Woodcock-Johnson® III

Assessment Service Bulletin Number 3

Use of the WJ III® Discrepancy Procedures for Learning Disabilities Identification and Diagnosis

Nancy Mather, PhD

Fredrick A. Schrank, PhD

The WJ III batteries are designed to provide the most valid methods for determining patterns of strengths and weaknesses based on actual discrepancy norms. Because all of the WJ III tests are co-normed, comparisons among and between an individual's general intellectual ability (g), specific cognitive abilities, oral language, and achievement scores can be made with greater accuracy and validity than would be possible by comparing scores from separately normed instruments. Several discrepancy procedures are available with the WJ III. This Assessment Service Bulletin provides distinctions among the various discrepancy procedures and differentiates the purposes of each for the assessment of individuals with learning disabilities.

Riverside Publishing

A HOUGHTON MIFFLIN COMPANY

Supervising Editor: Melanie A. Bartels Graw

Editor: Carissa Kowalski

Reference Citations

- To cite this document, use:

  Mather, N., & Schrank, F. A. (2001). *Use of the WJ III Discrepancy Procedures for Learning Disabilities Identification and Diagnosis* (Woodcock-Johnson III Assessment Service Bulletin No. 3). Itasca, IL: Riverside Publishing.

For technical information, please call 1.800.323.9540 or visit our website at www.woodcock-johnson.com

1 2 3 4 5 6 7 8 9 10-KMP-05 04 03 02 01 00

Use of the WJ III® Discrepancy Procedures for Learning Disabilities Identification and Diagnosis

The *Woodcock-Johnson® III* (WJ III) (Woodcock, McGrew, & Mather, 2001a) consists of two assessment batteries: the *WJ III Tests of Cognitive Abilities* (WJ III COG) (Woodcock, McGrew, & Mather, 2001c) and the *WJ III Tests of Achievement* (WJ III ACH) (Woodcock, McGrew, & Mather, 2001b). The WJ III COG and WJ III ACH were normed together. This co-norming allows the batteries to function together, providing the examiner with procedures for evaluating the presence and significance of several types of discrepancies. These discrepancy procedures are useful in the evaluation of individuals with learning disabilities.

The WJ III can be used as a diagnostic system for comparing domain-specific skills with related cognitive abilities; it can also be used to determine ability/achievement discrepancies. Consequently, two basic types of discrepancy procedures can be derived from the WJ III: (a) intra-ability (discrepancies among abilities) and (b) ability/achievement (discrepancies between a predictor score and measured academic performance). This document explains how these procedures differ and suggests that the choice of discrepancy model selected for use will depend upon the assessment purpose (or purposes).

Discrepancy scores obtained from the WJ III are actual discrepancies, not estimated discrepancies, because the WJ III allows for direct comparisons of actual scores between measures.[1] These comparisons are not possible when scores are obtained from different batteries (i.e., not co-normed). Because all norms for the WJ III COG and the WJ III ACH are based on data from the same sample, examiners can report discrepancies between and among an individual's WJ III scores without using estimated discrepancies. The WJ III discrepancy procedures are psychometrically preferable to estimated discrepancies for at least two important reasons. First, the WJ III discrepancies do not contain the errors associated with estimated discrepancies (estimated discrepancy procedures do not control for unknown differences that exist when using two tests based on different norming samples). Second, the discrepancy procedures used by the *WJ III Compuscore® and Profiles Program* (Schrank & Woodcock, 2001) incorporate specific regression coefficients between all predictor and criterion variables at each age level to provide the best estimates of the population characteristics. These regression coefficients are based on a large, representative, national sample of 8,818 subjects. In contrast, estimated discrepancy procedures are typically based on small samples (often less than 100) of limited generalizability (the samples are often restricted in range of ability).

[1] Two scores help examiners interpret the presence and severity of the discrepancies: the *discrepancy percentile rank* (DISCREPANCY PR) and the *discrepancy standard deviation* (DISCREPANCY SD). The DISCREPANCY PR reflects the percent of the population that possesses a discrepancy of that magnitude, such as 5% or 7%. The DISCREPANCY SD is a standardized *z* score that changes the same discrepancy into standard deviation units, such as a criterion of ±1.5 standard deviations.

Intra-Ability Discrepancies

The intra-ability discrepancy procedures are based on the practice of examining test performance to determine patterns of strengths and weaknesses. Because of the breadth of cognitive and academic abilities covered, the WJ III is well suited for this type of analysis. This type of examination of test performance is frequently recommended, as suggested by the following quotation from the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 1999):

> Because each test in a battery examines a different function, ability, skill, or combination thereof, the test taker's performance can be understood best when scores are not combined or aggregated, but rather when each score is interpreted within the context of all other scores and assessment data. For example, low scores on timed tests alert the examiner to slowed responding as a problem that may not be apparent if scores on different kinds of tests are combined. (p. 123)

The WJ III provides three intra-ability discrepancy procedures: (a) intra-individual, (b) intra-cognitive, and (c) intra-achievement. The three intra-ability discrepancies are bidirectional comparisons. Each ability is compared to the average of all of the other abilities in the comparison. For example, equal interest exists in the individual who demonstrates a strength in fluid reasoning, but a weakness in short-term memory, and an individual who has a strength in short-term memory, but a weakness in fluid reasoning. Similarly, equal interest exists in the child who has a strength in mathematics, but a weakness in reading, and the child who has a strength in reading, but a weakness in mathematics. Figure 1 displays the nature of the bidirectional comparisons used in the three intra-ability discrepancy procedures.

Although each of the WJ III discrepancy procedures can be a useful part of a comprehensive learning-disabilities assessment, in many cases the intra-individual discrepancy procedure will be the single most useful procedure for diagnosis and instructional planning. In California, Louisiana, and many other states, there are alternatives to the ability/achievement discrepancy model for establishing the presence of a learning disability. The intra-individual discrepancy procedure is suggested as a procedure that will allow professionals to develop a solid case for identifying a learning disability in the absence of an ability/achievement discrepancy or to corroborate a diagnosis made on the basis of an ability/achievement discrepancy.

