically informative in a number of additional situations to compare the FSIQ and the GAI, to assess the impact of reducing the emphasis on working memory and processing speed on the estimate of general cognitive ability for children with difficulty in those areas due to traumatic brain injury or other neuropsychological difficulties. This comparison may inform rehabilitation programs and/or educational intervention planning.

It is important for practitioners to recognise that the GAI is not necessarily a more valid estimate of overall cognitive ability than the FSIQ. Working memory and processing speed are vital to the comprehensive evaluation of cognitive ability, and excluding these abilities from the evaluation can be misleading. The classroom performance of two children with the same GAI score but very different WMI/PSI scores will likely be quite different. In educational situations where evidence of a significant AAD is required to obtain services, the GAI may be used as the ability score; however, the WMI and PSI should still be reported and interpreted. Refer to chapters 2 and 3 of *WISC–IV Clinical Use and Interpretation: Scientist-Practitioner Perspectives* (Prifitera et al., 2005) for additional discussion.

The practitioner may wish to consider using the GAI in a number of clinical situations, not limited to, but including the following:

- a significant and unusual discrepancy exists between VCI and WMI;
- a significant and unusual discrepancy exists between PRI and PSI;
- a significant and unusual discrepancy exists between WMI and PSI; or
- significant and unusual intersubtest scatter exists within WMI and/or PSI.

To review index discrepancies, consult the discrepancy comparison critical value and base rate tables B.1–B.6 of the *WISC–IV<sup>UK</sup> Administration and Scoring Manual* (Wechsler, 2003) using the procedures outlined in chapter 2 of the manual. The Analysis Page of the WISC–IV<sup>UK</sup> Record Form provides space for these pairwise discrepancy comparisons in the Discrepancy Comparisons table. A statistically significant difference between index scores, however, may not indicate that there is a clinically significant difference: The frequency of occurrence in the standardisation sample (base rate), not just the critical value, should be considered. Consult Table B.2 in the *WISC–IV<sup>UK</sup> Administration and Scoring Manual* (Wechsler, 2004) to obtain the base rate for a given discrepancy. Sattler (2001) suggests that differences between scores that occur in less than 10% to 15% of the standardisation sample should be judged as unusual. Subtest scatter can be examined within the FSIQ, and within the VCI and PRI, using Table B.6 of the *WISC–IV<sup>UK</sup> Administration and Scoring Manual* (Wechsler, 2004).

The following steps are provided as a guide for calculating the GAI and comparing it to the FSIQ to obtain more information about a child's cognitive ability.

### Calculate the General Ability Sum of Scaled Scores

If you have determined that the GAI is important to consider in interpretation, calculate the General Ability Sum of Scaled Scores. The General Ability Sum of Scaled Scores is the sum of scaled scores for three Verbal Comprehension subtests (i.e. Vocabulary, Comprehension, and Similarities) and three Perceptual Reasoning subtests (i.e. Block Design, Matrix Reasoning, and Picture Concepts). Record the General Ability Sum of Scaled Scores.

In some situations, you may choose to substitute a supplemental subtest for a core subtest that contributes to the GAI. Follow the same subtest substitution rules that are outlined in the *WISC–IV<sup>UK</sup> Administration and Scoring Manual* (Wechsler, 2004) for the FSIQ if you choose to substitute a supplemental subtest for a core subtest that contributes to the GAI. Follow the standard administration order of subtests listed in chapter 2 of the *WISC–IV<sup>UK</sup> Administration and Scoring Manual* (Wechsler, 2004) even when you expect to substitute a supplemental subtest for a core subtest.

### Determine the GAI Composite Score

Locate the General Ability Sum of Scaled Scores in the extreme left column of Table 1. Read across the row to determine the GAI composite score. Continue to read across the row to find the corresponding percentile rank and confidence intervals. Record the composite score, the percentile rank, and the confidence interval (90% or 95%).

