One

OVERVIEW OF THE WISC-V

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This book was written for assessment professionals who want to use the *Wechsler Intelligence Scale for Children-Fifth Edition* (WISC-V; Wechsler, 2014a) to help children and adolescents by understanding their cognitive strengths and weaknesses. Such a statement should be too obvious to mention, but it is not. Too often, in the public's eye, the purpose of intelligence tests is to assign labels to people, not to help them. Among some intellectuals, it is common to view intelligence tests as tools of oppression, designed to harm the least privileged and most vulnerable among us (Carroll, 1997).

Intelligence tests are—and have always been—powerful tools, and powerful tools can be used for good or for ill. People who are uneasy about the use of intelligence tests would likely be reassured if we clearly communicate to them what we actually do with intelligence tests: We use them as one tool among many to decide how best to help people. Professionals who use individually administered intelligence tests such as the WISC-V are not callous bureaucrats mechanically rendering judgments that decide the course of people's lives. Most of us sacrificed our twenties on the altar of graduate school. We did so gladly; becoming a member of the helping professions is a great honor. The thought of using intelligence tests to harm anyone, children in particular, is frightful.

Indeed, Alfred Binet and his colleagues developed modern intelligence tests because of their egalitarian ideals. They needed to find a fair and accurate method of identifying children and adolescents who needed additional help in school (Binet & Simon, 1916). This purpose continues to motivate most practitioners. Nevertheless, there is no denying that intelligence tests have been used to perpetrate injustice, particularly in their early history (Fancher, 1985). From the beginning, though, there were thoughtful and sophisticated theorists, practitioners, and ordinary people who fought against these injustices (Lohman, 1997). Even the person who coined the term *intelligence quotient* or IQ, William Stern (1933), worked tirelessly to ensure that intelligence tests were used for preserving human dignity instead of degrading individuals:

> Under all conditions, human beings are and remain the centers of their own psychological life and their own worth. In other words, they remain persons, even when they are studied and treated from an external perspective with respect to others' goals.... Working "on" a human being must always entail working "for" a human being. (Trans. Lamiell, 2003, pp. 54–55)

FROM PREDICTION TO PREVENTION

Although it is true that intelligence tests are potent long-term predictors of a wide array of important life outcomes such as academic achievement, high school graduation, and income (Deary, Whiteman, Starr, Whalley, & Fox, 2004; Gottfredson, 1997), they do not speak with the authority of the white-robed Fates. Hardship is not inevitable, and success is never assured. Many people possess personal virtues that more than offset whatever weaknesses an IQ test might reveal. Some have liabilities that negate any intellectual advantages they might otherwise have enjoyed. Nevertheless, the forecast is still useful. The weather report is not always correct, but it helps us plan for the day.

DON'T FORGET

Performance on intelligence tests is a potent predictor of important life outcomes such as academic achievement, high school graduation, and income.

It is not difficult to identify struggling children and adolescents after they have already fallen behind in school—no IQ test is needed for that. What is difficult is to prevent problems before they occur. Intelligence or cognitive ability tests can help professionals prioritize scarce resources so that students most likely to fall behind are better able to keep up and succeed. As Kaufman (1979, p. 14) famously quipped, "Intelligence test scores should result ultimately in killing the prediction." That is, the proper role of cognitive ability tests is to predict problems that never happen—because skilled professionals, dedicated teachers, and loving parents make plans and labor long hours to prevent them.

Unfortunately, not all problems, such as traumatic brain injuries, can be foreseen. Cognitive ability tests are essential tools for evaluating the nature and severity of these injuries. Sometimes they are used to monitor the rate of an individual's recovery.

Even perfectly predicted problems cannot always be completely prevented. Much can be done to improve the lives of individuals with intellectual disabilities and learning disabilities, even if we cannot yet eliminate their cognitive deficits entirely (Patterson, Rapsey, & Glue, 2013). Intelligence tests help us identify children with intellectual disabilities and learning disabilities very early so that interventions can have maximal effect.

FROM EXPLANATION TO ENDURING EMPATHY

Alongside *prediction*, the second major function of intelligence tests is *explanation*. That is, intelligence tests play a role in informing comprehensive case conceptualizations, and thus are particularly useful when preventative efforts are not working. Understanding why a student is performing poorly in school despite the best efforts of all involved is often the first step toward finding a better approach. More than that, understanding a student's learning difficulties often results in greater empathy for him or her.

Many students who are performing poorly in school often work hard to avoid academic activities they find to be difficult and unpleasant, sometimes by making things difficult and unpleasant for the adults who are trying to help them. When parents and teachers understand why the tasks are difficult, they are likely to be more patient. It is for this reason that one of the most important goals of writing effective psychoeducational reports is to help foster in the reader an enduring sense of empathy for the student.

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GENERAL TRENDS IN INTELLIGENCE TEST INTERPRETATION

Kamphaus and colleagues (1997, 2012) have outlined a number of long-term trends in how the use of cognitive ability tests has changed. Over the past 11 decades, there has been a shift away from the interpretation of a global IQ score toward the integrative understanding of how multiple factors of ability influence an individual's life. Multifactor tests are not exactly new, but recently developed tests are better grounded in strongly supported multifactor theories of cognitive abilities. Intuitively plausible, but haphazard and speculative interpretation systems are being replaced by systematic, empirically vetted, statistically sound approaches to interpretation. In this book, we strongly recommend one of these interpretive systems, the Cross-Battery Assessment approach (XBA; Flanagan, Ortiz, & Alfonso, 2013), which is closely aligned with the Cattell-Horn-Carroll Theory of Cognitive Abilities (CHC Theory; McGrew, 1997, 2005, 2009; Schneider & McGrew, 2012). (For a brief overview of CHC theory, including broad and narrow ability definitions, see Appendix A.)

DON'T FORGET

Appendix A includes a brief description of CHC theory, definitions of broad and narrow CHC abilities, and task examples of each narrow ability.

With each new edition, the WISC has become more amenable to the application of XBA and CHC Theory—changes we applaud! That said, progress is not always linear, and sometimes psychometric advances are dearly bought. There are subtests from previous editions of the WISC that sophisticated veteran users regret losing because they afforded opportunities to observe clinically rich samples of behavior. Thus, before talking about how the XBA approach can be applied to the WISC-V, we retrace our steps and perhaps recover some half-forgotten bits of wisdom from the creator of the original WISC, David Wechsler.

WHY THE HISTORY OF THE WECHSLER SCALES MATTERS

It is possible to administer the WISC-V competently without knowing much of anything about its history. Is it really necessary to become familiar with every twist and turn the evolution of the WISC has taken? Why not just study the most recent version?

The Wechsler scales are commercial products, and businesses respond to market demands. If practitioners are unaware of what made the original WISC great, they can clamor for changes that can inadvertently ruin the test. David Wechsler had a well-articulated vision for his instruments (Kaufman, 2009, pp. 29–54). Unless we come to know and appreciate what that vision was, the test's publishers will yield to pressures to give us more of what we think we want and less of what

David Wechsler thought we needed—to which, in our naiveté and ignorance, we will say, "Good riddance!"

For example, statistical training can sensitize us to the researcher's need for tests that cleanly measure unidimensional traits. From this perspective, the Wechsler scales are hopelessly messy. Why not make the Wechsler scales more like the relatively tidy tests from the Woodcock-Johnson cognitive batteries (e.g., *Woodcock-Johnson IV Tests of Cognitive Abilities* [WJ IV COG]; Schrank, McGrew, & Mather, 2014)? Because doing so would likely compromise what is special about the Wechsler scales, that they allow us to observe complex problem-solving processes as they unfold in real time. Unless we know more about what Wechsler was aiming for, we might not appreciate the fact that the "messiness" is a feature, not a bug. Wechsler did not create his tests to serve the needs of research. As he continually reminded Alan Kaufman, his former mentee, "First and foremost, the Wechsler scales are clinical tests—not psychometric tests but clinical tests" (Kaufman, 1994, p. xv).

With each revision of the WISC, *Wechsler Adult Intelligence Scale* (WAIS), and *Wechsler Preschool and Primary Scale of Intelligence* (WPPSI), old subtests are retired and new ones are added. The new developers of the Wechsler scales appear to be clearing away measures with clinical clutter to make room for tests that are more psychometrically sleek. There is a clear upside to this trend in that specific abilities are more easily isolated, but the downside is also very real. We are not making a plea for sloppy psychometrics, but for a diversity of options, including complex measures that allow for clinically rich observations. It is inevitable that Wechsler's tests should change with the times, but perhaps not too much, and not too soon. Likewise, it is probably better that the WJ tests stay true to Richard Woodcock's original vision; it is better for the field as a whole that we can choose among tests with complementary virtues.

Exposure to the history of the Wechsler scales not only broadens our knowledge of the tests, but often, in subtle ways, deepens our commitment to our field. When we learn about what mattered to David Wechsler as he constructed his tests, often we come to care about those things, too, to a degree that we did not before. Even learning about the weaknesses of the original tests is helpful. The missteps along the way as the tests evolved serve as cautionary tales, ultimately affirming what is most important to us as professionals.

DON'T FORGET

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Sometimes simply learning about the humanizing details of important figures' lives changes our outlook on their work. For example, Alan Kaufman's (2009) moving tribute to his mentor reveals Wechsler to have been a kind, thoughtful person with a sometimes imposingly strong sense of personal dignity. He was passionate about his work, if somewhat out of step with the times; as they worked to revise the WISC in the early 1970s, he bristled at Kaufman's suggestion that the Comprehension item "Why should women and children be saved first in a shipwreck?" might be perceived as sexist. Kaufman was taken aback at the inordinate intensity of Wechsler's instant response. Flushed with emotion, Wechsler objected, "Chivalry may be dying! Chivalry may be dead! But it will not die on the WISC!" Kaufman was afraid he had crossed a line he did not know was there.

In time, though, Wechsler relented. Chivalry did not die, but it *was* retired from the WISC-R. This anecdote says little about the theorist, but it says something about the complexity of the man. From where did this passion for a test item about protecting women and children in times of crisis come? Probably it is a manifestation of his upbringing, his experiences, and his personality as a whole. It is interesting to note, though, that his first book, *The Range of Human Capacities*, published in 1935, was dedicated to "the undying memory of Florence Felske," a commercial artist who in 1934, just three weeks after becoming David Wechsler's bride, was killed in a vehicular accident (Carson, 1999).

Alfred Binet and the "First" Intelligence Tests

The fastest way to disabuse oneself of the false notion that Binet invented the first intelligence test is to read the works of Binet himself. He and his colleagues presented several attempts by previous scholars to measure intelligence and to identify children with intellectual disabilities (Binet & Simon, 1916, pp. 15–36). Indeed, it is clear that Binet's methods include many borrowings from these earlier scholars, including exact copies of specific test items. Though intelligence tests have many historical anticipations, stretching back to antiquity (Deary, 2000, p. 34), the tests designed by Binet and colleagues were superior to earlier tests along many dimensions. For example:

1. The procedures were standardized.
2. Test items were vetted by thousands of clinicians and refined over multiple editions.
3. The test scores were given proper norms.
4. The test scores were validated by correlations with multiple criteria and life outcomes (e.g., health, wealth, degrees, and grades).