The intra-individual discrepancy procedure allows examiners to analyze an individual's cognitive and achievement scores across the clusters of the WJ III COG and WJ III ACH and to explore co-varying cognitive and achievement strengths and weaknesses. Each cognitive ability and achievement area of interest is compared to the average of all other abilities. This analysis is particularly useful in the identification of a specific learning disability because the evaluator needs to determine what is “specific” about the problem. In other words, does this child struggle with spelling but not with math computation? If so, what cognitive abilities might be contributing to the spelling difficulties? Or, is the child an avid reader, but has substantial difficulty performing mathematical computations? If so, the overall pattern of cognitive and achievement strengths and weaknesses can be used to help determine why the child is struggling with mathematics and, subsequently, what type of intervention is needed. The intra-individual discrepancy procedure is similar to the approach recommended by Fletcher et al. (1998), who advocated that examiners evaluate domain-specific achievement skills conjointly with the related cognitive abilities. Because this procedure can be used with several combinations of clusters from the

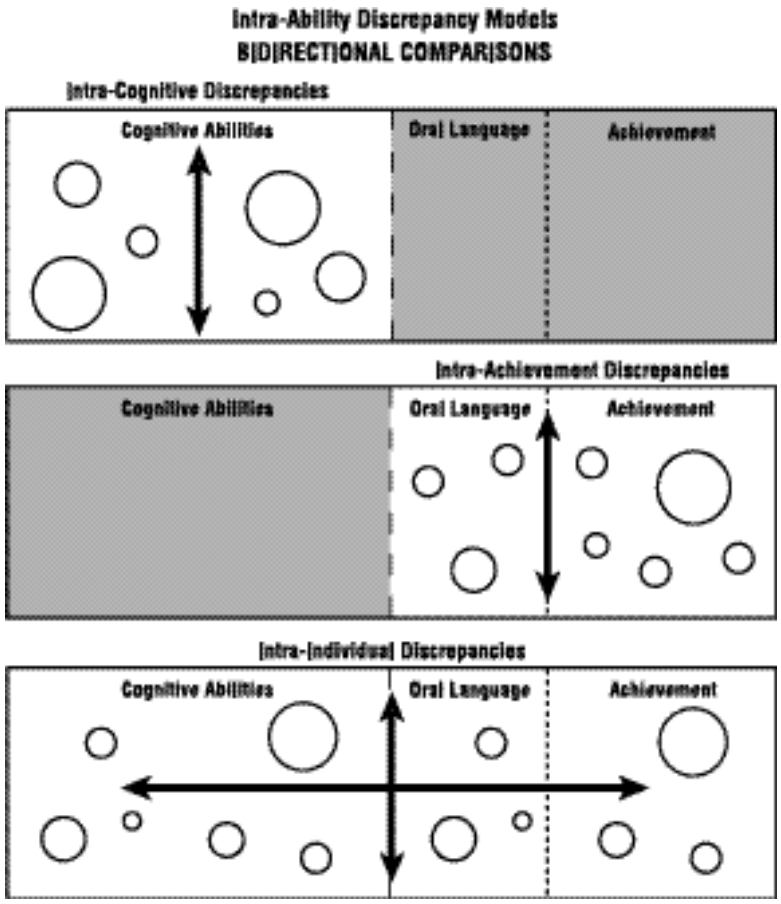

Figure 1.
Three types of intra-ability discrepancy procedures in the WJ III.

WJ III COG and WJ III ACH, it is particularly adaptable to a broad range of tailored and comprehensive assessments. Table 1 includes four sets of tests that may be used in calculating intra-individual discrepancies. In each of the four options, the tests that compose each interpretive cluster must be administered to obtain intra-individual discrepancies from the Compuscore and Profiles Program.

The intra-individual discrepancy analysis can help an examiner determine and document both strengths and weaknesses in learning abilities, as well as define how these abilities are related to the individual's learning difficulties. For example, a reading problem may be caused by some underlying condition (such as poor phonological awareness or poor memory) that may affect others areas as well (e.g., memorization of math facts). As noted by Scarborough (1991), cognitive and achievement weaknesses can be viewed as successive, observable symptoms of the same condition. Figure 2 shows how these abilities can be analyzed together in the intra-individual discrepancies section of the Compuscore and Profiles Program "Table of Scores." This example uses the set of clusters from the extended batteries of the WJ III COG and the WJ III ACH.

The intra-individual discrepancy procedure is most appropriate when the purposes of the assessment are to determine why the student has had difficulty, to explain how the difficulty relates to academic performance, and to select appropriate interventions. This procedure is in line with current conceptualizations of multiple intelligence specifying that different cognitive processing capacities are related to solving different types of problems (Fletcher et al., 1998). For example, using this discrepancy procedure could help an examiner detect a pattern of cognitive/linguistic weaknesses that is reflected in an

Table 1.
WJ III Intra-Individual Discrepancies

INTRA-INDIVIDUAL DISCREPANCIES	
Standard ACH/Standard COG	**Extended ACH/Standard COG**
Verbal Ability	Verbal Ability
Thinking Ability	Thinking Ability
Cognitive Efficiency	Cognitive Efficiency
Broad Reading	Basic Reading Skills
Broad Math	Reading Comprehension
Broad Written Language	Math Calculation Skills
Oral Language–Std	Math Reasoning
	Basic Writing Skills
	Written Expression
	Oral Expression
	Listening Comprehension
	Academic Knowledge
Standard ACH/Extended COG	**Extended ACH/Extended COG**
Comprehension-Knowledge (*Gc*)	Comprehension-Knowledge (*Gc*)
Long-Term Retrieval (*Glr*)	Long-Term Retrieval (*Glr*)
Visual-Spatial Thinking (*Gv*)	Visual-Spatial Thinking (*Gv*)
Auditory Processing (*Ga*)	Auditory Processing (*Ga*)
Fluid Reasoning (*Gf*)	Fluid Reasoning (*Gf*)
Processing Speed (*Gs*)	Processing Speed (*Gs*)
Short-Term Memory (*Gsm*)	Short-Term Memory (*Gsm*)
{Phonemic Awareness}*	{Phonemic Awareness}*
{Working Memory}**	{Working Memory}**
Broad Reading	Basic Reading Skills
Broad Math	Reading Comprehension
Broad Written Language	Math Calculation Skills
Oral Language–Std	Math Reasoning
	Basic Writing Skills
	Written Expression
	Oral Expression
	Listening Comprehension
	Academic Knowledge

* Phonemic Awareness is not required for calculation of intra-individual discrepancies. The Phonemic Awareness score is not included in the "Other" score calculated for the other clusters. The Phonemic Awareness score is compared to the same "Other" score as Auditory Processing (*Ga*).

** Working Memory is not required for calculation of intra-individual discrepancies. The Working Memory score is not included in the "Other" score calculated for the other clusters. The Working Memory score is compared to the same "Other" score as Short-Term Memory (*Gsm*).

individual's listening comprehension, reading comprehension, and written expression. At the same time, a pattern of strengths may be noted in fluid reasoning, math calculation, and math reasoning. In addition, the intra-individual discrepancy procedure can be particularly useful in identifying a learning difficulty early, rather than waiting until a child has failed several years in school and he or she finally demonstrates a discrepancy between an ability and an achievement measure.