**Table 1: WISC-IV<sup>UK</sup> GAI Equivalents of Sums of Scaled Scores**

Sum of Scaled Scores	GAI	Percentile Rank	Confidence Level		Sum of Scaled Scores	GAI	Percentile Rank	Confidence Level	
			90%	95%				90%	95%
6	40	<0.1	38-47	37-48	61	101	53	96-106	95-107
7	40	<0.1	38-47	37-48	62	102	55	97-107	96-108
8	40	<0.1	38-47	37-48	63	103	58	98-108	97-109
9	40	<0.1	38-47	37-48	64	104	61	99-109	98-109
10	40	<0.1	38-47	37-48	65	105	63	100-110	99-110
11	40	<0.1	38-47	37-48	66	106	66	101-110	100-111
12	41	<0.1	39-48	38-49	67	107	68	102-111	101-112
13	42	<0.1	40-49	39-50	68	108	70	103-112	102-113
14	43	<0.1	41-50	40-51	69	110	75	105-114	104-115
15	44	<0.1	42-51	41-52	70	111	77	106-115	105-116
16	45	<0.1	42-52	42-53	71	112	79	107-116	106-117
17	46	<0.1	43-53	43-54	72	113	81	108-117	107-118
18	47	<0.1	44-54	43-55	73	115	84	110-119	109-120
19	49	<0.1	46-56	45-57	74	116	86	111-120	110-121
20	51	0.1	48-58	47-59	75	117	87	112-121	111-122
21	52	0.1	49-59	48-60	76	119	90	114-123	113-124
22	53	0.1	50-60	49-61	77	120	91	114-124	114-125
23	55	0.1	52-62	51-62	78	121	92	115-125	115-126
24	57	0.2	54-63	53-64	79	122	93	116-126	115-127
25	58	0.3	55-64	54-65	80	123	94	117-127	116-128
26	59	0.3	56-65	55-66	81	124	95	118-128	117-129
27	61	0.5	58-67	57-68	82	126	96	120-130	119-131
28	63	1	60-69	59-70	83	127	96	121-131	120-132
29	64	1	61-70	60-71	84	128	97	122-132	121-133
30	65	1	62-71	61-72	85	129	97	123-133	122-133
31	67	1	64-73	63-74	86	130	98	124-134	123-134
32	69	2	66-75	65-76	87	132	98	126-135	125-136
33	70	2	66-76	66-77	88	133	99	127-136	126-137
34	71	3	67-77	67-78	89	135	99	129-138	128-139
35	73	4	69-79	68-80	90	136	99	130-139	129-140
36	74	4	70-80	69-81	91	138	99	132-141	131-142
37	75	5	71-81	70-82	92	139	99.5	133-142	132-143
38	77	6	73-83	72-84	93	140	99.6	134-143	133-144
39	78	7	74-84	73-85	94	142	99.7	136-145	135-146
40	79	8	75-85	74-85	95	143	99.8	137-146	136-147
41	81	10	77-86	76-87	96	144	99.8	138-147	137-148
42	82	12	78-87	77-87	97	146	99.9	139-149	139-150
43	83	13	79-88	78-89	98	147	99.9	140-150	139-151
44	84	14	80-89	79-90	99	148	99.9	141-151	140-152
45	85	16	81-90	80-91	100	150	>99.9	143-153	142-154
46	86	18	82-91	81-92	101	151	>99.9	144-154	143-155
47	87	19	83-92	82-93	102	153	>99.9	146-156	145-157
48	88	21	84-93	83-94	103	154	>99.9	147-157	146-157
49	89	23	85-94	84-95	104	153	>99.9	148-158	147-158
50	90	25	86-95	85-96	105	156	>99.9	149-158	148-159
51	91	27	87-96	86-97	106	157	>99.9	150-159	149-160
52	92	30	88-97	87-98	107	158	>99.9	151-160	150-161
53	93	32	89-98	88-99	108	159	>99.9	152-161	151-162
54	94	34	90-99	89-100	109	160	>99.9	153-162	152-163
55	95	37	90-100	90-101	110	160	>99.9	153-162	152-163
56	96	39	91-101	91-102	111	160	>99.9	153-162	152-163
57	97	42	92-102	91-103	112	160	>99.9	153-162	152-163
58	98	45	93-103	92-104	113	160	>99.9	153-162	152-163
59	99	47	94-104	93-105	114	160	>99.9	153-162	152-163
60	100	50	95-105	94-106					

## Analyse the FSIQ-GAI Discrepancy

Calculate the difference between the FSIQ and the GAI by subtracting the GAI composite score from the FSIQ composite score. Record this value. Table 2 provides the required differences between the FSIQ and the GAI to attain statistical significance (critical values) at the .15 and .05 levels for each age group. Select the desired level of statistical significance and note it for your records. Using Table 2, find the age group of the child and the desired level of significance. Read across the row to the appropriate column to determine the critical value and record this critical value. The absolute value of the child's difference score must equal or exceed that critical value to be statistically significant. Determine whether or not the absolute value of the child's difference score equals or exceeds the corresponding critical value.

Table 3 provides the percentage of children in the WISC-IV<sup>UK</sup> standardisation sample that obtained the same or greater discrepancy between the FSIQ and the GAI (base rate). The values reported in Table 3 are provided for the overall standardisation sample and by ability level, and are separated into “-” and “+” columns, based on the direction of the difference. Locate the absolute value of the child's difference score in the Amount of Discrepancy column to the extreme left or right, and read across the row to the column that corresponds to the direction of the difference score (e.g. FSIQ < GAI) either by the overall sample or by ability level, if desired. Record this value.

In some situations, practitioners may wish to determine how unusual the same or greater FSIQ-GAI discrepancy was in a particular special group sample (e.g. children identified as intellectually gifted, children diagnosed with various learning disorders) that is relevant to the child being evaluated. Table 4 provides the percentage of children from various special groups described in the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003) who obtained the same or greater discrepancy between the FSIQ and the GAI (base rate). The values are provided for children identified as intellectually gifted, children with mild or moderate mental retardation, children with various

**Table 2: Differences Between WISC-IV<sup>UK</sup> FSIQ and GAI Scores Required for Statistical Significance (Critical Values) By Age Group and Overall Standardisation Sample**

Level of Significance	Composite Pair FSIQ-GAI
.15	6
.05	8

Note: Differences required for statistical significance are based on the standard errors of measurement of each composite and are calculated from the following formula:

$$\text{Critical Value of Difference Score} = Z \sqrt{(SEM_a)^2 + (SEM_b)^2}$$

Where Z is the normal curve value associated with the desired two-tailed significance level and  $SEM_a$  and  $SEM_b$  are the standard errors of measurement for the two composites.

learning disorders, children with a Learning Disorder and Attention-Deficit/Hyperactivity Disorder, children with Attention-Deficit/Hyperactivity Disorder, children with Expressive Language Disorder, children with Mixed Receptive-Expressive Language Disorder, children with traumatic brain injury, children with Autistic Disorder, children with Asperger's disorder, and children with motor impairment. The values reported in Table 4 are separated by special group and into ‘-’ and ‘+’ columns for each special group, based on the direction of the difference. Locate the absolute value of the child's difference score in the Amount of Discrepancy column to the extreme left or right, and read across the row to the column that corresponds to the desired special group of comparison and to the direction of the difference score (e.g. FSIQ < GAI). Record this value.