Before Binet, it was common for doctors and other specialists to interview individuals suspected of having low intelligence, asking them to perform various tasks and answer test-like questions. The diagnosis of the condition now termed *intellectual disability* was then made based mostly on the holistic judgment of the interviewer. Binet was never against holistic judgment, just holistic judgment that was uninformed by high-quality data. The value of high-quality norms was not self-evident at the time; Binet and Simon (1905, 1916) had to write several persuasive papers and book chapters about the dangers of nonstandard procedures and the benefits of carefully compiled national norms. Although the standardization procedures used to create the norms for the Binet-Simon would be inadequate by today's standards, they were reasonably good—and vastly superior to no norms at all.

From Mental Ages to Intelligence Quotients to Standard Scores

If Binet's tests were good, why did Wechsler need to improve upon them? There were certain psychometric problems with Binet's idea of closely aligning test scores with the age of the child. Almost anyone can immediately understand what it means when we say that an 8-year-old child obtained a test score equal to that of the average 6-year-old—the child is 2 years behind the average. What is not immediately apparent is how unusual this is. No matter—norms can be compiled. Maybe 5% of 8-year-olds perform at this level or lower. Unfortunately, being 2 years behind does not mean the same thing, nor is it equally common at every age. Separate tables would need to be compiled for each age group. At some point there are too many tables. Some simplification is necessary to make the meaning of scores consistent.

CAUTION

Being 2 years behind in ability does not mean the same thing at every age, nor is it equally common at every age.

William Stern (1914, p. 42) addressed this problem by inventing the *intelligence quotient* (IQ), which originally was a fractional quantity calculated like so:

$$IQ = \frac{Mental\ Age}{Chronological\ Age}$$

Later, this ratio was multiplied by 100 and rounded to the nearest integer. A child who is one year behind at age 4, two years behind at age 8, and three years at age 12 would at every age obtain an IQ of 75. A simple interpretation of this kind of IQ is that the mental capacities of a child with an IQ of 75 is advancing only three-quarters as fast as those of the average child. Stern knew that this was not strictly true, but believed that the IQ metric was a useful way of thinking about intellectual level.

The ratio of mental age to chronological age was more stable than Binet's measure of the difference of those values. However, the variability of intelligence quotients was not the same at all age levels (Wechsler, 1944, p. 25). For example, different percentages of children had IQs of 75 at different ages. Furthermore, the whole idea of *mental age* breaks down when intellectual growth tends to level off as adolescents approach adulthood. In late adulthood, intellectual decline is typical. An 80-year-old individual who scores as well as the average 40-year-old has performed better than the average 80-year-old. However, if the original IQ formula were mindlessly applied, this would result in a score of 50, which is absurd. Early test developers knew this and therefore applied other formulas for adults (e.g., comparing all adults to 14-year-olds), none of which were particularly satisfactory.

To address these problems, Wechsler reconceptualized *mental age* not as an age per se but as a score (i.e., the obtained score). From here, *chronological age* was also translated into a score (i.e., the expected mean score for a given age). Thus, the reconceptualized IQ:

$$IQ = 100 \times \frac{\textit{Obtained Score}}{\textit{Mean Score}}$$

Comparing obtained scores to mean scores like this is something of an improvement over the traditional IQ, especially for adults. Still, the problem with this method is that different score ratios would not always have the same meaning from test to test and from age to age. After a slight detour using a quirky type of deviation score, the Wechsler IQ scores eventually were expressed as *standard scores* instead of traditional intelligence quotients (Wechsler, 1958, pp. 241–242). Wechsler did not invent standard scores, but he adeptly adapted them for his tests and promoted their use.

Recall that Binet used the difference between mental age and chronological age. This tells us how far from the average a child performed. However, this distance does not have a consistent meaning. A *standard score*, in effect, puts this difference in the numerator and then gives it standardized meaning by dividing by the standard deviation, a measure of the typical distance a score is from the mean:

$$\frac{\textit{Deviation from the Mean}}{\textit{Typical Deviation from the Mean}}$$

More precisely,

$$\textit{Standard Score} = \frac{\textit{Obtained Score} - \textit{Mean Score}}{\textit{Standard Deviation}} \times 15 + 100$$

In this way, the Wechsler scales created intelligence scores that have a consistent meaning for all ages: They are standardized differences from the mean obtained by same-age peers. Wechsler Verbal IQ, Performance IQ, and Full Scale IQ were scaled to have means of 100 and standard deviations of 15 so that they would resemble traditional IQs. The Wechsler subtests are also standardized, but have means of 10 and standard deviations of 3.

DON'T FORGET

Standard intelligence scores are standardized differences from the mean obtained by same-age peers.

General Intelligence ≠ *g*

Binet invented a single-score test, but did not believe in general intelligence. Wechsler believed in general intelligence, but made multidimensional tests. What is going on here?

These scholars had complex views about intelligence and explicitly denied that their tests aligned perfectly with their respective definitions of intelligence (Wechsler, 1958, pp. 14–15). In fact, Binet denied that his tests measured intelligence at all! For him, intelligence was simply not amenable to measurement with the kinds of tests he and his colleagues developed (Binet & Simon, 1916):

> This scale properly speaking does not permit the measure of the intelligence, because intellectual qualities are not superposable, and therefore cannot be measured as linear surfaces are measured, but are on the contrary, a classification, a hierarchy among diverse intelligences; and for the necessities of practice this classification is equivalent to a measure. (p. 40)

Binet had a very particular purpose for his test, and the mental age concept accomplished its task reasonably well. When the goal is to identify children with intellectual disabilities quickly, a summary score was all that was needed.

In contrast, Wechsler wanted his instrument to be capable of revealing highly nuanced information about how people use their intellect (indeed, their whole personalities) to solve problems (Kaufman, 1994, pp. ix–xv). Wechsler made his scales to measure what he called *general intelligence*. Although many scholars use this term interchangeably with the first factor that emerges in a factor analysis of cognitive tests (i.e., Spearman's *g*), Wechsler did not. Although he admired Spearman's (1904, 1927) theories about the general factor of intelligence, Wechsler (1944) did not equate general intelligence with Spearman's *g*:

> We may say that "g" is a psychomathematical quantity which measures the mind's capacity to do intellectual work. Everybody will agree that the capacity to do intellectual work is a necessary and important sign of general intelligence. The question is whether it is the only important or paramount factor. In this writer's opinion it is not. (p. 8)

Truth be told, Spearman did not equate *g* with intelligence either (Spearman, 1927, pp. 75–76), though on this topic he was sometimes coy with his readers.

What did Wechsler mean when he used the term *general intelligence*? Certainly it included intellectual ability, but he asserted that it "must be regarded as a manifestation of the personality as a whole" (Wechsler, 1950, p. 83). Although general intelligence consists of many parts, it is the configuration of those parts that determines an individual's overall capacity "to act purposefully, to think rationally, and to deal effectively with [one's] environment" (Wechsler, 1958, p. 7). What were those parts? Wechsler did not claim to know precisely.

> We do not know what the ultimate nature of the "stuff" which constitutes intelligence but … we know it by the "things" it enables us to do—such as making appropriate associations between events, drawing correct inferences from propositions, understanding the meaning of words, solving mathematical problems or building bridges. (pp. 7–8)

To Wechsler, intelligence encompassed numerous primary mental abilities (as tentatively revealed by factor analysis) and also many non-intellective traits and abilities, including drive, persistence, self-control, and social adaptation (Wechsler, 1950, 1958, p. 13). These more subtle aspects of intelligence tend to be difficult to detect with factor analysis, but are nevertheless observable during testing and in other settings. It was one of Wechsler's great regrets that he never succeeded in developing good measures of these non-intellective factors of intelligence, despite several attempts and considerable effort (Tulsky, Saklofske, & Zhu, 2003).

Wechsler's tests yield many different kinds of scores, all of which could be considered carefully, but ultimately he wanted the test to be an index of the individual's global capacity:

> [The diverse tasks in intelligence tests] are only means to an end. Their object is not to test a person's memory, judgment or reasoning ability, but to measure something which it is hoped will emerge from the sum total of the subject's performance, namely, his general intelligence. (Wechsler, 1958, p. 9)

We begin with a series of aptitude measures, but somehow end up with an IQ. How is this possible? The suggested answer is that in the process we are using measures of ability primarily as a tool; that is, not as an end in itself but as a means for discovering something more fundamental. Then, when an examiner employs an arithmetic or a vocabulary test as part of an intelligence scale, the object of the examiner is not to discover the examinee's aptitude for arithmetic or extent of his word knowledge, although these are inevitably involved, but his capacity to function in overall areas that are assumed to require intelligence:

> While intellective abilities can be shown to contain several independent factors, intelligence cannot be so broken up. Hence, no amount of refinement of tests or addition of factors will account for the total variance of an intelligence test battery, because the variance in intelligence test performance is due not only to the direct contributions of the factors themselves but also to their collective behavior or integration. (Wechsler, 1958, p. 23)

Wechsler's Subtests

To say that David Wechsler did not invent new tests but merely adapted them is to fail to discern his genius. There were hundreds of tests available when he was developing his first battery, the Wechsler-Bellevue. It was not dumb luck that the Wechsler scales displaced the Stanford-Binet to become the dominant clinical measure of intelligence and retain that position for decades.

Wechsler believed that his first intelligence test was successful because it relied so heavily on the experience of others (Wechsler, 1944, p. 76). He found that it was nearly impossible to know whether a new test format or even a particular test item was going to be a good indicator of intelligence until it had been tried out clinically and evaluated statistically. As an example, he tells how when trying out items for the Information subtest, no one could predict which of two very similar items would be better: "How many pints make a quart?" or "How many feet make a yard?" The former item turned out to distinguish reliably among people at the low end of intelligence. The latter was practically worthless. "Certainly no one would have predicted this result in advance. Now that we have discovered it, we must frankly admit we can offer no good reason for the fact" (p. 75). This is not to say that good tests and good items are discovered purely by trial and error. Each test was carefully selected and each item was thoroughly scrutinized. Nevertheless, there are limits to how well one can reason one's way toward constructing a good test. In the end, each subtest had to correlate highly with established tests of intelligence and, more important, had to correlate with subjective ratings of intelligence by informed raters such as teachers, army officers, and business executives. Thus, it was something akin to natural selection—letting the data decide which items should live or die—that let the Wechsler scales climb Mount Improbable to become the most successful intelligence tests in history. If Wechsler had invented all of his tests from scratch, there would not have been enough time and resources to develop them properly, and they would most likely have failed to catch on, like so many other intelligence tests from his era that are now mostly forgotten.