Examiners who use either the WJ III COG or the WJ III ACH by itself can still use an intra-ability discrepancy procedure using certain combinations of interpretive clusters available in each of the standard and extended batteries. Table 2 defines the clusters that can be included in the intra-cognitive discrepancy procedure. The intra-cognitive

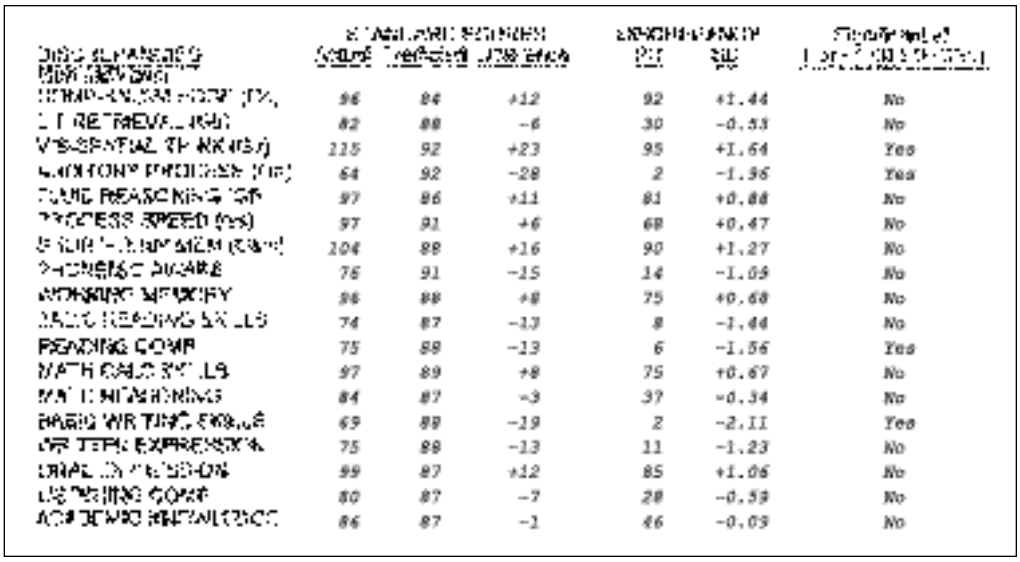

Figure 2.
Intra-individual discrepancies from the Compuscore and Profiles Program "Table of Scores."

discrepancy procedure is particularly useful in identifying information-processing strengths and weaknesses. Many states and school districts require documentation of a processing disorder for learning disabilities services. The intra-cognitive discrepancy procedure can be used for this purpose and is consistent with Brackett and McPherson's (1996) suggestion that "[a] major value of detecting severe discrepancies within and between areas of cognition is the focus on cognitive processing components of learning disabilities" (p. 79).

As with the intra-cognitive discrepancy, the intra-achievement discrepancy allows an evaluator to examine strengths and weaknesses among areas of achievement. Table 3 defines the clusters that can be included in the intra-achievement discrepancy procedure.

Table 2.
WJ III Intra-Cognitive Discrepancies

INTRA-COGNITIVE DISCREPANCIES	
Standard	**Extended**
Verbal Ability	Comprehension-Knowledge (*Gc*)
Thinking Ability	Long-Term Retrieval (*Glr*)
Cognitive Efficiency	Visual-Spatial Thinking (*Gv*)
	Auditory Processing (*Ga*)
	Fluid Reasoning (*Gf*)
	Processing Speed (*Gs*)
	Short-Term Memory (*Gsm*)
	{Phonemic Awareness}*
	{Working Memory}**

* Phonemic Awareness is not required for calculation of intra-cognitive discrepancies. The Phonemic Awareness score is not included in the "Other" score calculated for the other clusters. The Phonemic Awareness score is compared to the same "Other" score as Auditory Processing (*Ga*).

** Working Memory is not required for calculation of intra-cognitive discrepancies. The Working Memory score is not included in the "Other" score calculated for the other clusters. The Working Memory score is compared to the same "Other" score as Short-Term Memory (*Gsm*).

Table 3.
WJ III Intra-Achievement Discrepancies

INTRA-ACHIEVEMENT DISCREPANCIES	
Standard	**Extended**
Broad Reading	Basic Reading Skills
Broad Math	Reading Comprehension
Broad Written Language	Math Calculation Skills
Oral Language–Std	Math Reasoning
	Basic Writing Skills
	Written Expression
	Oral Expression
	Listening Comprehension
	Academic Knowledge

Ability/Achievement Discrepancies

The WJ III provides procedures for evaluating three types of ability/achievement discrepancies: (a) intellectual ability/achievement, (b) predicted achievement/achievement, and (c) oral language ability/achievement. The first procedure uses a global score; the second procedure provides a more refined predictor; the third procedure permits a more circumscribed application. These discrepancy procedures are unidirectional—that is, only certain cognitive abilities are used to predict achievement—achievement is not used to predict cognitive ability. Figure 3 illustrates the nature of the unidirectional comparisons used in the WJ III ability/achievement discrepancy procedures. The following section describes how the intent of each of these procedures differs.

Intellectual Ability/Achievement Procedure. An intellectual ability/achievement procedure is available using a general intellectual ability (*g*) score as the predictor across achievement domains. Either the General Intellectual Ability–Standard (GIA–Std) or General Intellectual Ability–Extended (GIA–Ext) score can be used as the ability measure. This procedure may be useful when a generalized measure of cognitive functioning is required. The GIA–Std is derived from the first seven tests in the WJ III COG. Each of the

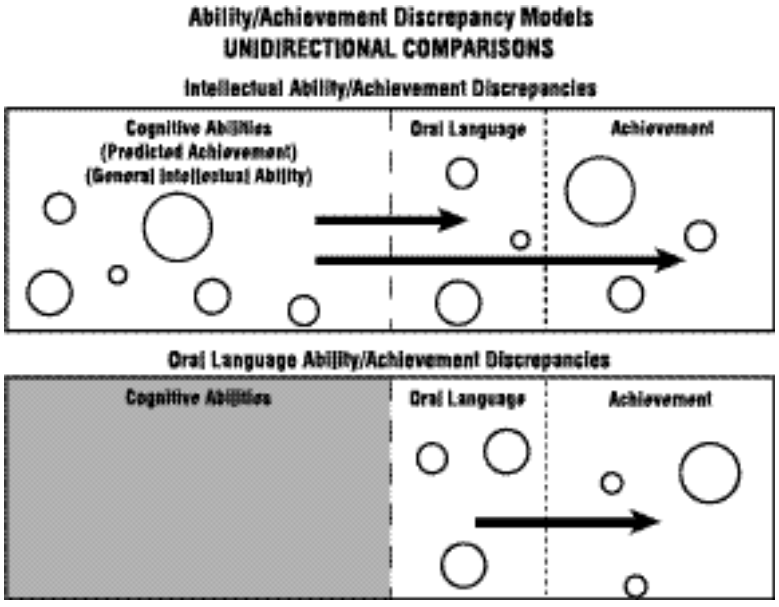

Figure 3.
Two types of ability/achievement discrepancy models in the WJ III.