**Table 3: Cumulative Percentages of Standardisation Sample (Base Rates) Obtaining Various WISC-IVUK FSIQ-GAI Score Discrepancies, by Overall Sample and Ability Level**

Amount of Discrepancy	Overall sample		GAI <= 79		80<=GAI<=89		90<=GAI<=109		110<=GAI<=119		GAI >= 120		Amount of Discrepancy
	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	20
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	19
18	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	18
17	0.5	0.2	0.0	2.5	0.0	0.0	0.0	0.0	0.8	0.0	3.6	0.0	17
16	0.5	0.2	0.0	2.5	0.0	0.0	0.0	0.0	0.8	0.0	3.6	0.0	16
15	0.6	0.2	0.0	2.5	0.0	0.0	0.0	0.0	0.8	0.0	5.4	0.0	15
14	0.8	0.2	0.0	2.5	0.0	0.0	0.0	0.0	0.8	0.0	7.1	0.0	14
13	0.9	0.5	0.0	2.5	0.0	0.0	0.6	0.0	0.8	0.0	8.9	0.0	13
12	1.7	0.8	0.0	5.0	0.0	0.0	0.9	0.0	1.6	0.0	14.3	0.0	12
11	2.7	1.6	0.0	5.0	0.0	0.0	2.4	0.0	1.6	0.0	21.4	0.0	11
10	4.1	2.2	0.0	5.0	2.7	0.0	3.5	0.0	3.2	0.0	26.8	0.0	10
9	6.0	5.0	0.0	15.0	6.7	0.0	7.1	0.0	5.6	1.6	28.6	0.0	9
8	8.3	6.3	0.0	15.0	13.3	0.0	9.1	0.0	7.2	2.4	33.9	0.0	8
7	11.3	9.1	0.0	22.5	16.0	2.7	12.4	0.0	10.4	4.0	33.9	0.0	7
6	15.3	11.9	0.0	30.0	24.0	4.0	15.9	0.0	15.2	4.8	39.3	1.8	6
5	20.6	16	0.0	37.5	25.3	10.7	20.0	0.0	28.0	8.0	44.6	1.8	5
4	27.4	20.8	7.5	40.0	30.7	20.0	24.4	0.0	35.2	12.8	51.8	3.6	4
3	34.6	26.1	10.0	57.5	34.7	24.0	28.8	0.0	42.4	18.4	62.5	7.1	3
2	44.3	33.5	15.0	65.0	40.0	30.7	37.4	0.0	60.0	24.8	69.6	10.7	2
1	51.6	40.6	22.5	70.0	53.3	38.7	45.3	0.0	63.2	29.6	76.8	17.9	1
Mean	4.5	4.3	2.4	4.6	4.6	2.8	6.2	0.0	4.4	5.6	7.0	6.9	Mean
s.d.	3.2	3.0	1.3	3.9	3.0	1.5	4.2	0.0	2.8	4.0	5.0	3.7	s.d.
Median	4.0	4.0	2.0	5.0	4.0	2.0	6.0	0.0	4.0	5.0	6.0	6.0	Median

**Table 4: Cumulative Percentages of Various Special Group Samples (Base Rates) Obtaining Various WISC-IV FSIQ-GAI Score Discrepancies**

Amount of Discrepancy	Clinical Group																Amount of Discrepancy	
	GT (N = 63)		MR Mild (N = 63)		MR Mod (N = 57)		RD (N = 56)		RWD (N = 35)		MD (N = 33)		RWMD (N = 42)		LD/ADHD (N = 45)			
	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)		
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18
17	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17
16	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16
15	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15
14	3.3	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	14
13	3.3	0.0	0.0	0.0	0.0	0.0	3.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	13
12	5.0	0.0	0.0	0.0	0.0	0.0	3.8	1.9	9.4	0.0	0.0	0.0	0.0	0.0	17.1	0.0	0.0	12
11	8.3	0.0	0.0	0.0	0.0	0.0	5.7	1.9	9.4	0.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0	11
10	13.3	0.0	1.8	0.0	2.1	2.1	7.5	1.9	9.4	0.0	0.0	0.0	0.0	2.6	24.4	0.0	0.0	10
9	15.0	0.0	3.6	0.0	2.1	4.2	9.4	1.9	18.8	0.0	3.3	0.0	0.0	10.5	24.4	2.4	2.4	9
8	20.0	0.0	7.1	3.6	2.1	6.3	22.6	3.8	21.9	0.0	13.3	0.0	0.0	15.8	31.7	2.4	2.4	8
7	25.0	0.0	10.7	7.1	2.1	8.3	37.7	5.7	28.1	0.0	20.0	0.0	0.0	18.4	34.1	4.9	4.9	7
6	31.7	0.0	14.3	17.9	2.1	14.6	47.2	5.7	43.8	0.0	26.7	3.3	2.6	26.3	41.5	7.3	7.3	6
5	40.0	0.0	16.1	25.0	2.1	22.9	50.9	7.5	53.1	3.1	33.3	6.7	2.6	39.5	43.9	9.8	9.8	5
4	43.3	6.7	17.9	33.9	2.1	25.0	56.6	9.4	65.6	6.3	36.7	10.0	2.6	44.7	46.3	9.8	9.8	4
3	53.3	13.3	25.0	50.0	4.2	29.2	64.2	13.2	68.8	6.3	46.7	16.7	10.5	55.3	61.0	14.6	14.6	3
2	65.0	20.0	33.9	51.8	4.2	39.6	66.0	15.1	71.9	9.4	53.3	23.3	15.8	65.8	68.3	17.1	17.1	2
1	68.3	25.0	37.5	57.1	6.3	54.2	75.5	17.0	84.4	12.5	56.7	30.0	26.3	71.1	73.2	22.0	22.0	1
Mean	5.9	2.6	4.5	4.3	5.7	3.8	6.0	5.1	5.7	3.0	5.1	3.0	3.5	4.9	6.8	4.1	4.1	Mean
s.d.	3.9	1.1	2.8	1.9	6.4	2.7	3.2	3.7	3.3	1.8	2.5	1.7	3.3	2.7	4.3	2.8	2.8	s.d.
Median	5.0	3.0	3.0	4.0	3.0	3.0	6.5	4.0	6.0	3.0	5.0	3.0	3.0	5.0	6.0	3.0	3.0	Median