Yerkes Point Scales

Binet's tests are delicious Sloppy Joes with diverse ingredients chopped up and thrown together. Wechsler's tests are well-structured sandwiches; the flavors blend nicely, but each layer is distinct.

In Binet-style tests, the diverse items are sequenced by difficulty, and item formats change frequently. Thus, if an individual answers a question incorrectly, it is difficult to know whether it was the item or the type of task that was too challenging for that individual. In contrast, Wechsler subtests generally hold the item format constant, ordering items from easy to difficult. This means that the diversity of tasks is reduced, but it allows clinicians to see which types of tasks are easy and which tasks are difficult for an individual, allowing clinicians to produce a more differentiated description of his or her intelligence.

This approach to constructing homogeneous subtests, termed *point scales*, was developed by Yerkes (1915) and then used to create new intelligence tests for the U.S. Army during World War I. One of these tests, the Army Alpha, was a battery of verbal tests, whereas the Army Beta was a battery of nonverbal performance tests. If this division between verbal and performance tests sounds familiar, you might be interested to know that on Yerkes's team of young psychologists was one David Wechsler.

Yerkes's use of diverse point scales with homogeneous items is now the dominant method of measuring intelligence. In a thoughtful essay, Lohman (1997) acknowledges that Yerkes's approach is a major advance, but one that seduces us into believing that because we control the format of the test we know what it measures. Wechsler (1958) was not fooled by this illusion. For him, the item content was not particularly important. Rather, what mattered was whether the individual responded to the item in a manner that was intelligent.

DON'T FORGET

For David Wechsler item content was not particularly important; what mattered was whether the individual responded to the item in a manner that was intelligent.

Previous Editions of the WISC

It is important to know the changes in previous editions of the WISC because it is common to see old scores from previous evaluations. Furthermore, research on previous editions of the WISC does not necessarily generalize to the newer editions if the scores have radically changed in their content (e.g., the WISC-III Perceptual Organization Index [POI] and the WISC-IV Perceptual Reasoning Index [PRI] only have Block Design in common). In Table 1.1, it is easy to see that the composition of the WISC was quite stable in the first three editions. The WISC-III retained the Verbal and Performance IQ, but introduced the factor index scores that were more psychometrically pure. The VIQ and PIQ were dropped on the WISC-IV, along with three of David Wechsler's subtests (Picture Arrangement, Object Assembly, and Mazes). Five new subtests were added to help refine and update the WISC-IV factor index scores.

DESCRIPTION OF THE WISC-V

Several issues prompted the revision of the WISC-IV. These issues are detailed clearly in the *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b). Table 1.2 provides general information about the WISC-V, and Rapid Reference 1.1 lists the most salient changes from the WISC-IV to the WISC-V.

Table 1.1 Subtest Structure of Previous Editions of the WISC

	WISC/R/III			WISC-III				WISC-IV				
	FS	VIQ	PIQ	VC	PO	FD	PS	FS	VC	PR	WM	PS
Information	•	•		•				•	•			
Similarities	•	•		•				•	•			
Vocabulary	•	•		•				•	•			
Comprehension	•	•		•					o			
Word Reasoning									o			
Arithmetic	•	•				•					o	
Digit Span		o				•		•			•	
Letter-Number Sequencing								•			•	
Matrix Reasoning								•		•		
Picture Concepts								•		•		
Picture Completion	•		•		•					o		
Block Design	•		•		•			•		•		
Picture Arrangement	•		•		•							
Object Assembly	•		•		•							
Mazes			o		o							
Coding	•		•				•	•				•
Symbol Search							•	•				•
Cancellation												o

Note: o = Supplementary or conceptually related test. FS = Full Scale IQ; VIQ = Verbal IQ; PIQ = Performance IQ; VC = Verbal Comprehension; PO = Perceptual Organization; FD = Freedom From Distractibility; PS = Processing Speed; PR = Perceptual Reasoning; WM = Working Memory.

Table 1.2 The WISC-V At A Glance

GENERAL INFORMATION	
Author:	David Wechsler (1896–1981)
Publication Date(s):	1949, 1974, 1991, 2003, 2014
Age Range:	6:0 to 16:11years
Administration Time:	48 to 65 minutes

GENERAL INFORMATION

Qualification of Examiners:	Graduate- or professional-level training in psychological assessment
Publisher:	Pearson Ordering Department P.O. Box 599700 San Antonio, TX 78259 800-629-7271 http://www.pearsonclinical.com

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COMPOSITE MEASURE INFORMATION

Global Ability:	Full Scale IQ (FSIQ) General Ability Index (GAI) Nonverbal Index (NVI)
Lower-Order Composites:	Verbal Comprehension Index (VCI) Visual Spatial Index (VSI) Fluid Reasoning Index (FRI) Working Memory Index (WMI) Processing Speed Index (PSI) Cognitive Proficiency Index (CPI) Quantitative Reasoning Index (QRI)

(continued)

(continued)

COMPOSITE MEASURE INFORMATION	
	Auditory Working Memory Index (AWMI)
	Naming Speed Index (NSI)
	Symbol Translation Index (STI)
	Storage and Retrieval Index (SRI)
Number of Subtests	21
SCORE INFORMATION	
Available Scores	Standard
	Scaled
	Percentile
	Age Equivalent
	Contrast
Range of Standard Scores for Global Ability Composites 40–160 (ages 6:0 to 16:11 years)	

NORMING INFORMATION	
Normative Sample Size	2,200
Sample Collection Dates	April 2013–March 2014
Average Number per Age Interval	200
Age Blocks in Norm Table	4 months (ages 6:0 to 16:11 years)
Demographic Variables:	Age
	Gender (male, female)
	Geographic region (four regions)
	Race/ethnicity (White; African American; Hispanic; Asian; other)
	Socioeconomic status (parental education)
Types of Validity Evidence in Test Manual	Test content
	Response processes
	Internal structure
	Relationships with other variables
	Consequences of testing

Rapid Reference 1.1

Changes From the WISC-IV to the WISC-V

- Addition of eight new subtests: Visual Puzzles, Figure Weights, Picture Span, Naming Speed Literacy, Naming Speed Quantity, Immediate Symbol Translation, Delayed Symbol Translation, and Recognition Symbol Translation

- Addition of Digit Span Sequencing to the Digit Span Subtest
- Word Reasoning and Picture Completion Subtests from the WISC-IV were not included in the WISC-V
- Q-interactive and Q-global online administration, scoring, and reporting options available
- Incorporated new research on intelligence, neurodevelopment, cognitive neuroscience, cognitive development, and processes important to learning
- Modified and new items added to subtests
- Scoring criteria for items revised for subtests
- Items added to improve floors and ceilings of subtests
- Provides standard scores for certain subtests (e.g., Naming Speed Literacy)
- No longer refers to subtests using the terms *supplemental* and *core*
- Substitution only permitted for FSIQ
- Provides global composite score options (NVI and GAI) in addition to the FSIQ
- PRI replaced by the VSI and the FRI
- Updated theoretical foundations
- Increased developmental appropriateness (instructions modified; teaching, sample, and/or practice items for each subtest)
- Shorter testing time to derive the FSIQ
- Replaced all WISC-IV items that were originally published on the WISC, WISC-R, or WISC-III
- More explicit and simple administration and scoring instructions to increase user-friendliness
- Substantially reduced discontinue rules
- Expanded significance level options for critical values: .01, .05, .10, .15
- Measures of processing speed modified
- Artwork updated to be more current, attractive, and engaging to children
- Estimate of overall ability (i.e., either the FSIQ or the mean primary index score [MIS]) can be used to evaluate strengths and weaknesses across primary index scores
- Addition of the NVI to provide more information about children with English as a second language and children with expressive language problems
- Expanded number of process scores
- Increased the number of special group studies during standardization to enhance clinical utility

Source: Information in this table was derived, in part, from the *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b).

Table 1.3. New Subtests on the WISC-V

Index	Subtest
Visual Spatial	Visual Puzzles
Fluid Reasoning	Figure Weights
Working Memory	Picture Span
Naming Speed	Naming Speed Literacy
	Naming Speed Quantity
Symbol Translation	Immediate Symbol Translation
	Delayed Symbol Translation
	Recognition Symbol Translation

Note: The Digit Span subtest now includes Digit Span Sequencing.

Although users of the WISC-V will recognize many traditional WISC subtests on this latest edition of the Wechsler scales, users will also find eight new ones (see Table 1.3). The WISC-V has 21 subtests (see Table 1.4 for subtest descriptions) and 14 composites, including the FSIQ (see Figure 1.1 for composition of FSIQ) and five Primary Index Scales (see Figure 1.2), as well as five Ancillary Index Scales and three Complementary Index Scales (see Figure 1.3).

Table 1.4 Descriptions of WISC-V Subtests

Subtest	Description
1. Block Design (BD)*	The examinee is required to replicate a set of modeled and/or printed two-dimensional geometric patterns using red-and-white blocks within a specified time limit.
2. Similarities (SI)*	The examinee is required to describe how two words that represent common objects or concepts are similar.
3. Matrix Reasoning (MR)*	The examinee is required to complete the missing portion of a picture matrix or series by selecting one of five response options.
4. Digit Span (DS)*	On Digit Span Forward, the examinee is required to repeat numbers verbatim as stated by the examiner. On Digit Span Backward, the examinee is required to repeat numbers in the reverse order as stated by the examiner. On Digit Span Sequencing, the examinee is required to repeat numbers in ascending order as stated by the examiner.

Subtest	Description
5. Coding (CD)*	The examinee is required to copy symbols that are paired with either geometric shapes or numbers using a key within a specified time limit.
6. Vocabulary (VC)*	The examinee is required to name pictures or provide definitions for words.
7. Figure Weights (FW)*	The examinee is required to select a response option that will keep a scale with missing weights balanced within a specified time limit.
8. Visual Puzzles (VP)	The examinee is required to select three response options that combine to recreate a completed puzzle within a specified time limit.
9. Picture Span (PS)	The examinee is shown one or more pictures on a stimulus page and then required to select those pictures (in sequential order if possible) from a response page.
10. Symbol Search (SS)	The examinee is required to scan a search group and indicate the presence or absence of a target symbol(s) within a specified time limit.
11. Information (IN)	The examinee is required to answer questions that address a wide range of general-knowledge topics.
12. Picture Concepts (PC)	The examinee is required to choose one picture per row, from two or three rows of pictures presented, to form a group with a common characteristic.
13. Letter-Number Sequencing (LN)	The examinee is read a number and letter sequence and is required to recall numbers in ascending order and letters in alphabetical order.
14. Cancellation (CA)	The examinee is required to scan both a random and a nonrandom arrangement of pictures and mark target pictures within a specified time limit.
15. *Naming Speed Literacy (NSL)*	The examinee is shown arrays of objects of various colors, then various colors and sizes, or of letters and numbers and is required to name them as quickly as possible.
16. *Naming Speed Quantity (NSQ)*	The examinee is shown pictures of boxes and is required to name the number of squares within each box.
17. *Immediate Symbol Translation (IST)*	The examinee is taught visual-verbal pairs and then is required to translate strings of symbols into sentences or phrases.
18. Comprehension (CO)	The examinee is required to answer a series of questions based on his or her understanding of general principles and social situations.