seven tests represents a different Cattell-Horn-Carroll (CHC) broad factor (McGrew & Woodcock, 2001). The GIA–Ext score is derived from 14 tests from the standard and extended batteries that also measure the broad CHC factors. The GIA scores are the first principal-component (*g*) measures obtained from principal-component analyses. Each GIA score is a weighted combination of cognitive tests that accounts for the largest portion of variance in the component tests. The GIA score represents a common ability underlying all intellectual performance.

General intellectual ability (*g*) is a theoretical postulate. The "little *g*" represents a distillation of cognitive abilities in a common factor underlying all test performance (Jensen, 1998). The general factor is also identified as Stratum 3 in Carroll's three-stratum model of human cognitive abilities (Carroll, 1993). The psychological nature of *g* is uncertain because it cannot be defined by test content. However, *g* scores have broad practical utility, as they will often be the best single-score predictor of various global criteria such as overall school achievement or other life outcomes that have some relationship to cognitive ability. In addition to the theoretical basis, the general intellectual ability/achievement discrepancies address certain language in federal legislation and nosological criteria that requires "a severe discrepancy between achievement and intellectual ability" as part of the eligibility criteria for learning disabilities services. Computer scoring makes calculation of general intellectual ability, or *g*, practical. Each test included in the GIA score is weighted to provide the best estimate of *g*. In contrast, tests like the Wechsler intelligence scales or the *Woodcock-Johnson Psycho-Educational Battery–Revised* (WJ-R®) (Woodcock & Johnson, 1989) weight all subtests equally, which may not provide the best estimate of general intelligence. In general, the WJ III tests that measure *Gc* (Verbal Comprehension and General Information) and *Gf* (Concept Formation and Analysis Synthesis) are among the highest *g*-weighted tests, a finding that is consistent with the extant factor-analytic research on *g* (Carroll, 1993). Table 4 provides the average GIA weights by age group. A review of the weights in Table 4 reveals that the weights for the individual tests do not vary much as a function of age.

The WJ III GIA scores correlate well with other intelligence tests. These correlations provide support for use of the WJ III GIA scores in intellectual ability/achievement discrepancy evaluations required in federal legislation. Table 5 contains the correlations from several criterion validity studies for the WJ III COG GIA score. Details of these studies are found in the WJ III *Technical Manual* (McGrew & Woodcock, 2001). For the WJ III COG, scores were compared with performance on other intellectual measures appropriate for individuals at the ages tested. Correlations with the *Wechsler Intelligence Scale for Children–Third Edition* (WISC-III) (Wechsler, 1991) are reported as .71 for the GIA–Std and .76 for the GIA–Ext. Correlations with the *Differential Ability Scales* (DAS) (Elliot, 1990) General Conceptual Ability (GCA) are similar (.72 for the GIA–Std, .74 for the GIA–Ext). Results of a study using the *Stanford-Binet Intelligence Scale–Fourth Edition* (SB-IV) (Thorndike, Hagen, & Sattler, 1986) at the preschool level show correlations with the overall composite score to be .76 for the GIA–Std and .71 for the GIA–Ext. Because these correlations are based on samples of restricted age and ability ranges, they are somewhat underestimated.

Predicted Achievement/Achievement Procedure. In the WJ-R, this comparison was labeled as the "scholastic aptitude/achievement" discrepancy procedure. In the WJ III, the procedure has been renamed the predicted achievement/achievement discrepancy procedure. The new name more clearly conveys the purpose of the procedure: to predict an individual's academic performance in the near-term, based on his or her current levels of associated cognitive abilities. The new name also differentiates this type of procedure from the intellectual ability/achievement and the oral language ability/achievement discrepancy procedures.

Table 4.
General Intellectual Ability (GIA) Average (Smoothed) g *Weights by Technical Age Group*

	AGE												
	2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
General Intellectual Ability–Std													
Verbal Comprehension	0.19	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Visual-Auditory Learning	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Spatial Relations	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Sound Blending	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Concept Formation	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.19
Visual Matching	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Numbers Reversed	0.17	0.16	0.16	0.15	0.15	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13
General Intellectual Ability–Ext													
Verbal Comprehension	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13
Visual-Auditory Learning	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Spatial Relations	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sound Blending	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Concept Formation	0.08	0.08	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11
Visual Matching	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Numbers Reversed	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
General Information	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11
Retrieval Fluency	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06
Picture Recognition	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Auditory Attention	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03
Analysis-Synthesis	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Decision Speed	0.08	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05
Memory for Words	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06

The predicted achievement discrepancy option is empirically (rather than theoretically) derived. Each Predicted Achievement score is based on test weights that vary developmentally. The weights represent the best statistical relationship between the cognitive abilities most related to an area of academic achievement at any given point in development. In the prediction of reading, the abilities weighted the most at grade 1 differ from the abilities weighted most during the secondary years. For example, in the early grades Sound Blending—a measure of phonetic coding—is weighted more heavily than some other cognitive abilities. As students advance in school years, Verbal Comprehension—a measure of language and knowledge—increases in importance and, consequently, is more heavily weighted.