Note. GT = Intellectually Gifted; MR Mild = Mental Retardation-Mild Severity; MR Mod = Mental Retardation-Moderate Severity; RD = Reading Disorder; RWD = Reading and Written Expression Disorders; MD = Mathematics Disorder; RWMD = Reading, Written Expression, and Mathematics Disorders; LD/ADHD = Learning Disorder and Attention-Deficit/Hyperactivity Disorder.

**Table 4: Cumulative Percentages of Various Special Group Samples (Base Rates) Obtaining Various WISC-IV FSIQ-GAI Score Discrepancies (continued)**

Amount of Discrepancy	Clinical Group																		Amount of Discrepancy
	ADHD (N = 89)		ELD (N = 27)		RELD (N = 41)		OHI (N = 16)		CHI (N = 27)		AUT (N = 19)		ASP (N = 27)		MI (N = 21)				
	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)	FSIQ<GAI (-)	FSIQ>GAI (+)			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	
14	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	
13	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	
12	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	
11	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11	
10	6.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	
9	9.8	1.2	4.5	0.0	18.4	0.0	14.3	0.0	4.0	0.0	14.3	0.0	4.0	0.0	41.7	11.1	0.0	9	
8	17.1	1.2	9.1	0.0	23.7	0.0	21.4	0.0	8.0	0.0	23.7	0.0	8.0	0.0	45.8	22.2	0.0	8	
7	19.5	1.2	9.1	0.0	28.9	0.0	28.6	0.0	8.0	0.0	28.9	0.0	8.0	0.0	58.3	27.8	0.0	7	
6	30.5	4.9	18.2	0.0	34.2	0.0	42.9	0.0	32.0	0.0	34.2	0.0	32.0	0.0	58.3	33.3	0.0	6	
5	35.4	4.9	31.8	0.0	44.7	10.5	42.9	0.0	40.0	0.0	44.7	0.0	40.0	0.0	62.5	55.6	0.0	5	
4	39.0	7.3	50.0	9.1	50.0	10.5	50.0	0.0	48.0	4.0	50.0	0.0	48.0	0.0	70.8	55.6	0.0	4	
3	45.1	9.8	54.5	9.1	60.5	15.8	50.0	0.0	52.0	4.0	60.5	0.0	52.0	0.0	79.2	72.2	5.6	3	
2	54.9	17.1	68.2	13.6	65.8	21.1	57.1	0.0	64.0	8.0	65.8	0.0	64.0	0.0	79.2	88.9	5.6	2	
1	65.9	20.7	77.3	13.6	71.1	23.7	71.4	0.0	72.0	12.0	71.1	0.0	72.0	5.9	87.5	88.9	11.1	1	
Mean	5.0	3.5	4.2	3.3	6.0	3.8	5.8		4.6	2.3	9.2	1.0	8.5	7.3	5.3	2.0	Mean		
s.d.	3.2	3.0	2.3	1.2	3.4	2.0	3.9		2.5	1.5	3.8	1.0	5.1	3.2	2.9	1.4	s.d.		
Median	5.0	2.0	4.0	4.0	5.0	3.0	6.0		5.0	2.0	9.0	1.0	8.0	6.0	5.0	2.0	Median		

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; ELD = Expressive Language Disorder; RELD = Mixed Receptive-Expressive Language Disorder; OHI = Open Head Injury; CHI = Closed Head Injury; AUT = Autistic Disorder; ASP = Asperger's Disorder; MI = Motor Impairment..



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## Reporting and Describing the GAI

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### Standard Score

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The GAI is an age-corrected standard score. It can be interpreted similarly to other composite scores, as outlined in

chapter 6 of the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003).

### Percentile Rank

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Age-based percentile ranks are provided for the GAI that indicate a child's standing relative to other children the same age. Percentile ranks reflect points on a scale at or below which a given percentage of scores lie, based on the standardisation

sample. The percentile ranks for the GAI are interpreted as are other percentile ranks, as described in chapter 6 of the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003).

### Standard Error of Measurement and Confidence Interval

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Scores on measures of cognitive ability are based on observational data and represent estimates of a child's true scores. They reflect a child's true abilities combined with some degree of measurement error. Confidence intervals provide another means of expressing score precision and serve as a

reminder that measurement error is inherent in all scores. Refer to chapter 6 of the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003) for additional information about confidence intervals and their use in interpretation.