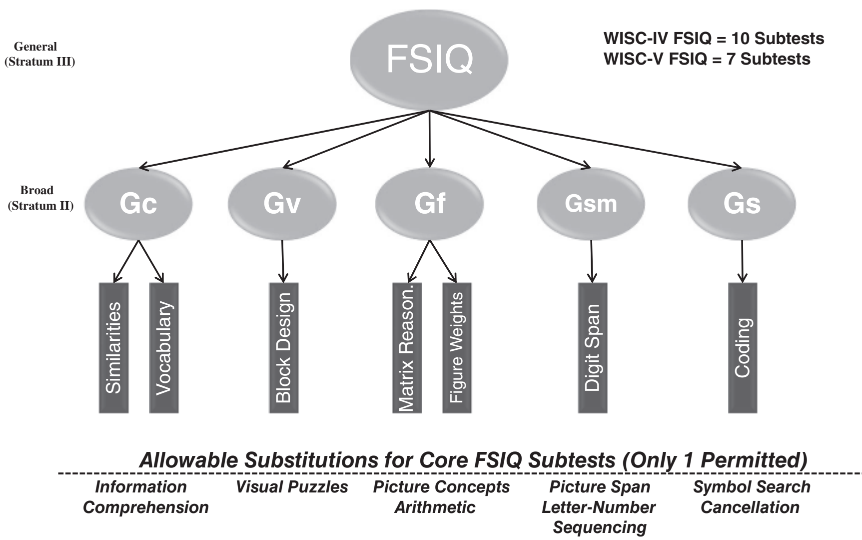
(continued)

(continued)

Subtest	Description
19. Arithmetic (AR)	The examinee is required to mentally solve a variety of orally or visually presented arithmetic problems within a specified time limit.
20. *Delayed Symbol Translation (DST)*	The examinee is required to translate strings of symbols learned from the Immediate Symbol Translation subset into sentences or phrases.
21. *Recognition Symbol Translation (RST)*	The examinee is shown a symbol learned from the Immediate Symbol Translation subtest and is required to select the correct translation from a list of verbally presented response options.

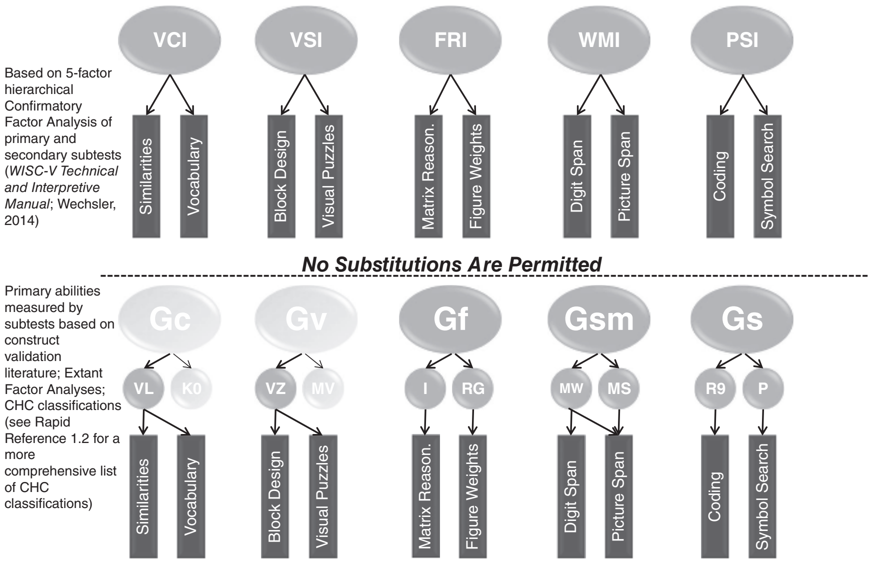
Note: FSIQ subtests are denoted with an asterisk, primary subtests are printed in bold, secondary subtests appear in regular font, and complementary subtests appear in italics.

Source: Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V).



Note: Gc = Crystallized Intelligence; Gv = Visual Processing; Gf = Fluid Reasoning; Gsm = Short-Term Memory; Gs = Processing Speed.

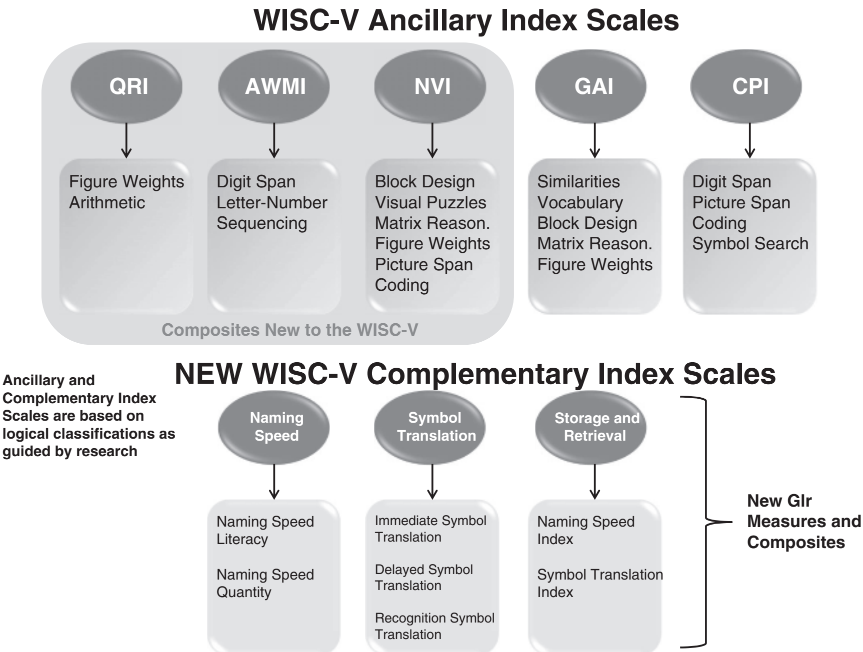
Figure 1.1 Composition of the WISC-V Full Scale IQ



Note: VL = Lexical Knowledge; K0 = General (Verbal) Information; VZ = Visualization; MV = Visual Memory; I = Induction; RG = General Sequential Reasoning; MW = Working Memory Capacity; MS = Memory Span; R9 = Rate of Test-taking; P = Perceptual Speed.

Figure 1.2 WISC-V Primary Index Scales

Rapid Reference 1.2 includes the CHC broad ability classifications of the WISC-V according to multiple data sources. The first column shows the broad CHC classifications provided by the publishing company. All classifications based on other data sources listed in this rapid reference are highly consistent with the publisher's classifications. Differences across data sources appear to be related to two main questions: (1) Are Gf and Gv separate factors on the WISC-V?, and (2) What does Arithmetic measure? All the data sources listed in Rapid Reference 1.2 are based on within-battery factor analyses (excluding the complementary subtests), which may obscure information about the breadth of cognitive abilities measured by the WISC-V battery as well as its individual subtests (Woodcock, 1990). The classifications in the last column are based on a review of cross-battery factor analyses that included Wechsler subtests. Theory-driven, cross-battery factor analyses are preferable because they assist in clarifying the range of abilities measured by batteries and individual subtests (Reynolds, Keith, Flanagan, & Alfonso, 2013; Woodcock). Therefore, the broad ability classifications reported in the last column of this rapid reference are the ones that are used throughout this book and in the Cross-Battery Assessment Software System (X-BASS v2.0; Ortiz, Flanagan, & Alfonso, 2017).



Note: QRI = Quantitative Reasoning Index; AWMI = Auditory Working Memory Index; NVI = Nonverbal Index; GAI = General Ability Index; CPI = Cognitive Processing Index; Glr = Long-Term Storage and Retrieval.

Figure 1.3 WISC-V Ancillary and Complementary Index Scales

Although broad CHC classifications provide information related to the cognitive abilities measured by the WISC-V subtests, they do not capture all the processes any given individual uses when answering questions and solving problems. Therefore, in addition to broad CHC classifications of subtests, Rapid Reference 1.3 provides narrow CHC classifications as well as information about other abilities and processes that may be involved in completing each subtest. Additionally, background and environmental factors that may facilitate or inhibit performance on a subtest are included in this rapid reference. The type of information included in this rapid reference is often used to generate hypotheses regarding why certain subtests differ significantly from one another. For example, it may not be expected that the Information and Comprehension subtests would differ significantly from one another because both measure Crystallized Intelligence (Gc) at the broad ability level and General (Verbal) Knowledge (K0) at the narrow ability level. Also, these subtests are highly correlated. Therefore, when they do

Rapid Reference 1.2

Broad CHC Classifications of WISC-V Subtests According to Various Data Sources

	Data Source					
Subtest	**Wechsler (2014b)**	**Schneider (this chapter)**	**Sattler, Dumont, & Coalson (2016)**	**Canivez, Watkins, & Dombrowski (2016)**	**Reynolds & Keith (2016)**	**Ortiz, Flanagan, & Alfonso (2017)**
Similarities	Gc	Gc	Gc	Gc	Gc	Gc
Vocabulary	Gc	Gc	Gc	Gc	Gc	Gc
Information	Gc	Gc	Gc	Gc	Gc	Gc
Comprehension	Gc	Gc	Gc	Gc	Gc	Gc
Block Design	Gv	Gv	Gv, Gf	Gv, Gf	Gv	Gv
Visual Puzzle	Gv	Gv	Gv, Gf	Gv, Gf	Gv	Gv
Matrix Reasoning	Gf	Gf, Gv	Gv, Gf	Gv, Gf	Gf	Gf
Picture Concepts	Gf	Gc/Gv	Gc, Gv, Gf	Gv, Gf	Gf	Gf
Figure Weights	Gf	Gf	Gv, Gf	Gv, Gf	Gf	Gf
Arithmetic	Gf, Gsm, Gc	Gsm, Gf, Gc	Gsm, Gc	Gsm	Gsm (g)*	Gsm, Gq
Digit Span	Gsm	Gsm	Gsm	Gsm	Gsm	Gsm
Picture Span	Gsm	Gsm	Gsm	Gsm	Gsm	Gsm
Letter-Number Sequencing	Gsm	Gsm	Gsm	Gsm	Gsm	Gsm
Coding	Gs	Gs	Gs	Gs	Gs	Gs
Symbol Search	Gs	Gs	Gs	Gs	Gs	Gs
Cancellation	Gs	Gs	Gs	Gs	Gs	Gs

*Arithmetic was primarily a direct indicator of *g*.