Federal law dictates the criteria for special education eligibility. The primary criterion used for identification of a learning disability is a discrepancy between aptitude (described as potential for school success) and achievement (equated with present levels of academic performance). In other words, a specific learning disability is characterized as

Table 4. *(cont.)*
General Intellectual Ability (GIA) Average (Smoothed) g *Weights by Technical Age Group*

	AGE											
	15	**16**	**17**	**18**	**19**	**20–29**	**30–39**	**40–49**	**50–59**	**60–69**	**70–79**	**80+**
General Intellectual Ability–Std												
Verbal Comprehension	0.20	0.20	0.19	0.19	0.19	0.18	0.17	0.17	0.17	0.17	0.17	0.17
Visual-Auditory Learning	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17
Spatial Relations	0.09	0.10	0.10	0.11	0.11	0.13	0.12	0.11	0.11	0.10	0.10	0.10
Sound Blending	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10
Concept Formation	0.19	0.19	0.19	0.19	0.18	0.18	0.17	0.17	0.16	0.15	0.15	0.15
Visual Matching	0.10	0.10	0.10	0.10	0.10	0.11	0.13	0.14	0.14	0.15	0.15	0.15
Numbers Reversed	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.15	0.16
General Intellectual Ability–Ext												
Verbal Comprehension	0.13	0.12	0.12	0.12	0.12	0.12	0.11	0.10	0.10	0.10	0.10	0.10
Visual-Auditory Learning	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09
Spatial Relations	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.06
Sound Blending	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06
Concept Formation	0.11	0.11	0.11	0.11	0.11	0.10	0.09	0.09	0.08	0.08	0.08	0.07
Visual Matching	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.08	0.09
Numbers Reversed	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08
General Information	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.09	0.09	0.09	0.09	0.09
Retrieval Fluency	0.06	0.05	0.05	0.05	0.05	0.05	0.07	0.08	0.07	0.07	0.06	0.06
Picture Recognition	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Auditory Attention	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.05	0.05	0.05
Analysis-Synthesis	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09
Decision Speed	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.08	0.08	0.08
Memory for Words	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.05	0.04	0.04	0.04

"unexpected" or "unexplained" poor performance based upon observations of the child's other capabilities. The WJ III Predicted Achievement clusters are designed to document unexpected poor performance. They are not designed, nor is any other intellectual battery designed, to estimate a student's "potential" for future school success. The predicted achievement/achievement discrepancy calculation is accomplished by comparing performance on a mix of the cognitive tasks most highly associated with performance in a particular academic area. In other words, the intent is to determine if the person is performing as well as one would expect, *given his or her measured levels of associated cognitive abilities*, not to diagnose the existence of a learning disability. Consequently, the predicted achievement/achievement discrepancy procedure may not be appropriate (in many cases) for determining a specific learning disability.

Students with specific learning disabilities may not exhibit a predicted achievement/achievement discrepancy because a weak cognitive ability or abilities are reflected in a lower predicted achievement score. This phenomenon occurs because the

Table 5.
Correlations From Several Criterion Validity Studies for the WJ III COG General Intellectual Ability (GIA) Score

Criterion	MEDIAN CORRELATIONS	
	GIA–Std	GIA–Ext
Differential Ability Scales	.72	.74
Wechsler Preschool and Primary Scales of Intelligence–Revised	.73	.74
Stanford-Binet Intelligence Scales–Fourth Edition	.76	.71
Wechsler Intelligence Scale for Children–Third Edition	.71	.76
Wechsler Adult Intelligence Scale	.67	—
Kaufman Adolescent and Adult Intelligence Test	.75	—

WJ III Predicted Achievement scores are highly related to associated areas of academic achievement. As stated by Flanagan, McGrew, and Ortiz (2000):

> Specifically, the greater the predictive utility of the aptitude measure . . . the *less likely* a finding of significant ability-achievement discrepancy will be for an individual whose academic skill deficiencies cannot be explained by conative, environmental, instructional, or other (exclusionary) factors. (p. 383)

The WJ III predicted achievement/achievement option is an example of a discrepancy procedure that is "counter to the inherent meaning of an ability-achievement discrepancy found in most federal and state definitions of (and criteria for identifying) learning disabilities" (Flanagan et al., 2000, p. 383). For example, a child with poor basic reading skills may obtain low scores on measures of auditory processing. Thus, the Predicted Achievement score for reading reflects this weakness, and the child may not show a discrepancy between predicted achievement and actual achievement. The Predicted Achievement cluster predicts that the child will struggle with reading, and he or she usually does. When a significant discrepancy exists between predicted achievement and actual achievement, the observed difference suggests that the measured abilities related to the domain (e.g., vocabulary or phonological awareness) are not the factor or factors inhibiting performance. Other extrinsic factors (e.g., lack of proper instruction, economic disadvantage, lack of opportunity to learn, lack of interest, poor instruction, and/or poor motivation) may be the factors most responsible for the observed discrepancy. A discrepancy between predicted and actual achievement suggests that extrinsic factors or other cognitive abilities not included in predicted clusters rather than intrinsic factors (e.g., a specific learning disability) may be contributing to poor performance.

Oral Language Ability/Achievement Procedure. In the field of reading disabilities, one commonly proposed discrepancy model compares oral language abilities with specific domains of academic performance, especially reading. Many individuals with "specific" reading and writing impairments have a discrepancy between oral and written language abilities. In addition to the full-scale score or the predicted achievement procedure in the WJ III COG, the WJ III ACH contains an ability/achievement discrepancy procedure where the Oral Language–Ext cluster is used as the measure of ability. A comparison of oral language abilities to academic performance allows for a more circumscribed prescription of disabilities. Essentially, what distinguishes the individual with a reading disability from other poor readers is that their listening comprehension ability is higher than their ability to decode words (Rack, Snowling, & Olson, 1992), and thus the difficulty is "unexpected." The relevant discrepancy is a comparison between oral language abilities (including listening comprehension and vocabulary) and reading skills

and comprehension, as suggested by Betts as early as the 1940s. One important aspect of a learning disability evaluation is to distinguish children whose problems are specific to one or more cognitive domains from those whose problems result from a more pervasive impairment in language skills, which may be more appropriately classified as an oral language disorder (Fletcher et al., 1998). Children who struggle in most aspects of language, as well as in many non-verbal domains, may be more appropriately classified as having some degree of mental impairment (e.g., mild to moderate mental retardation).

The oral language ability/achievement procedure has particular relevance for helping evaluators distinguish between individuals with adequate oral language capabilities, but poor reading and writing abilities (i.e., specific reading disabilities), and individuals whose oral language abilities are commensurate with present levels of reading and writing performance. In the first case, when oral language performance is higher than reading ability, instructional recommendations would focus on reading and writing development. In the second case, instructional recommendations would be directed to all aspects of language development. A student with a learning disability may or may not exhibit an oral language ability/achievement discrepancy. For example, an older student with reading difficulties may have depressed performance in oral language because of his or her limited experiences with text. This lack of exposure to printed text contributes to reduced knowledge and vocabulary.

As noted by Stanovich (1991a, 1991b), use of an oral language measure to predict reading and writing is often preferable to use of a general intelligence score because it is more in line with the concept of "potential" and "unexpected" failure. Stanovich explains that use of oral language ability as the aptitude measure moves us closer to a more principled definition of reading disability because it provides a more accurate estimate of what the person could achieve if the reading problem were entirely resolved.

