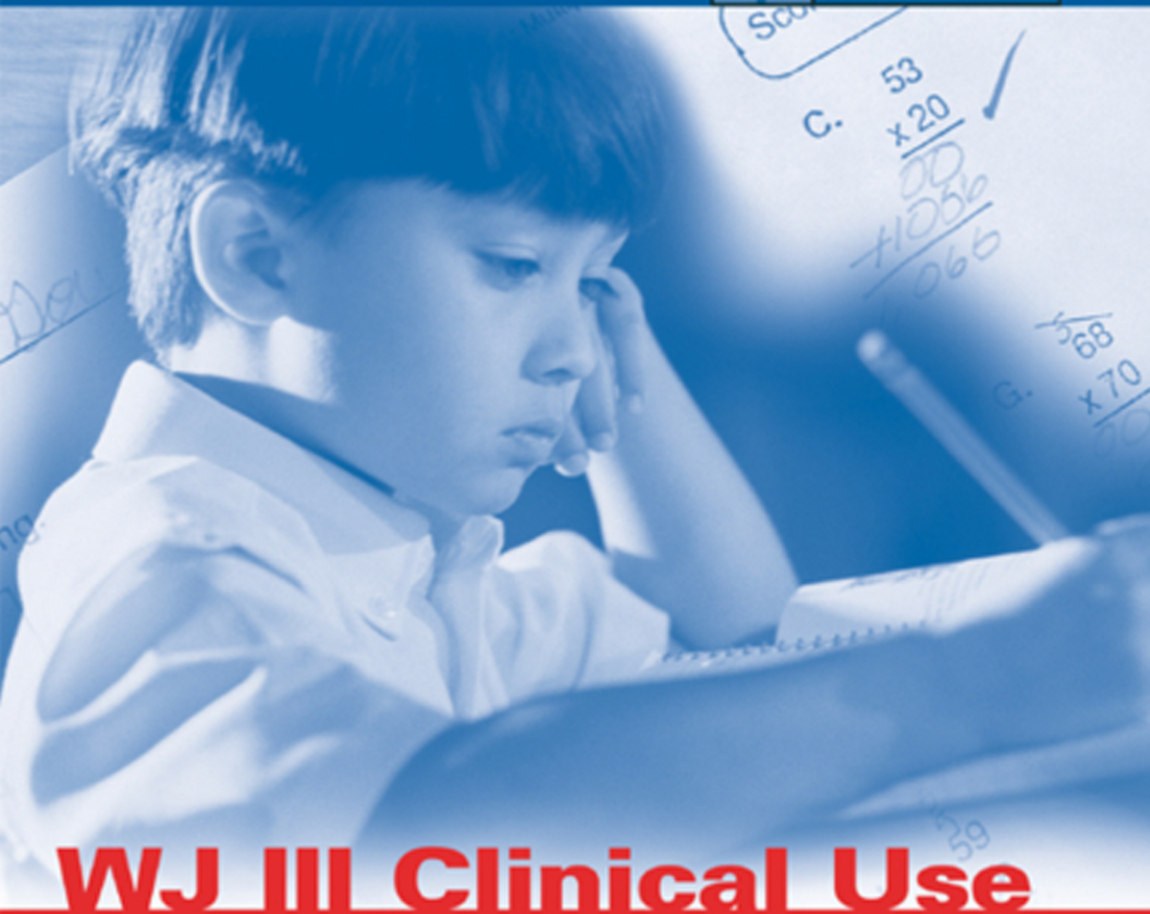
PRACTICAL RESOURCES for the Mental Health PROFESSIONAL



WJ III Clinical Use and Interpretation

Scientist–Practitioner Perspectives

Fredrick A. Schrank
Dawn P. Flanagan

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The *Woodcock–Johnson III Tests of Cognitive Abilities* in Cognitive Assessment Courses

Jeffery P. Braden and Vincent C. Alfonso

Preface

The Woodcock–Johnson III (WJ III) is an extensive revision of its predecessor, expanded in depth, breadth, and complexity. It is widely used for assessing the cognitive abilities, oral language capabilities, and academic achievement levels of children, adolescents, and adults. The WJ III includes extensive examiner and technical manuals, and several interpretive texts are available. Although much is already written about how to interpret the WJ III, a need exists for documenting its clinical utility, particularly from a scientist–practitioner perspective. To address this need, *WJ III Clinical Use and Interpretation* presents a wide variety of exemplary clinical applications of the WJ III from its leading experts.