### Descriptive Classification

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Composite scores, including the GAI, can be described in qualitative terms according to the child's level of performance. Refer to chapter 6 of the *WISC-IV Technical and Interpretive*

*Manual* (Wechsler, 2003) for qualitative descriptions of the WISC-IV composite scores, which also may be used to describe the GAI.

## Suggested Procedure for Basic Interpretation of the GAI

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Note that this procedure is supplemental and does not replace any portion of the 10-step procedure outlined in

chapter 6 of the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003).

### Evaluate the Overall Composite Scores

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The FSIQ and the GAI are composite scores that should always be evaluated in the context of the subtests that contribute to that composite score. Extreme variability within the subtests that comprise the FSIQ or the GAI indicates that the score represents a summary of diverse abilities.

Practitioners should examine closely the relative performance on subtests that contribute to the composite score when interpreting that score. Part of the decision to use the GAI also typically involves reviewing the discrepancies among the four index scores.

### Evaluate the FSIQ-GAI Discrepancy

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The first step in performing a pairwise comparison is aimed at determining whether the absolute value of the score difference is significant. Table 2 provides the minimum differences between the FSIQ and the GAI required for statistical significance (critical values) at the .15 and .05 levels of confidence by age group. When the absolute value of the obtained difference between the FSIQ and the GAI is equal to or larger than the critical value, the difference is considered a true difference rather than a difference due to measurement error or random fluctuation. If the two scores are not significantly different, this implies that reducing the influence of working memory and processing speed on the estimate of overall ability resulted in little difference.

If comparison of the FSIQ and the GAI indicates a significant difference, the practitioner should then judge how rare the difference is in the general population. Table 3 provides the cumulative frequency of discrepancies between the FSIQ and the GAI in the WISC-IV<sup>UK</sup> standardisation sample (base rates). The base rate provides a basis for estimating how rare or common a child's obtained score difference is compared to the general population. Table 4 provides the cumulative frequency of discrepancies between the FSIQ and the GAI in various WISC-IV special group samples. Refer to chapter 6 of the *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003) for additional information.



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## Ability-Achievement Discrepancy

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When ability-achievement discrepancy assessment is present as part of the learning disability determination process, there are two methods for comparing intellectual ability and academic achievement: the predicted-difference method and the simple-difference method. Although both methods are used, the predicted-difference method is generally preferred because the formula accounts for the reliabilities and the correlations between the two measures. Use of the predicted-difference method requires that the ability and achievement measure were

co-normed on the same national sample. The predicted-difference method uses the ability score to predict an achievement score, and then compares the predicted and observed achievement scores. The simple-difference method merely compares the observed ability and achievement scores. The *WIAT-II<sup>UK</sup> Examiner's Manual* (Harcourt Assessment, Inc., 2005) provides additional details related to the rationale for choosing these methods and the statistical procedures involved.

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## Predicted-Difference Method

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Table 5 provides WIAT-II<sup>UK</sup> subtest and composite scores predicted from WISC-IV<sup>UK</sup> GAI scores. Locate the GAI score in the extreme left or right column, and read across the row to obtain the child's predicted WIAT-II<sup>UK</sup> subtest and composite scores.

Record the predicted scores. For each subtest or composite, subtract the child's predicted score from the obtained score to obtain the difference score. Record these difference scores. Ability-Achievement Discrepancy