To Predict or Diagnose? Two Hierarchies of Discrepancy Procedures

The existence of an ability/achievement discrepancy, in and of itself, is not sufficient for determination of a specific learning disability or as the sole basis for selecting individuals for instructional services. Careful diagnosis of a significant, specific weakness or weaknesses can provide examiners with important documentation for a specific learning disability. Conversely, a lack of an ability/achievement discrepancy may not necessarily mean that the individual does not have a specific learning disability. In some cases, it may mean that the individual is performing as well as can be expected, given his or her current performance on relevant cognitive abilities. Experienced clinicians know this; they have learned to distinguish between prediction and diagnosis. Because the intent of each of the WJ III discrepancy procedures differs, experienced clinicians use the procedure that matches the purpose of the assessment and helps answer the referral question. In general, the ability/achievement discrepancy procedures are intended to predict achievement; the intra-individual discrepancy procedures are intended to diagnose patterns of strengths and weaknesses.

Among the WJ III ability/achievement discrepancy procedures, the most accurate predictor is obtained by using the predicted achievement/achievement discrepancy procedure. Table 6 contains the predictive value, or ability/achievement correlations, for the four WJ III ability/achievement discrepancy procedures for age 6 through adulthood. Across the life span, the predicted achievement option provides the most accurate prediction of reading, mathematics, written language, and academic knowledge. In the prediction of oral language (the Oral Language, Oral Expression, and Listening

Table 6.
Ability/Achievement Predictive Values (Correlations) for the Four Major WJ III Ability/Achievement Discrepancy Options

Cluster	AGE							
	6 to 8 Years				9 to 13 Years			
	Pred. Ach.	GIA–Std	GIA–Ext	Oral Lang.	Pred. Ach.	GIA–Std	GIA–Ext	Oral Lang.
Reading								
Broad Reading	0.75 (485)	0.70 (485)	0.72 (530)	0.62 (214)	0.75 (1,087)	0.70 (1,087)	0.73 (1,087)	0.64 (204)
Basic Reading Skills	0.72 (821)	0.69 (801)	0.70 (530)	0.62 (204)	0.67 (1,726)	0.64 (1,726)	0.65 (1,197)	0.57 (204)
Reading Comprehension	0.73 (799)	0.68 (799)	0.71 (530)	0.67 (204)	0.73 (1,489)	0.68 (1,489)	0.71 (1,197)	0.68 (204)
Mathematics								
Broad Math	0.72 (700)	0.68 (700)	0.70 (530)	0.55 (204)	0.71 (1,726)	0.67 (1,726)	0.69 (1,197)	0.54 (204)
Math Calculation Skills	0.67 (700)	0.60 (700)	0.62 (530)	0.46 (204)	0.67 (1,726)	0.58 (1,726)	0.60 (1,197)	0.42 (204)
Math Reasoning	0.73 (694)	0.71 (694)	0.73 (530)	0.60 (204)	0.74 (1,277)	0.72 (1,277)	0.73 (1,197)	0.60 (204)
Written Language								
Broad Written Language	0.71 (629)	0.66 (629)	0.69 (530)	0.56 (204)	0.72 (1,726)	0.67 (1,726)	0.70 (1,197)	0.58 (204)
Basic Writing Skills	0.68 (748)	0.63 (748)	0.66 (530)	0.54 (204)	0.71 (1,503)	0.67 (1,503)	0.69 (1,197)	0.58 (204
Written Expression	0.69 (629)	0.64 (629)	0.67 (530)	0.55 (204)	0.68 (1,726)	0.63 (1,726)	0.66 (1,197)	0.54 (204)
Language & Knowledge								
Oral Language–Ext	0.68 (204)	0.75 (204)	0.78 (204)	— —	0.65 (488)	0.74 (488)	0.77 (488)	— —
Oral Language–Std	0.67 (204)	0.71 (204)	0.73 (204)	— —	0.64 (488)	0.68 (488)	0.71 (488)	— —
Oral Expression	0.55 (821)	0.62 (821)	0.65 (530)	— —	0.53 (1,726)	0.64 (1,726)	0.67 (1,197)	— —
Listening Comprehension	0.67 (204)	0.72 (204)	0.75 (204)	— —	0.62 (488)	0.68 (488)	0.71 (488)	— —
Academic Knowledge	0.74 (821)	0.66 (821)	0.69 (530)	0.73 (204)	0.78 (1,726)	0.68 (1,726)	0.72 (1,197)	0.75 (204)

Note: Sample sizes shown in parentheses.

Comprehension clusters), the GIA clusters are consistently stronger predictors than the Predicted Achievement clusters. The GIA–Std and GIA–Ext clusters provide the second strongest prediction of reading, mathematics, and written language achievement. With the exception of the prediction of academic knowledge, the Oral Language cluster is a weaker predictor of school achievement than the Predicted Achievement or GIA clusters.

The differences among the predicted achievement/achievement, general intellectual ability/achievement, and oral language/achievement discrepancy options highlight the importance of knowing the purpose of the assessment before selecting which ability/achievement discrepancy procedure to use. Figure 4 provides a hierarchy of predictive power for the WJ III discrepancy procedures. For the traditional academic areas (reading, writing, and mathematics), the predicted achievement procedure provides the

Table 6. *(cont.)*
Ability/Achievement Predictive Values (Correlations) for the Four Major WJ III Ability/Achievement Discrepancy Options