Note: Gf = Fluid Reasoning; Gq = Quantitative Knowledge; Gc = Crystallized Intelligence; Gsm = Short-Term Memory; Gv = Visual Processing; Gs = Processing Speed.

differ unexpectedly, the information in the second and third columns of Rapid Reference 1.3 may assist the practitioner in understanding the difference. For instance, when Information is significantly higher than Comprehension, it may suggest that the individual's fund of knowledge is better developed than his or her social judgment and practical reasoning (Sattler, Dumont, & Coalson, 2016). In addition to the information in Rapid Reference 1.3, Chapters 4 and 6 provide information to assist in understanding unexpected variation in performance.

Rapid Reference 1.3

Suggested Abilities and Processes Measured by WISC-V Subtests and Possible Influences on Subtest Performance

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Similarities	Crystallized Intelligence (Gc) *Lexical Knowledge (VL)* Fluid Reasoning (Gf) *Induction (I)*	Language development Abstract reasoning Associative and categorical thinking Auditory comprehension Cognitive flexibility Concept formation Long-term memory Verbal comprehension Verbal expression Ability to separate essential from nonessential details Receptive/expressive language	Exposure to early education and quality of instruction Cultural opportunities Stimulating language environment in the early years Exposure to literacy Auditory acuity
Vocabulary	Crystallized Knowledge (Gc) *Lexical Knowledge (VL)*	Language development Fund of knowledge Learning ability Long-term memory Verbal comprehension Verbal concept formation Verbal fluency Expressive/receptive language	Exposure to early education and quality of instruction Cultural opportunities Stimulating language environment in the early years Exposure to literacy Intellectual curiosity Auditory acuity

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Information	Crystallized Intelligence (Gc) *General (Verbal) Information (K0)*	Long-term memory Verbal comprehension Receptive/expressive language	Exposure to early education and quality of instruction Cultural opportunities Stimulating language environment in the early years Alertness to environment Intellectual curiosity Auditory acuity
Comprehension	Crystallized Intelligence (Gc) *General Information (K0)*	Language development Long-term memory Social judgment Common sense Logical reasoning Knowledge of societal and cultural mores Moral and ethical judgment Verbal comprehension Expression/receptive language Verbal reasoning and conceptualization	Exposure to early education and quality of instruction Cultural opportunities Stimulating language environment in the early years Development of conscience or moral sense Alertness to environment Auditory acuity
Block Design	Visual Processing (Gv) *Visualization (Vz)*	Ability to learn Nonverbal concept formation Visual-perceptual reasoning Visual-perceptual discrimination Visual-perceptual organization Simultaneous processing Visual-motor coordination Analysis and synthesis Speed of mental and visual-motor processing Planning ability Attention and concentration	Ability to work under time pressure Visual acuity Flexibility and trial and error learning Motivation, persistence, and effort Experience with puzzles and construction toys

(continued)

(continued)

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Visual Puzzles	Visual Processing (Gv) *Visualization (Vz)*	Integration and synthesis of part-whole relationships Visual acuity Visual working memory Visual-perceptual discrimination Attention and concentration	Motivation, persistence, and effort Exposure to puzzles and construction toys Ability to work under time pressure Visual acuity
Matrix Reasoning	Fluid Reasoning (Gf) *Induction (I)*	Visual processing Classification ability Knowledge of part-whole relationships Simultaneous processing Spatial ability Visual-perceptual reasoning, discrimination, and organization Attention and concentration	Visual acuity Motivation, persistence, and effort
Figure Weights	Fluid Reasoning (Gf) *General Sequential Reasoning (RG)* *Quantitative Reasoning (RQ)*	Induction Working memory Visual processing Attention and concentration	Educational history and exposure to early number concepts and skills Visual acuity Motivation, persistence, and effort Ability to work under time pressure
Picture Concepts	Fluid Reasoning (Gf) *Induction (I)*	General information Lexical knowledge Conceptual thinking Visual-perceptual discrimination and reasoning Ability to separate essential from nonessential details	Cultural opportunities Stimulating language environment in the early years Quality of early education Motivation, persistence, and effort Visual acuity

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Arithmetic	Working Memory (Gsm) *Working Memory Capacity (MW)* Quantitative Knowledge (Gq) *Math Achievement (A3)*	Applied computational ability Long-term memory Numerical reasoning ability Attention and concentration	Early exposure to numbers Quality of early instruction Auditory acuity Capacity to self-monitor
Digit Span	Working Memory (Gsm) *Memory Span (MS)* *Working Memory Capacity (MW)*	Auditory discrimination Auditory sequential processing Numerical ability Auditory rehearsal Mental manipulation Temporary storage Rote learning Attention and concentration	Auditory acuity Capacity to self-monitor Use of encoding and rehearsal strategies
Picture Span	Working Memory (Gsm) *Memory Span (MS)*	Visual working memory Visual sequential processing Rote learning Attention and concentration	Visual acuity Capacity to self-monitor Use of encoding and rehearsal strategies
Letter-Number Sequencing	Working Memory (Gsm) *Working Memory Capacity (MW)*	Memory span Auditory discrimination Rote learning Auditory sequential processing Mental manipulation Numerical ability Attention and concentration	Auditory acuity Capacity to self-monitor Use of encoding and rehearsal strategies

(continued)

(continued)

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Coding	Processing Speed (Gs) *Rate of Test Taking (R9)*	Attention and concentration Associative memory Cognitive flexibility Fine motor coordination or dexterity Procedural and incidental learning ability Psychomotor speed Short-term visual memory Visual-motor coordination Scanning ability Visual-perceptual discrimination	Rate of motor activity Motivation, persistence, and effort Visual acuity Ability to work under time pressure Experience with paper and pencil tasks
Symbol Search	Processing Speed (Gs) *Perceptual Speed (P)*	Decision speed Inhibitory control Visual-perceptual discrimination Psychomotor speed and coordination Short-term visual memory Visual-motor and fine motor coordination Attention and concentration	Rate of motor activity Motivation, persistence, and effort Visual acuity Ability to work under time pressure Experience with paper and pencil tasks
Cancellation	Processing Speed (Gs) *Perceptual Speed (P)*	Decision speed Rate of test taking Visual-motor coordination or dexterity Visual processing Visual-perceptual recognition and discrimination Visual scanning ability Ability to maintain set Attention and concentration	Rate of motor activity Motivation, persistence, and effort Visual acuity Ability to work under time pressure Experience with paper and pencil tasks
Naming Speed Literacy	Long-term Storage and Retrieval (Glr) *Naming Facility (NA)*	Processing speed Rate of test taking Scanning ability Automaticity in visual-verbal associations Attention and concentration	Early and sustained exposure to letters and numbers Visual acuity Motivation, persistence, and effort Ability to work under time pressure

WISC-V Subtest	CHC Broad and Narrow Abilities Measured	Other Possible Abilities and Processes Measured	Possible Influences on Subtest Performance[a]
Naming Speed Quantity	Long-term Storage and Retrieval (Glr) *Naming Facility (NA)* Processing Speed (Gs) *Number Facility (N)*	Rate of test taking Visual-perceptual processing and discrimination Scanning ability Number sense Attention and concentration	Early and sustained exposure to numbers and quantities Quality of early instruction Visual acuity Motivation, persistence, and effort Ability to work under time pressure
Immediate Symbol Translation	Long-term Storage and Retrieval (Glr) *Associative Memory (MA)*	Visual memory Working memory capacity Visual-perceptual discrimination Learning ability Scanning ability Attention and concentration	Use of encoding strategies Motivation, persistence, and effort Visual acuity
Delayed Symbol Translation	Long-term Storage and Retrieval (Glr) *Associative Memory (MA)*	Visual memory Delayed visual recall Visual-perceptual discrimination Scanning ability Attention and concentration	Use of encoding strategies Motivation, persistence, and effort Visual acuity
Recognition Symbol Translation	Long-term Storage and Retrieval (Glr) *Associative Memory (MA)*	Visual memory Delayed visual recall Visual-perceptual discrimination Scanning ability Attention and concentration	Use of encoding strategies Motivation, persistence, and effort Visual acuity

Note: CHC narrow abilities are italicized. Information in this table was compiled from the following sources: *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b); *Essentials of WISC-IV Assessment* (Flanagan & Kaufman, 2009); and the *Cross-Battery Assessment Software Program* (X-BASS; Ortiz et al., 2017).

[a]Information in this column adapted from Sattler et al. (2016).

No reader of this book should be under the illusion that administering the WISC-V without reading the manuals first is an option. However, it is easy to lose oneself in the psychometric details of the manuals' extensive discussions concerning the structure, reliability, and validity of the WISC-V. For this reason, we summarize key points found in the manuals, evaluating claims as we go.

The WISC-V is a carefully normed instrument suitable for children and adolescents in the United States ages 6:0–16:11 years. According to the *WISC-V Administration and Scoring Manual* (Wechsler, 2014c), the WISC-V is designed to identify intellectual giftedness, intellectual disability, and specific cognitive strengths and weaknesses for identification or diagnosis of specific learning disabilities in educational, clinical, and research settings. It is often used for the purpose of treatment planning and educational placement decisions. Also, the WISC-V can play a role in neuropsychological evaluations to help evaluate various aspects of neuropsychological functioning.

As seen in Table 1.5, the 21 WISC-V subtests (some of which have sub-subtests, e.g., Digit Span) can be combined in a variety of ways to estimate diverse aspects of cognitive functioning including verbal comprehension, visual spatial reasoning, fluid reasoning, working memory capacity, processing speed, general ability, and long-term storage and retrieval. The internal consistency reliability coefficients (found in Table 1.5) and the short-term stability coefficients of these scores are generally high, comparable to those of previous editions.

g-loadings of WISC-V Subtests

g-loadings are an important indicator of the degree to which a subtest measures general intelligence. Additionally, *g*-loadings aid in determining the extent to which a single subtest score can be expected to vary from other scores within the profile. The WISC-V subtest *g*-loadings were derived from a Principal Axis Factor Analysis reported in Sattler et al. (2016). WISC-V subtests that were found to be high, moderate, and low measures of *g*, based on this analysis, are reported in Table 1.6. These *g*-loadings may be useful in combination with other data (e.g., information reported in Rapid Reference 1.3) when generating hypotheses about fluctuations in a child's or adolescent's scaled score profile. For example, it would not be unusual to find that subtest scores with low *g*-loadings differ sometimes substantially from subtest scores with high *g*-loadings. More than 40% of individuals with GAIs of 120 or higher have CPIs that are a full standard deviation below their GAI. In other words, a standard deviation difference between a composite comprised of subtests with moderate to high *g*-loadings (i.e., GAI) and a composite comprised of mostly moderate to low *g*-loadings (i.e., CPI) is

Table 1.5 Structure of the WISC-V Composite Scores and Corresponding Internal Consistency Coefficients.