**Table 5 WIAT-II<sup>UK</sup> Subtest and Composite Scores Predicted from WISC-IV<sup>UK</sup> GAI Scores**

WISC-IV <sup>UK</sup> GAI	WIAT-II														UK
	Subtest Scores									Composite Scores					
	WR	NO	RC	SP	PD	MR	WE	LC	OE	RD	MA	WL	OL	TA	
40	63	65	60	69	71	59	76	60	76	59	60	69	62	54	40
41	64	66	60	70	71	59	77	61	76	60	60	69	63	55	41
42	64	66	61	70	72	60	77	61	76	61	61	70	63	56	42
43	65	67	62	71	72	61	78	62	77	61	62	70	64	57	43
44	65	68	62	71	73	61	78	63	77	62	62	71	65	57	44
45	66	68	63	72	73	62	78	63	78	63	63	72	65	58	45
46	67	69	64	72	74	63	79	64	78	63	64	72	66	59	46
47	67	69	64	73	74	63	79	65	78	64	64	73	67	60	47
48	68	70	65	73	75	64	80	65	79	65	65	73	67	60	48
49	68	70	66	74	75	65	80	66	79	66	66	74	68	61	49
50	69	71	66	74	76	66	80	67	80	66	66	74	68	62	50
51	70	72	67	75	76	66	81	67	80	67	67	75	69	63	51
52	70	72	68	75	76	67	81	68	81	68	68	75	70	64	52
53	71	73	68	76	77	68	81	69	81	68	68	76	70	64	53
54	72	73	69	76	77	68	82	69	81	69	69	76	71	65	54
55	72	74	70	77	78	69	82	70	82	70	70	77	72	66	55
56	73	75	70	78	78	70	83	71	82	70	70	77	72	67	56
57	73	75	71	78	79	70	83	71	83	71	71	78	73	67	57
58	74	76	72	79	79	71	83	72	83	72	72	78	73	68	58
59	75	76	72	79	80	72	84	73	83	72	72	79	74	69	59
60	75	77	73	80	80	72	84	73	84	73	73	79	75	70	60
61	76	77	74	80	81	73	85	74	84	74	74	80	75	70	61
62	77	78	75	81	81	74	85	75	85	74	74	80	76	71	62
63	77	79	75	81	82	75	85	75	85	75	75	81	77	72	63
64	78	79	76	82	82	75	86	76	85	76	76	81	77	73	64
65	78	80	77	82	83	76	86	77	86	76	76	82	78	73	65
66	79	80	77	83	83	77	87	77	86	77	77	82	79	74	66
67	80	81	78	83	84	77	87	78	87	78	78	83	79	75	67
68	80	81	79	84	84	78	87	79	87	78	78	83	80	76	68
69	81	82	79	84	85	79	88	79	87	79	79	84	80	76	69
70	81	83	80	85	85	79	88	80	88	80	80	84	81	77	70
71	82	83	81	85	86	80	89	81	88	80	80	85	82	78	71
72	83	84	81	86	86	81	89	81	89	81	81	85	82	79	72
73	83	84	82	86	87	81	89	82	89	82	82	86	83	79	73
74	84	85	83	87	87	82	90	83	89	82	82	87	84	80	74
75	85	86	83	87	88	83	90	83	90	83	83	87	84	81	75
76	85	86	84	88	88	83	91	84	90	84	84	88	85	82	76
77	86	87	85	88	89	84	91	85	91	84	84	88	85	83	77
78	86	87	85	89	89	85	91	85	91	85	85	89	86	83	78
79	87	88	86	89	90	86	92	86	91	86	86	89	87	84	79
80	88	88	87	90	90	86	92	87	92	86	87	90	87	85	80
81	88	89	87	90	91	87	93	87	92	87	87	90	88	86	81
82	89	90	88	91	91	88	93	88	93	88	88	91	89	86	82
83	89	90	89	91	92	88	93	89	93	89	89	91	89	87	83
84	90	91	89	92	92	89	94	89	94	89	89	92	90	88	84
85	91	91	90	92	93	90	94	90	94	90	90	92	91	89	85
86	91	92	91	93	93	90	94	91	94	91	91	93	91	89	86
87	92	92	91	93	94	91	95	91	95	91	91	93	92	90	87
88	93	93	92	94	94	92	95	92	95	92	92	94	92	91	88
89	93	94	93	94	95	92	96	93	96	93	93	94	93	92	89
90	94	94	93	95	95	93	96	93	96	93	93	95	94	92	90
91	94	95	94	95	96	94	96	94	96	94	94	95	94	93	91
92	95	95	95	96	96	94	97	95	97	95	95	96	95	94	92
93	96	96	95	96	97	95	97	95	97	95	95	96	96	95	93
94	96	97	96	97	97	96	98	96	98	96	96	97	96	95	94
95	97	97	97	97	98	97	98	97	98	97	97	97	97	96	95
96	98	98	97	98	98	97	98	97	98	97	97	98	97	97	96
97	98	98	98	98	99	98	99	98	99	98	98	98	98	98	97
98	99	99	99	99	99	99	99	99	99	99	99	99	99	98	98
99	99	99	99	99	100	99	100	99	100	99	99	99	99	99	99
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Table 5 WIAT-II<sup>UK</sup> Subtest and Composite Scores Predicted from WISC-IV<sup>UK</sup> GAI Scores**