Cluster	AGE											
	14 to 19 Years				20 to 39 Years				40+ Years			
	Pred. Ach.	GIA–Std	GIA–Ext	Oral Lang.	Pred. Ach.	GIA–Std	GIA–Ext	Oral Lang.	Pred. Ach	GIA–Std	GIA–Ext	Oral Lang.
Reading												
Broad Reading	0.78 (993)	0.74 (993)	0.77 (811)	0.68 (448)	0.85 (809)	0.81 (809)	0.84 (754)	0.76 (343)	0.88 (612)	0.84 (612)	0.86 (506)	0.80 (278)
Basic Reading Skills	0.71 (1,383)	0.68 (1,383)	0.70 (811)	0.61 (448)	0.79 (1,147)	0.76 (1,147)	0.78 (754)	0.75 (343)	0.81 (840)	0.76 (840)	0.78 (506)	0.74 (278)
Reading Comprehension	0.76 (1,053)	0.69 (1,053)	0.73 (811)	0.72 (448)	0.82 (827)	0.76 (827)	0.79 (754)	0.81 (343)	0.87 (698)	0.80 (690)	0.82 (506)	0.83 (278)
Mathematics												
Broad Math	0.71 (1,383)	0.67 (1,383)	0.68 (811)	0.58 (448)	0.77 (1,245)	0.75 (1,245)	0.76 (754)	0.67 (343)	0.83 (863)	0.81 (863)	0.82 (506)	0.74 (278)
Math Calculation Skills	0.66 (1,383)	0.59 (1,383)	0.61 (811)	0.48 (448)	0.72 (1,245)	0.69 (1,245)	0.69 (754)	0.57 (343)	0.78 (863)	0.76 (863)	0.57 (506)	0.66 (278)
Math Reasoning	0.74 (1,094)	0.71 (1,094)	0.73 (811)	0.65 (448)	0.79 (934)	0.77 (934)	0.78 (754)	0.73 (343)	0.85 (662)	0.81 (662)	0.83 (506)	0.77 (278)
Written Language												
Broad Written Language	0.76 (1,383)	0.73 (1,383)	0.75 (811)	0.63 (448)	0.83 (1,251)	0.81 (1,251)	0.83 (754)	0.73 (343)	0.85 (863)	0.83 (863)	0.84 (506)	0.76 (278)
Basic Writing Skills	0.71 (1,168)	0.66 (1,168)	0.68 (811)	0.58 (448)	0.81 (904)	0.77 (904)	0.79 (754)	0.74 (343)	0.83 (654)	0.78 (654)	0.80 (506)	0.75 (278)
Written Expression	0.72 (1,383)	0.70 (1,383)	0.72 (811)	0.61 (448)	0.80 (1,251)	0.78 (1,251)	0.80 (754)	0.69 (343)	0.83 (863)	0.81 (863)	0.83 (506)	0.74 (278)
Language & Knowledge												
Oral Language–Ext	0.69 (448)	0.73 (448)	0.76 (448)	— —	0.77 (343)	0.80 (343)	0.83 (343)	— —	0.79 (278)	0.81 (278)	0.83 (278)	— —
Oral Language–Std	0.69 (448)	0.76 (448)	0.80 (448)	— —	0.77 (343)	0.82 (343)	0.86 (343)	— —	0.78 (278)	0.84 (278)	0.87 (278)	— —
Oral Expression	0.58 (1,383)	0.66 (1,383)	0.70 (811)	— —	0.67 (1,251)	0.73 (1,251)	0.77 (754)	— —	0.69 (863)	0.75 (863)	0.78 (506)	— —
Listening Comprehension	0.67 (448)	0.72 (448)	0.75 (448)	— —	0.77 (343)	0.81 (343)	0.83 (343)	— —	0.78 (278)	0.82 (278)	0.83 (278)	— —
Academic Knowledge	0.82 (1,383)	0.70 (1,383)	0.75 (811)	0.77 (448)	0.87 (1,201)	0.77 (1,201)	0.80 (754)	0.84 (343)	0.88 (863)	0.79 (863)	0.82 (506)	0.85 (278)

Note: Sample sizes shown in parentheses.

greatest predictive power for present performance levels, followed by the general intellectual ability options, and then oral language ability.

As noted, the intra-individual, intra-cognitive, and intra-achievement discrepancy procedures are not intended to provide predictive information, but rather to provide diagnostic information. Figure 5 contains a hierarchy of discrepancy procedures by

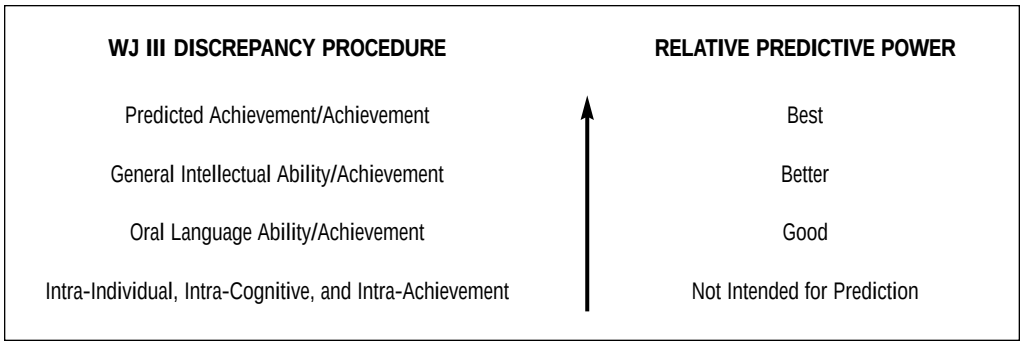

Figure 4.
Hierarchy of predictive power among the WJ III discrepancy procedures.

diagnostic utility. Among the WJ III discrepancy procedures, the greatest diagnostic utility is obtained by using the intra-individual discrepancy procedure. This procedure provides the most informative comparison because it reflects the amount of disparity among all cognitive and academic abilities. These intra-individual variations can be used to substantiate the "unexpectedness" of a difficulty by comparing and contrasting a person's performance in one area to performance in other domains.

Intra-individual discrepancies are the most useful for determining specific learning disabilities because an evaluator can identify domain-specific disabilities. Although useful, the intra-cognitive or intra-achievement discrepancy procedures provide somewhat less diagnostic information, primarily because fewer abilities are included in the discrepancy analysis. The oral language/achievement discrepancy procedure is useful in some applications because the evaluator can determine if a student's oral language abilities differ significantly from performance in specific academic domains. The least diagnostic usefulness is found when using either the general intellectual ability/achievement or the predicted achievement/achievement procedure, because these discrepancy procedures provide little information about an individual's strengths and weaknesses. This shortcoming is not a function of using the WJ III, but is associated with all ability/achievement discrepancy procedures.

Illustration of the Relationships Among Discrepancies

The following example illustrates the interactive relationships among the intra-ability discrepancies and the various ability/achievement discrepancies. Ann, a third-grade student, was referred by her teacher because of difficulties in reading. The goals of the assessment were to determine the extent of her reading difficulties and to identify the

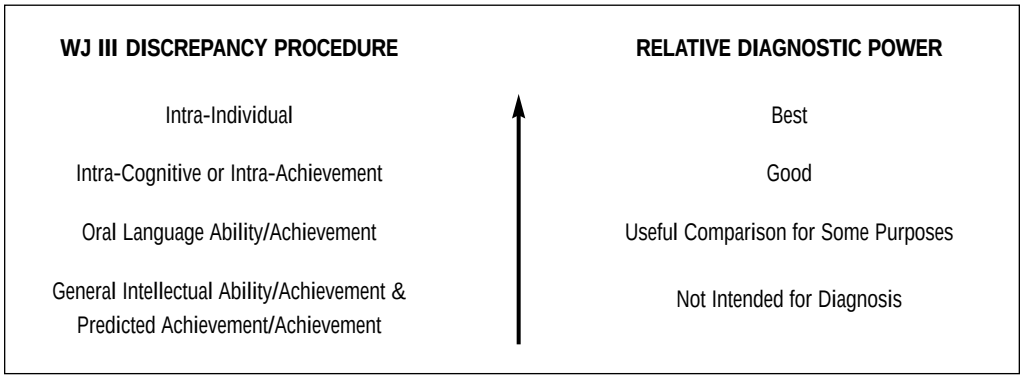

Figure 5.
Hierarchy of diagnostic power among the WJ III discrepancy procedures.