	Average Internal Consistency	Verbal Comprehension	Verbal Expanded Crystallized	Visual Spatial	Fluid Reasoning	Expanded Fluid	Quantitative Reasoning	Working Memory	Auditory Working Memory	Processing Speed	Full Scale	General Ability	Nonverbal Ability	Cognitive Proficiency	Naming Speed	Symbol Translation	Storage and Retrieval
Avg. Internal Consistency		.92	.95	.92	.93	.95	.95	.92	.93	.88	.96	.96	.95	.93	.90	.94	.94
Similarities	.87	•	•								•	•					
Vocabulary	.87	•	•								•	•					
Information	.86		•														
Comprehension	.83		•														
Block Design	.84			•							•	•	•				
Visual Puzzles	.89			•									•				
Matrix Reasoning	.87				•	•					•	•	•				
Figure Weights	.94				•	•	•				•	•	•				
Picture Concepts	.83					•											
Arithmetic	.90					•	•										
Digit Span	.91							•	•		•			•			
Picture Span	.85							•					•	•			
Letter-Number Sequencing	.86								•								
Coding	.82									•	•		•	•			
Symbol Search	.81									•				•			
Cancellation	.82																
Naming Speed Literacy	.86														•		•
Naming Speed Quantity	.83														•		•
Immediate Symbol Trans.	.88															•	•
Delayed Symbol Trans.	.87															•	•
Recognition Symbol Trans.	.82															•	•

Note: Storage and Retrieval is calculated from the sum of the NSI and STI standard scores, not from the sum of the five Naming Speed and Symbol Translation subtests.

Table 1.6. Classification of WISC-V Subtest *g*-Loadings

Subtest	High Average *g*-loadings (.71–.78)	Moderate Average *g*-loadings (.56–.70)	Low Average *g*-loadings (.24–.49)
Vocabulary	✓		
Information	✓		
Similarities	✓		
Arithmetic	✓		
Digit Span	✓		
Letter-Number Sequencing	✓		
Visual Puzzles		✓	
Block Design		✓	
Comprehension		✓	
Matrix Reasoning		✓	
Figure Weights		✓	
Picture Span		✓	
Picture Concepts		✓	
Symbol Search			✓
Coding			✓
Cancellation			✓

Source: Sattler, J. M., Dumont, R., & Coalson, D. L. (2016). *Assessment of children: WISC-V and WPPSI-IV*. San Diego, CA: Jerome M. Sattler Publishing.

Note: Subtest *g*-loadings are also available in the *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b, p. 84).

common among individuals with very high FSIQs. The opposite is true of individuals with very low GAIs. About 30% of individuals with GAIs below 80 have CPIs that are a full standard deviation above their GAIs.

Structure of the WISC-V

In order to use the interpretive approach we advocate, practitioners need to have a thorough understanding of the theoretical structure of the test batteries they use. Combining scores from subtests with diverse formats allows practitioners to be more confident that the ability estimates are reliable and valid. For this reason, the WISC-V offers two to four subtests with distinct formats for each of the six broad abilities (i.e., Gc, Gv, Gf, Gsm, Gs, Glr) that the WISC-V is designed to measure.

Verbal Comprehension Subtests: Similarities, Vocabulary, Information, and Comprehension

These subtests are measures of what in CHC Theory is called *Crystallized Intelligence* (Gc), or acquired knowledge and language comprehension. The VCI summarizes performance on the Similarities and Vocabulary subtests. When all four subtests are administered, the performance is summarized by the Verbal (Expanded Crystallized) Index (VECI; Raiford, Drozdick, Zhang, & Zhou, 2015; see Appendix B for the norms for this composite). Rapid Reference 1.4 provides new clinical composites that are made up of different combinations of subtests that measure Gc. The norms corresponding to these composites are located in Appendix B. These clinical composites are automatically generated in X-BASS, a program that is described in Chapter 4 and is used to assist in WISC-V interpretation.

Rapid Reference 1.4

New Gc Clinical Composites for the WISC-V

Clinical Composite	Subtest Composition	Brief Description
Gc (Verbal Expression–Low) **Gc-VE/L**	Vocabulary Information	These two subtests form a broad Gc ability and require less verbal expression compared to the other Gc subtests (e.g., one- or two-word responses as compared to multiword responses or sentences). An alternative label for this composite is Retrieval from Remote Long-Term Storage (RFLT-Remote), which provides an estimate of an individual's ability to retrieve information from long-term storage that was encoded weeks, months, or years ago.
Gc (Verbal Expression–High) **Gc-VE/H**	Similarities Comprehension	These two subtests require greater verbal expression to earn maximum credit compared to the other Gc subtests and typically involve some degree of reasoning ability.
VECI	Similarities Vocabulary Information Comprehension	Provides a robust estimate of Gc as compared to the VCI, spanning two narrow ability domains (VL – Lexical Knowledge and K0 – General Information). Requires reasoning with verbal information. Involves tests that have low to high demands for verbal expression.

Note: Norms for Gc Clinical Composites are included in Appendix B and X-BASS (Ortiz et al., 2017). Norms for the VECI were also published in Raiford et al. (2015) and Kaufman et al. (2016).

In some ways, the Gc subtests are the crown jewels of the cognitive assessment field. To be sure, other batteries have tests of verbal knowledge and language ability. However, there is something special about these four subtests in that they tend to elicit particularly rich samples of verbal behavior. There is a feeling of knowing that experienced clinicians have with these tests that does not happen to the same degree with other verbal knowledge tests. Unquantifiable nuances in cognitive style are often discerned from listening closely to how children reason through items in their zone of proximal development. For example, some children answer only when they are sure they are right, whereas others say the first thing that pops into their heads with little hesitation and, right or wrong, with extreme self-confidence.

Wechsler selected verbal knowledge items that measured the sort of things that people could find out for themselves, even if they did not come from privileged backgrounds (though this undoubtedly is an advantage on at least some items). In particular, academic and specialized knowledge was avoided (Wechsler, 1944, p. 82). A close inspection of the verbal items from the WISC-V reveals that the easy items are not merely easy nor are the difficult items merely difficult. The easy items tend to be about practical knowledge and daily living skills and the more difficult items tend not to be about practical knowledge, but nevertheless topics one would wish well-informed voters knew something about.

In terms of CHC narrow abilities, Vocabulary is a measure of Lexical Knowledge and Information is a measure of General (Verbal) Information. Attempts have been made to fit Similarities and Comprehension in the CHC taxonomy, but it is not clear that they fit neatly into any narrow CHC domain. Similarities and Comprehension are probably best viewed as excellent measures of broad verbal comprehension (Gc) and as complex measures of several different narrow abilities. By way of example, consider the complexities of the Similarities subtest.

At first glance, Similarities appears to be similar to Vocabulary in that one must understand words to do well. However, even the most difficult items on the Similarities subtest consist of pairs of very easy words that are among the most frequently used words in the English language. It is not so much knowledge of word definitions that is required on the Similarities subtest, but a deeper understanding of how knowledge is structured in our culture. Flynn (2007b, p. 34) argues that it measures the degree to which a person sees the world with scientific spectacles, placing objects and ideas into abstract categories (e.g., hills and streams are both geographical features) instead of in functional relationships, as most people have done for most of human history (e.g., streams run down hills). It is likely that Similarities draws on reasoning ability (i.e., the narrow CHC factor Inductive Reasoning), but only on the more difficult items. It is easy to observe that most children are not really reasoning through the first few easy items. They are simply drawing on their background knowledge of how familiar items have been grouped in the past (e.g., blue and yellow are both colors). However, at some point the words are no longer paired in familiar ways, and figuring out how they are related requires careful thought. From this perspective, Similarities requires a complex mix of background knowledge retrieved from memory and on-the-spot reasoning.

Fluid Reasoning Subtests: Matrix Reasoning, Figure Weights, Picture Concepts, and Arithmetic

Fluid Reasoning is the ability to use logic to solve unfamiliar problems. Matrix Reasoning and Figure Weights compose the FRI and the four tests together make up the Expanded Fluid Index (EFI; see Appendix B or Raiford et al., 2015 for EFI norms). The EFI is described in Rapid Reference 1.5. Performance on the Figure Weights and Arithmetic subtests is summarized by the Quantitative Reasoning Index (QRI).

DON'T FORGET

An Expanded Fluid Index may be derived using four WISC-V subtests.

Rapid Reference 1.5

New Gf Clinical Composite for the WISC-V

Clinical Composite	Subtest Composition	Brief Description
EFI	Matrix Reasoning Figure Weights Picture Concepts Arithmetic	Provides a more robust estimate of Gf as compared to the FRI, spanning three narrow ability domains, including Induction (I), General Sequential Reasoning (RG), and Quantitative Reasoning (RQ). Places more emphasis on quantitative reasoning as compared to FRI.

Note: Norms for the EFI are included in Appendix B and X-BASS (Ortiz et al., 2017). Norms for the EFI were also published in Raiford et al. (2015) and Kaufman et al. (2016).

In terms of an intuitive application of CHC Theory to these subtests, Matrix Reasoning and Picture Concepts are measures of Inductive Reasoning, Figure Weights measures General Sequential Reasoning, and Arithmetic is a measure of Quantitative Reasoning. Unfortunately, factor analytic evidence suggests that these intuitive classifications are perhaps a little simplistic. In Table 1.7, the loadings are displayed from a principal factors exploratory factor analysis (with oblimin rotation) of the correlation matrix in Table 5.1 from the *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b).

As can be seen in Table 1.7, the Gc, Gsm, and Gs factors are very well defined, with fairly clean measures of each factor. However, the Gv and Gf factors are not clearly separate, a finding supported by Sattler et al. (2016, p. 78). Many subtests appear to be mixed measures of several factors, especially the subtests intended to measure fluid reasoning. Picture Concepts and Arithmetic have small loadings on the Verbal Comprehension (Gc) factor. Matrix Reasoning and Picture Concepts

Table 1.7 An Exploratory Factor Analysis of the WISC-V Subtests

Subtest	Gc	Gsm	Gs	Gv	Gf
Similarities	.75				
Vocabulary	.86				
Information	.77				
Comprehension	.70				
Block Design				.55	
Visual Puzzles				.81	
Matrix Reasoning				.23	.24
Figure Weights					.62
Picture Concepts	.26			.20	
Arithmetic	.22	.32			.27
Digit Span		.80			
Picture Span		.55			
Letter-Number Sequencing		.77			
Coding			.75		
Symbol Search			.76		
Cancellation			.45		

Note: Loadings less than .20 were omitted.

have small loadings on the Visual Spatial (Gv) factor. The Fluid Reasoning (Gf) factor does not seem to be well defined, a common finding with current and previous editions of the WISC (Canivez & Watkins, 2016; Weiss, Keith, Zhu, & Chen, 2013). Consider these facts from Table 5.1 of the *WISC-V Technical and Interpretive Manual* carefully:

- Although Matrix Reasoning and Picture Concepts are classified as measures of reasoning, their correlation is only 0.35.
- Matrix Reasoning's correlation with Picture Concepts is lower than its correlation with every other subtest, except for the three Processing Speed Subtests.
- Picture Concepts has a higher correlation with Vocabulary and Information than it does with any of the other Fluid Reasoning subtests.