WISC-IV <sup>UK</sup> GAI	WIAT-II														UK
	Subtest Scores									Composite Scores					
	WR	NO	RC	SP	PD	MR	WE	LC	OE	RD	MA	WL	OL	TA	
101	101	101	101	101	100	101	100	101	100	101	101	101	101	101	101
102	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
103	102	102	102	102	101	102	101	102	101	102	102	102	102	102	103
104	102	102	103	102	102	103	102	103	102	103	103	102	103	103	104
105	103	103	103	103	102	103	102	103	102	103	103	103	103	104	105
106	104	103	104	103	103	104	102	104	102	104	104	103	104	105	106
107	104	104	105	104	103	105	103	105	103	105	105	104	104	105	107
108	105	105	105	104	104	106	103	105	103	105	105	104	105	106	108
109	106	105	106	105	104	106	104	106	104	106	106	105	106	107	109
110	106	106	107	105	105	107	104	107	104	107	107	105	106	108	110
111	107	106	107	106	105	108	104	107	104	107	107	106	107	108	111
112	107	107	108	106	106	108	105	108	105	108	108	106	108	109	112
113	108	108	109	107	106	109	105	109	105	109	109	107	108	110	113
114	109	108	109	107	107	110	106	109	106	109	109	107	109	111	114
115	109	109	110	108	107	110	106	110	106	110	110	108	109	111	115
116	110	109	111	108	108	111	106	111	106	111	111	108	110	112	116
117	111	110	111	109	108	112	107	111	107	111	111	109	111	113	117
118	111	110	112	109	109	112	107	112	107	112	112	109	111	114	118
119	112	111	113	110	109	113	107	113	108	113	113	110	112	114	119
120	112	112	113	110	110	114	108	113	108	114	114	110	113	115	120
121	113	112	114	111	110	114	108	114	109	114	114	111	113	116	121
122	114	113	115	111	111	115	109	115	109	115	115	111	114	117	122
123	114	113	115	112	111	116	109	115	109	116	116	112	115	117	123
124	115	114	116	112	112	117	109	116	110	116	116	112	115	118	124
125	115	114	117	113	112	117	110	117	110	117	117	113	116	119	125
126	116	115	117	113	113	118	110	117	111	118	118	113	116	120	126
127	117	116	118	114	113	119	111	118	111	118	118	114	117	121	127
128	117	116	119	114	114	119	111	119	111	119	119	115	118	121	128
129	118	117	119	115	114	120	111	119	112	120	120	115	118	122	129
130	119	117	120	115	115	121	112	120	112	120	120	116	119	123	130
131	119	118	121	116	115	121	112	121	113	121	121	116	120	124	131
132	120	119	121	116	116	122	113	121	113	122	122	117	120	124	132
133	120	119	122	117	116	123	113	122	113	122	122	117	121	125	133
134	121	120	123	117	117	123	113	123	114	123	123	118	121	126	134
135	122	120	123	118	117	124	114	123	114	124	124	118	122	127	135
136	122	121	124	118	118	125	114	124	115	124	124	119	123	127	136
137	123	121	125	119	118	125	115	125	115	125	125	119	123	128	137
138	123	122	125	119	119	126	115	125	115	126	126	120	124	129	138
139	124	123	126	120	119	127	115	126	116	126	126	120	125	130	139
140	125	123	127	120	120	128	116	127	116	127	127	121	125	130	140
141	125	124	128	121	120	128	116	127	117	128	128	121	126	131	141
142	126	124	128	121	121	129	117	128	117	128	128	122	127	132	142
143	127	125	129	122	121	130	117	129	117	129	129	122	127	133	143
144	127	125	130	122	122	130	117	129	118	130	130	123	128	133	144
145	128	126	130	123	122	131	118	130	118	130	130	123	128	134	145
146	128	127	131	124	123	132	118	131	119	131	131	124	129	135	146
147	129	127	132	124	123	132	119	131	119	132	132	124	130	136	147
148	130	128	132	125	124	133	119	132	119	132	132	125	130	136	148
149	130	128	133	125	124	134	119	133	120	133	133	125	131	137	149
150	131	129	134	126	125	134	120	133	120	134	134	126	132	138	150
151	132	130	134	126	125	135	120	134	121	134	134	126	132	139	151
152	132	130	135	127	125	136	120	135	121	135	135	127	133	140	152
153	133	131	136	127	126	137	121	135	122	136	136	127	133	140	153
154	133	131	136	128	126	137	121	136	122	137	136	128	134	141	154
155	134	132	137	128	127	138	122	137	122	137	137	128	135	142	155
156	135	132	138	129	127	139	122	137	123	138	138	129	135	143	156
157	135	133	138	129	128	139	122	138	123	139	138	130	136	143	157
158	136	134	139	130	128	140	123	139	124	139	139	130	137	144	158
159	136	134	140	130	129	141	123	139	124	140	140	131	137	145	159
160	137	135	140	131	129	141	124	140	124	141	141	131	138	146	160

The practitioner must take into account the statistical significance and the base rate of the difference scores. Table 6 provides the required differences between the predicted and obtained WIAT-II<sup>UK</sup> subtest and composite scores to attain statistical significance (critical values) at the .05 and .01 levels. Select the desired level of statistical significance and note it for your records. Using Table 6, find the desired level of

significance. For each subtest or composite, read across the row to the appropriate column to determine the critical value, and record it. The absolute value of the child's difference score must equal or exceed that critical value to be statistically significant. Determine whether or not the absolute value of the child's difference score equals or exceeds the corresponding critical value.

**Table 6: Differences Between Predicted and Obtained WIAT-II<sup>UK</sup> Subtest and Composite Scores Required for Statistical Significance (Critical Values): Predicted-Difference Method using WISC-IV<sup>UK</sup> GAI**

Subtest/Composite	Significance level	Difference
Word Reading	.05	6.67
	.01	8.78
Numerical Operations	.05	7.79
	.01	10.25
Reading Comprehension	.05	7.35
	.01	9.68
Spelling	.05	6.94
	.01	9.13
Pseudoword Decoding	.05	6.39
	.01	8.41
Math Reasoning	.05	8.21
	.01	10.81
Written Expression	.05	7.30
	.01	9.62
Listening Comprehension	.05	10.56
	.01	13.90
Oral Expression	.05	7.38
	.01	9.72
Reading Comprehension	.05	6.52
	.01	8.58
Mathematics	.05	7.37
	.01	9.70
Written Language	.05	6.96
	.01	9.17
Oral Language	.05	8.51
	.01	11.20
Total	.05	6.68
	.01	8.79

If comparison of the predicted and obtained WIAT-II<sup>UK</sup> subtest and composite scores indicates a significant difference, the practitioner should then judge how rare the difference is in the general population. Table 7 provides the cumulative frequency of discrepancies between the predicted and obtained WIAT-II<sup>UK</sup> subtest and composite scores in the WISC-IV<sup>UK</sup> standardisation sample (base rate). Locate the subtest or

composite of interest in the extreme left column, and read across the row to locate the child's difference score. The column header above the child's difference score indicates the percentage of the theoretical normal distribution (base rates) that represents the percentage of the sample that obtained WIAT-II<sup>UK</sup> scores lower than their WISC-IV<sup>UK</sup> GAI scores by the specified amount or more.