factors that had contributed to her slow reading development. When administered the WJ III COG, Ann had difficulty blending sounds orally (Test 4: Sound Blending) and identifying the whole word when hearing only part of a word (Test 8: Incomplete Words). She also scored in the low average range on a processing speed test, Visual Matching, where she had to rapidly locate the matching numbers in a row. Performances on all other cognitive tests fell within the average range. Ann did not have a significant predicted achievement/achievement discrepancy in reading. Because of her low scores on phonological and processing speed tasks, her predicted reading achievement was low and her actual basic reading skills were also low. In other words, Ann's reading ability was within the predicted range for others who possess similar cognitive abilities. This lack of discrepancy, however, does not rule out the existence of a specific reading disability. It merely shows that her present difficulties with reading are expected based on the cognitive abilities most related to early reading performance.

For the intra-individual discrepancy procedure, Ann demonstrated significant weaknesses in Auditory Processing and Processing Speed, as well as weaknesses in Basic Reading and Writing Skills. Within the WJ III ACH, Ann's performance on tests of basic reading and writing skills were significantly lower than her performance on tests involving higher-level oral language abilities and mathematics. This intra-achievement discrepancy was not surprising because problems with phonological processing have a greater impact on the development of literacy than on oral language and mathematics performance.

When her General Intellectual Ability, as well as her Oral Language Ability scores, were compared to her basic reading and writing skills, significant discrepancies existed. Her overall average abilities, as well as her average oral language abilities, predicted that Ann would have higher scores on reading tests. As noted from this case, the lack of a predicted achievement/achievement discrepancy suggested that Ann's reading difficulties could be explained. Her cognitive abilities related to reading were low. The intra-ability discrepancies, as well as the general intellectual ability/achievement and oral language ability/achievement discrepancies, helped to substantiate that Ann's failures with reading were not due to a generalized language impairment and were more accurately described as a "specific reading disability."

Most current theories of learning disabilities focus on domain-specific processes and, therefore, focus on the assessment of multiple abilities and how they vary (e.g., intra-ability discrepancies). Once an academic problem has been identified, the examiner attempts to determine the specific abilities or processing capacities that are affecting academic performance. As with its predecessor, the WJ-R, the WJ III has many different measures that can help an evaluator determine the factors related to poor performance. As noted by Woodcock (1997), "The WJ-R is based on a philosophy that the primary purpose of testing should be to find out more about the problem, not to determine an IQ" (p. 235). The varied discrepancy procedures available with the WJ III can help examiners accomplish this goal. The WJ III is based upon the belief that the diagnosis of learning disabilities should be multidimensional in nature, not based upon the findings from one discrepancy procedure or one definitive score.

Acknowledgement

The authors would like to thank Barbara Wendling for her assistance with the development and review of this assessment service bulletin. Her help was greatly appreciated.

References

American Educational Research Association (AERA), American Psychological Association (APA), & National Council on Measurement in Education (NCME). (1999). *Standards for educational and psychological testing*. Washington, DC: AERA.

Brackett, J., & McPherson, A. (1996). Learning disabilities diagnosis in postsecondary students: A comparison of discrepancy-based diagnostic models. In N. Gregg, C. Hoy, & A. F. Gay (Eds.), *Adults with learning disabilities: Theoretical and practical perspectives* (pp. 68–84). New York: Guilford Press.

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge University Press.

Elliott, C. D. (1990). *Differential Ability Scales*. San Antonio, TX: Psychological Corporation.

Flanagan, D. P., McGrew, K. S., & Ortiz, S. O. (2000). *The Wechsler intelligence scales and* Gf-Gc *theory: A contemporary approach to interpretation*. Boston: Allyn & Bacon.

Fletcher, J. M., Francis, D. J., Shaywitz, S. E., Lyon, G. R., Foorman, B. R., Stuebing, K. K., & Shaywitz, B. A. (1998). Intelligent testing and the discrepancy model for children with learning disabilities. *Learning Disabilities Research and Practice*, *13*, 186–203.

Jensen, A. R. (1998). *The* g *factor: The science of mental ability*.Westport, CT: Praeger.

McGrew, K. S., & Woodcock, R. W. (2001). Technical Manual. *Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

Rack, J. P., Snowling, M. J., & Olson, R. K. (1992). The nonword reading deficit in developmental dyslexia: A review. *Reading Research Quarterly*, *27*(1), 28–53.

Scarborough, H. S. (1991). Antecedents to reading disability: Preschool language development and literacy experiences of children from dyslexic families. In B. F. Pennington (Ed.), *Reading disabilities: Genetic and neurological influences* (pp. 31–45). Dordrecht, The Netherlands: Kluwer.

Schrank, F. A., & Woodcock, R. W. (2001). WJ III Compuscore and Profiles Program [Computer software]. *Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

Stanovich, K. E. (1991a). Conceptual and empirical problems with discrepancy definitions of reading disability. *Learning Disability Quarterly*, *14*, 269–280.

Stanovich, K. E. (1991b). Discrepancy definitions of reading disability: Has intelligence led us astray? *Reading Research Quarterly*, *26*, 7–29.

Thorndike, R. L., Hagen, E. P., & Sattler, J. S. (1986). *Stanford-Binet Intelligence Scale–Fourth Edition*. Itasca, IL: Riverside Publishing.

Wechsler, D. (1991). *Wechsler Intelligence Scale for Children–Third Edition*. San Antonio, TX: Psychological Corporation.

Woodcock, R. W., & Johnson, M. B. (1989). *Woodcock-Johnson Psycho-Educational Battery–Revised*. Itasca, IL: Riverside Publishing.

Woodcock, R. W. (1997). The *Woodcock-Johnson Tests of Cognitive Ability–Revised*. In D. P. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 230–246). New York: Guilford Press.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001a). *Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001b). *Woodcock-Johnson III Tests of Achievement*. Itasca, IL: Riverside Publishing.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001c). *Woodcock-Johnson III Tests of Cognitive Abilities*. Itasca, IL: Riverside Publishing.

Riverside Publishing
A HOUGHTON MIFFLIN COMPANY

425 Spring Lake Drive
Itasca, IL 60143-2079

1.800.323.9540
www.woodcock-johnson.com

9-95294