What this means is that practitioners cannot apply test labels and CHC classifications from previous editions of the WISC unthinkingly. Expect Matrix Reasoning and Picture Concepts scores to diverge often.

Visual Spatial Processing Subtests: Block Design and Visual Puzzles

In terms of CHC Theory, these subtests measure Gv in general and visualization (Vz) in particular. That is, they measure the ability to perceive patterns and solve problems in the mind's eye by manipulating visual imagery.

After the Object Assembly subtest was dropped, Block Design was the only good measure of visual spatial ability on the WISC-IV. Visual Puzzles is therefore a welcome addition to the WISC-V. However, Visual Puzzles fits the trend in which the new tests are psychometrically clean, but do not permit the examiner to observe problem-solving behavior in real time.

Working Memory Subtests: Digit Span, Picture Span, and Letter-Number Sequencing

These subtests are measures of working memory capacity, the ability to maintain and manipulate information in short-term memory in order to solve multistep problems. Digit Span Forward is a measure of the CHC narrow ability Memory Span (MS). The remaining subtests are best conceptualized as measures of general working memory. Digit Span and Picture Span make up the WMI and Digit Span is paired with Letter-Number Sequencing to make up the Auditory Working Memory Index (AWMI). Rapid Reference 1.6 provides new clinical composites that are made up of different combinations of working memory subtests. The norms corresponding to these composites are located in Appendix B.

Rapid Reference 1.6

New Gsm Clinical Composites for the WISC-V

Clinical Composite	Subtest Composition	Brief Description
Working Memory (Alternative) **Gsm-MW (Alt)**	Digit Span Backward Digit Span Sequencing Letter-Number Sequencing	Provides an alternative to the Auditory Working Memory Index (AWMI) by eliminating Digit Span Forward (a measure of memory span).
Memory Span-Working Memory **Gsm-MS,MW**	Digit Span Forward Digit Span Backward	Provides a balance of Memory Span and Working Memory Capacity and is consistent with the composition of the Digit Span subtest on the WISC-IV.
Working Memory (Cognitive Complexity—High) **WM-CC/H**	Arithmetic Picture Span	Provides an estimate of Working Memory Capacity with subtests that are more cognitively complex than Digit Span. Arithmetic involves Gf (e.g., Quantitative Reasoning), Gc, and Gsm (Working Memory Capacity). Picture Span involves Gv (Visual Memory), Memory Span, and Working Memory Capacity due to proactive interference.

Note: Norms for the new Gsm clinical composites are included in Appendix B and X-BASS (Ortiz et al., 2017).

Of the Working Memory subtests included on the WISC-V, only Digit Span was selected by Wechsler, and he did so reluctantly (Wechsler, 1958):

> To act intelligently one must be able to recall numerous items, i.e., have a retentive memory. But beyond a certain point this ability will not help much in coping with life situations successfully. (p. 7)

Although it is easy to give, score, and interpret, he claimed that Digit Span did not measure general intelligence very well, especially for high ability individuals (Wechsler, 1958, p. 71). Digit Span was retained mostly because it was extremely good at discriminating different levels of intelligence at the low end of the scale.

On the WISC-V, the nature of Digit Span has been changed by the inclusion of the Digit Span Sequencing sub-subtest, making it more of a measure of working memory capacity than a simple memory span subtest. It is difficult to know what David Wechsler would say about Picture Span and Letter-Number Sequencing. Most likely he would acknowledge their clinical utility but also fret that they, like Digit Span, do not capture what he meant by *general intelligence*.

Processing Speed Subtests: Coding, Symbol Search, and Cancellation

These three subtests are measures of Processing Speed (Gs), the ability to fluently deploy the focus of one's attention to process information quickly. Cancellation's loadings on Gs are considerably lower than those of Coding and Symbol Search. Nevertheless, if an "Expanded Processing Speed Index" (EPS) is desired, it can be calculated like so:

$$EPS = \frac{CD + SS + CA\ \text{-}30}{0.4656} + 100$$

Rapid Reference 1.7 provides an alternative to the PSI and EPS. Specifically, it includes a new Perceptual Speed (Gs-P) clinical composite that reduces memory and motor dexterity demands.

DON'T FORGET

Norms are also available for a new Gs clinical composite.

Rapid Reference 1.7

New Gs Clinical Composite for the WISC-V

Clinical Composite	Subtest Composition	Brief Description
Perceptual Speed **Gs-P**	Symbol Search Cancellation	Provides an alternative to the PSI, reducing the memory and motor dexterity demands inherent mainly in the Coding subtest.

Note: Norms for the new Gs clinical composite are included in Appendix B and X-BASS (Ortiz et al., 2017). Norms for this composite were first published in Kaufman et al. (2016).

Wechsler believed that the popularity of the digit-symbol paradigm was "fully merited" (Wechsler, 1958, p. 81), even though he did not give any explanation as to how it was a good measure of his definition of general intelligence. Even though it had the lowest loading on the general factor of his original tests, it was valuable because it was sensitive to a wide variety of outcomes, including brain injury, psychological disorders, and the general effects of aging. The newcomer subtests of Symbol Search and Cancellation continue the trend of reduced complexity, though Cancellation does reveal different uses of strategy in some individuals.

Long-Term Storage and Retrieval Subtests: *Naming Speed Literacy, Naming Speed Quantity, Immediate Symbol Translation, Delayed Symbol Translation, and Recognition Symbol Translation*

The five Long-Term Storage and Retrieval (Glr) subtests are new to the WISC-V. In terms of CHC theory, these subtests measure narrow aspects of Glr. Naming Speed Literacy and Naming Speed Quantity measure Naming Facility, or the ability to rapidly produce names of familiar concepts or common objects that are in the individual's long-term memory store. The Naming Speed Literacy subtest, for example, requires the individual to name pictures or letters and numbers rapidly. Immediate Symbol Translation, Delayed Symbol Translation, and Recognition Symbol Translation measure Associative Memory, or the ability to recall one part of a previously learned but unrelated pair of items (that may or may not be meaningfully linked) when the other part is presented. The addition of Glr subtests on the WISC-V was one of the most significant and positive revisions, particularly because Glr abilities are important for learning and academic success. Also, the Glr subtests on the WISC-V measure processes that are important in the evaluation and diagnosis of specific learning disabilities (e.g., Feifer, Gerhardstein Nader, Flanagan, Fitzer, & Hicks, 2014). A new clinical composite is available that is comprised of Delayed Symbol Translation and Recognition Symbol Translation. This composite is called Retrieval from Recent Long-Term Storage (RFLT-Recent; see Rapid Reference 1.8). Comparing this composite to the new Gc clinical composite comprised of Vocabulary and Information (or RFLT-Remote) may provide useful information about an individual's ability to retrieve recently encoded information compared to information that was encoded weeks, months, or years ago.

DON'T FORGET

Norms are also available for a new Glr clinical composite.

Rapid Reference 1.8

New Glr Clinical Composite for the WISC-V

Clinical Composite	Subtest Composition	Brief Description
Retrieval from Recent Long-Term Storage **RFLT-Recent**	Delayed Symbol Translation Recognition Symbol Translation	Provides an estimate of an individual's ability to retrieve recently encoded information from long-term storage.

Note: Norms for the new Glr clinical composite are included in Appendix B and in X-BASS (Ortiz et al., 2017).

WISC-V Relations With Other Variables

In addition to structural validity, the WISC-V is supported by correlations with scores on other comprehensive measures of cognitive ability and achievement in normal and special groups (Wechsler, 2014b). Specifically, WISC-V criterion validity studies included the WISC-IV, WPPSI-IV, WAIS-IV, KABC-II, KTEA-3, WIAT-III, Vineland-II, and BASC-2. The relationships between the WISC-V Primary Index Scales and the scales of each of these instruments for normal and special groups are reported in Tables 1.8 and 1.9, respectively. Overall, these studies provide good support for the criterion validity of the WISC-V. However, it is important to note that all of the instruments included in these studies were published by Pearson. In addition, some of the special group studies included very small sample sizes (e.g., < 40 participants; see Sattler et al., 2016, for a more extensive review).

Wechsler's IQ vs. Spearman's *g*: Is the FSIQ the Only Score Worth Interpreting?

Shocking as it may seem, scholars disagree about things from time to time. This is a healthy state of affairs. Rivalries often inspire us to work at our peak capacity. There is a group of scholars who, unlike us, believes that the general factor of intelligence (*g*) is the only construct that should be interpreted on intelligence tests such as the WISC-V (Canivez, Watkins, & Dombrowski, in press; Glutting, Watkins, Konold, & McDermott, 2006; McDermott, Fantuzzo, & Glutting, 1990). They do not deny that other ability factors exist, nor that the general factor is the only score that predicts important outcomes. However, their

Table 1.8. Summary of Special Group Studies With the WISC-V for Primary Index Scales and FSIQ

		Primary Index Scale											
		Verbal Comprehension Index		Visual Spatial Index		Fluid Reasoning Index		Working Memory Index		Processing Speed Index		FSIQ	
Special Group	N	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Intellectually Gifted	95	127.7	12.3	121.2	11.5	120.3	12.0	117.9	11.7	112.9	13.5	127.5	8.8
Mild Intellectual Disability	74	66.0	10.9	66.0	9.9	67.0	11.0	65.1	10.5	71.6	16.2	60.9	8.9
Moderate Intellectual Disability	37	55.2	11.3	56.8	9.6	58.6	12.0	58.3	10.6	59.3	15.8	49.7	8.9
Borderline Intellectual Functioning	20	81.7	7.6	83.1	8.3	87.1	11.7	78.2	11.9	95.1	11.9	80.4	5.7
Specific Learning Disorder—Reading	30	89.1	11.2	93.3	14.1	92.5	10.8	87.8	10.1	93.0	15.3	88.9	10.5
Specific Learning Disorder—Reading and Written Expression	22	86.5	10.1	96.2	13.3	88.4	12.2	85.8	9.7	93.0	15.8	84.8	11.1
Specific Learning Disorder—Math	28	90.3	13.7	85.4	12.6	82.2	15.4	88.7	13.5	90.2	14.2	83.6	11.9
Attention-Deficit/Hyperactivity Disorder	48	97.8	11.4	97.3	16.7	97.6	13.4	94.8	13.3	94.2	13.9	95.6	11.7
Disruptive Behavior	21	94.1	11.8	97.1	13.9	94.4	15.2	95.3	13.7	92.8	17.1	93.3	12.4
Traumatic Brain Injury	20	88.9	12.9	87.5	15.9	88.4	18.0	86.2	15.5	84.1	22.2	83.3	14.1
English Language Learners	16	85.6	11.7	93.4	12.3	95.2	13.7	87.8	13.0	97.6	15.7	87.6	10.6
Autism Spectrum Disorder With Language Impairment	30	80.4	18.2	82.8	22.3	84.3	20.6	77.6	19.4	75.8	19.0	76.3	19.1
Autism Spectrum Disorder Without Language Impairment	32	102.5	14.4	100.7	17.1	100.9	17.5	95.4	16.8	89.4	18.4	98.3	17.4

Source: Adapted from *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b) and reformatted by Sattler, Dumont, and Coalson in *Assessment of Children: WISC-V and WPPSI-IV* (2016), with permission of Jerome M. Sattler, Publisher, Inc.