**Table 7 Differences Between Predicted and Obtained WIAT-II<sup>UK</sup> Subtest and Composite Scores for Various Percentages of the Theoretical Normal Distribution (Base Rates): Predicted-Difference Method Using WISC-IV<sup>UK</sup> GAI**

Percentages of the Theoretical Normal Distribution (Base Rates)									
Subtest/Composite	25	20	15	10	5	4	3	2	1
Word Reading	8	10	12	15	19	20	21	23	26
Numerical Operations	9	12	14	18	23	24	26	29	32
Reading Comprehension	9	11	13	16	21	22	24	26	29
Spelling	9	11	13	16	21	23	24	26	30
Pseudoword Decoding	8	10	13	16	20	21	23	25	29
Math Reasoning	7	9	11	13	17	18	19	21	24
Written Expression	14	17	21	26	33	35	38	41	47
Listening Comprehension	7	8	10	13	17	18	19	21	23
Oral Expression	11	14	18	22	28	30	32	35	40
Reading	8	10	12	15	19	20	22	24	27
Mathematics	8	10	13	16	20	22	23	25	29
Written Language	11	13	16	20	26	27	29	32	36
Oral Language	8	10	13	16	20	21	23	25	29
Total	7	8	10	13	17	18	19	21	23

Note: Percentages in Table 7 represent the theoretical proportion of WIAT-II<sup>UK</sup> scores lower than WISC-IV<sup>UK</sup> GAI scores by the specified amount or more.

## Simple-Difference Method

Table 8 provides the required differences between WISC-IV<sup>UK</sup> GAI scores and WIAT-II<sup>UK</sup> subtest and composite scores to attain statistical significance (critical values) at the .05 and .01 levels. Select the desired level of statistical significance and note it for your records. Using Table 8, find the age group of the child and the desired level of significance. For each subtest

or composite, read across the row to the appropriate column to determine the critical value, and record it. The absolute value of the child's difference score must equal or exceed that critical value to be statistically significant. Determine whether or not the absolute value of the child's difference score equals or exceeds the corresponding critical value.

**Table 8 Differences Between WISC-IV<sup>UK</sup> GAI Scores and WIAT-II<sup>UK</sup> Subtest and Composite Scores Required for Statistical Significance (Critical Values): Simple-Difference Method**

Subtest/Composite	Significance level	Difference
Word Reading	.05	8
	.01	10
Numerical Operations	.05	11
	.01	14
Reading Comprehension	.05	9
	.01	12
Spelling	.05	9
	.01	12
Pseudoword Decoding	.05	8
	.01	10
Math Reasoning	.05	10
	.01	13
Written Expression	.05	12
	.01	16
Listening Comprehension	.05	14
	.01	19
Oral Expression	.05	12
	.01	16
Reading Comprehension	.05	7
	.01	9
Mathematics	.05	9
	.01	12
Written Language	.05	9
	.01	12
Oral Language	.05	11
	.01	15
Total	.05	7
	.01	9

If comparison of the WISC-IV<sup>UK</sup> GAI score and the WIAT-II<sup>UK</sup> subtest and composite scores indicates a significant difference, the practitioner should then judge how rare the difference is in the general population. Table 9 provides the cumulative frequency of discrepancies between the WISC-IV<sup>UK</sup> GAI and WIAT-II<sup>UK</sup> subtest and composite scores in the WISC-IV<sup>UK</sup> standardisation sample (base rates). Locate the

subtest or composite of interest in the extreme left column, and read across the row to locate the child's difference score. The column header above the child's difference score indicates the percentage of the theoretical normal distribution (base rate) that represents the percentage of the sample that obtained WIAT-II<sup>UK</sup> scores lower than their WISC-IV<sup>UK</sup> GAI scores by the specified amount or more.

**Table 9 Differences Between WISC-IV<sup>UK</sup> GAI Scores and WIAT-II<sup>UK</sup> Subtest and Composite Scores for Various Percentages of the Theoretical Normal Distribution (Base Rates): Simple-Difference Method**

Percentages of the Theoretical Normal Distribution (Base Rates)									
Subtest/Composite	25	20	15	10	5	4	3	2	1
Word Reading	9	11	14	17	22	23	25	27	31
Numerical Operations	9	12	14	18	23	24	26	28	32
Reading Comprehension	8	10	13	16	20	21	23	25	28
Spelling	10	12	15	19	24	26	28	30	35
Pseudoword Decoding	10	13	16	19	25	27	28	31	35
Math Reasoning	8	10	12	15	19	21	22	24	28
Written Expression	11	14	17	21	27	29	31	34	38
Listening Comprehension	8	10	13	16	20	21	23	25	29
Oral Expression	11	14	17	21	27	29	31	34	38
Reading	8	10	13	15	20	21	23	25	28
Mathematics	8	10	13	15	20	21	23	25	28
Written Language	10	12	15	19	24	26	28	30	34
Oral Language	9	11	13	16	21	23	24	26	30
Total	7	9	11	13	17	18	20	21	24

Note: Percentages in Table 9 represent the theoretical proportion of WIAT-II<sup>UK</sup> scores lower than WISC-IV<sup>UK</sup> GAI scores by the specified amount or more.

## Conclusion

This technical report has provided an overview of the GAI, historical context for the development of the GAI, and recommended procedures for determining and interpreting the GAI. This report also has provided recommended procedures for the use of the GAI in ability-achievement comparisons. The GAI provides important information regarding a child's cognitive functioning, but it should never be interpreted in isolation. It is best interpreted in conjunction with a thorough history and careful clinical observations of the child. Many

additional sources of information are typically available to the practitioner: medical, educational, and psychosocial history gathered from both the child and collateral informants, when appropriate; direct behavioral observations; previous test scores; qualitative aspects of test performance; and results from other relevant instruments given in a battery. In addition, the practitioner should evaluate results within the context of the referral question or purpose of the evaluation.

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