Table 1.9 Summary of WISC-V Criterion Validity Studies for the Primary Index Scales and FSIQ

	Primary Index Scale					
Criterion	VCI	VSI	FRI	WMI	PSI	FSIQ
WISC-IV						
Verbal Comprehension	.81	--	--	--	--	--
Perceptual Reasoning	--	.62	.61	--	--	--
Working Memory	--	--	--	.59	--	--
Processing Speed	--	--	--	--	.70	--
Full Scale IQ	--	--	--	--	--	.81
WPPSI-IV						
Verbal Comprehension	.64	--	--	--	--	--
Visual Spatial	--	.57	--	--	--	--
Fluid Reasoning	--	--	.45	--	--	--
Working Memory	--	--	--	.46	--	--
Processing Speed	--	--	--	--	.34	--
Full Scale IQ	--	--	--	--	--	.74
WAIS-IV						
Verbal Comprehension	.80	--	--	--	--	--
Perceptual Reasoning	--	.78	.56	--	--	--
Working Memory	--	--	--	.72	--	--
Processing Speed	--	--	--	--	.79	--

(continued)

	Primary Index Scale					
Criterion	VCI	VSI	FRI	WMI	PSI	FSIQ
Full Scale IQ	--	--	--	--	--	.84
KABC-II						
Sequential/Gsm	.36	.20	.17	.63	-.06	.44
Simultaneous/Gv	.34	.53	.41	.27	.25	.55
Learning/Glr	.45	.33	.38	.43	-.19	.44
Planning/Gf	.44	.51	.50	.23	.05	.54
Knowledge/Gc	.74	.55	.52	.38	.06	.72
Fluid-Crystallized	.72	.65	.63	.63	.04	.81
Mental Processing	.64	.64	.60	.65	.04	.77
Nonverbal	.41	.60	.49	.41	.21	.64
KTEA-3						
Reading	.77	.47	.56	.54	.20	.75
Math	.67	.57	.66	.49	.32	.79
Written Language	.61	.39	.47	.51	.34	.69
Academic Skills Battery	.76	.54	.63	.58	.35	.82
Sound-Symbol	.55	.45	.48	.55	.15	.66
Decoding	.57	.43	.41	.52	.12	.63
Reading Fluency	.58	.43	.35	.48	.36	.65
Reading Understanding	.76	.47	.55	.50	.18	.74
Oral Language	.70	.47	.48	.42	.29	.68

Oral Fluency	.43	.28	.33	.36	.40	.49
Comprehension	.78	.48	.58	.49	.21	.75
Expression	.64	.42	.45	.45	.25	.66
Orthographic Processing	.51	.32	.34	.53	.39	.61
Academic Fluency	.42	.25	.23	.38	.47	.52
WIAT-III						
Oral Language	.78	.44	.33	.56	.22	.74
Total Reading	.65	.30	.32	.53	.29	.70
Basic Reading	.53	.24	.30	.54	.19	.61
Reading Comprehension and Fluency	.65	.30	.25	.40	.36	.65
Written Expression	.60	.39	.33	.47	.33	.68
Mathematics	.53	.44	.45	.46	.41	.71
Math Fluency	.36	.28	.31	.39	.51	.58
Total Achievement	.74	.46	.40	.63	.34	.81
Vineland-II						
Communication	.21	.09	.28	.41	-.02	.27
Daily Living Skills	.04	.03	-.05	-.01	.07	.02
Socialization	-.06	-.33	-.20	.11	-.16	-.12
Adaptive Behavior Composite	.04	-.12	-.04	.19	-.08	.01

(continued)

Criterion	Primary Index Scale					
	VCI	VSI	FRI	WMI	PSI	FSIQ
Maladaptive Behavior Index	.07	.06	.05	-.16	-.16	-.04
BASC-2 PRS						
Resiliency	.10	.07	.08	.10	.07	.12
Conduct Problems	-.16	-.10	-.13	-.12	-.08	-.17
Executive Functioning	-.11	-.07	-.10	-.08	-.08	-.14
Attention Problems	-.16	-.08	-.15	-.16	-.15	-.20

Note: Abbreviations for primary index scores: VCI = Verbal Comprehension Index, VSI = Visual Spatial Index, FRI = Fluid Reasoning Index, WMI = Working Memory Index, PSI = Processing Speed Index, FSIQ = Full Scale IQ.
Abbreviations for tests: WISC-IV = *Wechsler Intelligence Scale for Children–Fourth Edition*, WPPSI-IV = *Wechsler Preschool and Primary Scale of Intelligence–Fourth Edition*, WAIS-IV = *Wechsler Adult Intelligence Scale–Fourth Edition,* KABC-II = *Kaufman Assessment Battery for Children–* Second Edition, KTEA-3 = *Kaufman Tests of Educational Achievement–Third Edition,* WIAT-III = *Wechsler Individual Achievement Test–Third Edition*, BASC-2 PRS = *Behavior Assessment System for Children–Second Edition, Parent Rating Scale*s.

Source: Adapted from *WISC-V Technical and Interpretive Manual* (Wechsler, 2014b) and reformatted by Sattler, Dumont, and Coalson in *Assessment of Children: WISC-V and WPPSI-IV* (2016), with permission of Jerome M. Sattler, Publisher, Inc.

argument is that the general factor is the only construct that is measured well enough on intelligence tests such as the WISC-V to be of practical use with individuals. They contend that the other factors are so poorly measured that there is little reason to interpret them. Furthermore, even if they were measured well, these scholars cite and provide evidence that the smaller factors' effects on important outcomes is typically so small that it probably would not matter much in the best of circumstances (Glutting et al., 2006).

Are they right? Is the general factor the only construct worth considering on the WISC-V? A proper and complete answer to this question is probably too technical for a book with the word *Essentials* in its title. However, we give a brief explanation as to why we believe that this argument is overstated.

There are several points on which we agree with these scholars. First, professionals should be aware of the limitations of their instruments. It serves no purpose to make or believe in exaggerated claims about the utility of test scores. Second, we agree that measurement error is inherent in all psychological measures and that to the degree that a measure is unreliable, confidence in the validity of the measure may be compromised. We agree that the available reliability and validity evidence suggests that we should be cautious when interpreting the smaller factors of ability (e.g., visual spatial ability, working memory, processing speed) on intelligence tests such as the WISC-V. However, we believe that there are methods and guidelines by which one can responsibly use and interpret measures of these smaller factors. Indeed, we believe that in many cases it is our ethical responsibility to do so.

Even scholars who discourage the use of any scores beyond the FSIQ have shown that in earlier editions of the Wechsler scales, factor index scales have incremental validity in predicting academic outcomes (e.g., Canivez, 2013; Glutting et al., 2006; Nelson, Canivez, & Watkins, 2013). In many cases, the improvements in predictive validity were small (2% to 4% additional variance explained), but in some cases they were fairly large (9% to 30% additional variance explained). However, even when the improved prediction is small, why would one not make use of the improved prediction that comes with factor index scores if one has the means to do so? Who would want a worse prediction if a better one is easily available?

Looking beyond the FSIQ is not just a way of obtaining better predictions. Doing so allows for better explanations and case conceptualizations. We agree with James Flynn (2007a):

> Despite all the triumphs of the concept of general intelligence, I believe intelligence is like the atom: you have to know both why its parts cohere and why they sometimes fly apart. (n.p.)

There are some applications of intelligence testing in which it probably does little harm to fly low to the ground and stick with just the FSIQ. However, when faced with unusual profiles of ability in cases with documented brain injuries and neurological disorders, a straight-up interpretation of the FSIQ is just silly. Suppose that after a severe head injury a previously highly disciplined child has difficulty focusing on homework without becoming mentally fatigued and distracted. The WISC-V profile of scores suggests very low processing speed (PSI = 68) and low working memory (WMI = 79). The remaining scores are a bit above average and the FSIQ is in the average range. Are we to ignore this information and tell the child's parents that no cognitive deficits were detected? Should we not conduct follow-up tests to verify that the WMI and PSI scores are indeed much lower than expectations? We believe that not only can this be done, but it must.

We are not arguing that the FSIQ is bad and the factor index scores are good. FSIQ and the factor index scores are different tools for looking at abilities, and good practitioners can alternate between them flexibly. One tool is fairly accurate and has the virtue of simplicity. The other is more accurate, but the onus is on the user to manage the complexity of multiple scores properly. This is a real concern and we therefore appreciate that there are scholars who hold our feet to the fire and challenge our assumptions. However, we also believe that with rigorous training and a flexible mind-set, it is possible for practitioners to use both kinds of scores responsibly. It is our hope that the information and guidance presented in subsequent chapters of this book will assist practitioners in applying theory, research, and psychometric rigor to the test interpretation process, allowing for examination and interpretation of all scores.

TEST YOURSELF

1. Performance on intelligence tests is a potent predictor of what important life outcomes?

a. Academic achievement

b. High school graduation

c. Income

d. All of the above

2. The Wechsler scales displaced the Stanford-Binet to become the dominant clinical measure of intelligence.

a. True

b. False

3. Why did David Wechsler create his tests?

a. For research use
b. For clinical use
c. For research use and clinical use
d. To measure unidimensional traits

4. How did Wechsler express IQ scores?

a. Standard scores
b. Intelligence quotients
c. Mental age
d. Chronological age

5. Which subtest remains constant in the WISC-III Perceptual Organization Index (POI), the WISC-IV Perceptual Reasoning Index (PRI), and the WISC-V Visual Spatial Index (VSI)?

a. Picture Completion
b. Object Assembly
c. Block Design
d. Mazes

6. Which of the following WISC-V composites allows one subtest substitution?

a. PRI
b. FSIQ
c. WMI
d. PSI

7. Wechsler selected verbal knowledge items that measured the sort of things that required academic and specialized knowledge.

a. True
b. False

8. Why was Digit Span retained in the WISC-V?

a. It is good at discriminating different levels of intelligence at the low end of the scale.
b. It is good at discriminating different levels of intelligence at the high end of the scale.
c. It is a good measure of general intelligence.
d. It is the best measure of working memory capacity.

9. Which of the following Glr subtests were included in the WISC-IV and WISC-V?

a. Naming Speed Quantity
b. Naming Speed Literacy
c. Immediate Symbol Translation
d. No Glr subtests were included in the WISC-IV.

10. Results of exploratory factor analysis show that two factors contain subtests that have significant loadings on another factor. Which two factors are these?

a. Gf and Gv

b. Gsm and Gs

c. Gc and Gv

d. Gc and Gs

Answers: 1. d; 2. a; 3. b; 4. a; 5. c; 6. b; 7. b; 8. a; 9. d; 10. a

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