In the introductory chapter of this volume (Chapter 1), Floyd, Shaver, and McGrew summarize the scientific evidence that can be used as a basis for interpretation of the WJ III, particularly as it applies to the *Tests of Cognitive Abilities* (WJ III COG). The authors provide data that support interpretation of the WJ III Cattell-Horn-Carroll factor clusters. The evidence suggests that the WJ III can provide insight into cognitive ability deficits associated with a number of clinical conditions. Next, Read and Schrank (Chapter 2) articulate an analytic method for deriving qualitative information from observable attributes of an individual's performance on the WJ III. Mather and Wendling (Chapter 3) explain how patterns of WJ III cluster and test scores can be used to inform instruction when gathered as part of an intensive diagnostic study of an individual. Although the focus of their chapter is on the WJ III *Tests of Achievement* (WJ III ACH), they describe how patterns of both the WJ III COG and WJ III ACH cluster and test scores can assist with interpretation and formulation of diagnostic hypotheses.

Traditionally, the Woodcock–Johnson has been used for assessment of children, adolescents, and adults with suspected or known learning disabilities.

Four chapters in this volume reflect the utility—and diversity—of clinical applications of the WJ III for learning disabilities identification and diagnosis. Gregg, Coleman, and Knight (Chapter 4) review three models for learning disabilities determination, and advocate for use of a clinical model that integrates quantitative data, qualitative data, self-report background information, and the clinical judgments of a multidisciplinary team. These authors integrate extant scientific and clinical knowledge of learning disabilities in a case study approach that illustrates the usefulness of the WJ III in diagnosing reading, mathematics, and written language disabilities. Mather and Schrank (Chapter 5) describe how to use the various WJ III discrepancy procedures for learning disability identification and diagnosis, emphasizing the benefits of the intra-ability discrepancy procedures for determining profiles of educationally-relevant strengths and weaknesses. Flanagan (Chapter 6) demonstrates the use of the WJ III within the context of an operational definition of learning disabilities that includes a "below-average aptitude-achievement consistency analysis" for the identification and diagnosis of learning disabilities. Phelps and McGrew (Chapter 7) provide a rationale and step-by-step procedure for using correction for regression when comparing the *Wechsler Intelligence Scale for Children-III* (WISC-III) and the *Wechsler Adult Intelligence Scale-III* (WAIS-III) to the WJ III ACH for determining the presence and severity of ability/achievement discrepancies.

Increasingly, the WJ III is being used with populations other than individuals suspected of having specific learning disabilities. Therefore, several chapters in this volume illustrate the principle of selective testing to address the specific assessment needs of gifted children and adolescents, young children (including preschool children), and children with Attention Deficit/Hyperactivity Disorder (ADHD). Tusing, Maricle, and Ford (Chapter 8) review the developmental nature of cognitive abilities in preschool children that provides guidance for selecting WJ III tests and clusters that best represent the cognitive capabilities of young children. Gridley, Norman, Rizza, and Decker (Chapter 9) highlight the value of the WJ III in identification of gifted children and adolescents, particularly for documentation of superior performance in general intellectual ability and/or a specific intellectual ability. Additionally, the authors compared overall scores from the WISC-III and WJ III COG using a combined sample and developed a regression model to determine the equivalence of cut-off scores for identification purposes. Ford, Keith, Floyd, Fields, and Schrank (Chapter 10) present the results of a study using the WJ III Executive Processes, Broad Attention, and Working Memory tests and selected checklists from the *Report Writer for the WJ III* for diagnosis of ADHD. Based on their study, and a review of previous research, they recommend a set of WJ III tests, clusters, and checklists that may be useful in the identification of ADHD.

More than ever before, the WJ III is being utilized in the fields of neuropsychology and school psychology and this has resulted in an increased need for training models. For example, graduate training programs in school and applied psychology are embracing contemporary models of intellectual ability assessment,

and the WJ III COG is now used as a primary theoretical and applied training tool in more than one-third of all school psychology training programs. Dean, Woodcock, Decker, and Schrank (Chapter 11) describe a cognitive neuropsychological model for interpreting an individual's performance on the WJ III. They articulate a method for determining an individual's functional levels in a broad array of cognitive, academic, and sensory-motor functions and present two case studies that demonstrate use of the functional levels. Braden and Alfonso (Chapter 12) review historical surveys of cognitive ability assessment courses and propose a paradigm shift whereby intellectual ability assessment courses are taught by providing innovative ways of integrating the WJ III COG into existing course content.

As editors, we thank all those who contributed to this volume for their expertise, time, and adherence to the scientist–practitioner model. In addition to the chapter authors, we are indebted to a stellar team of professionals who edited text, designed figures, and produced the finished volume, including Carissa Kowalski, Kaaren Watson-Winkler, Kristi Anderson, Barbara Makinster, and Nikki Levy.

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1

Interpretation of the *Woodcock–Johnson III Tests of Cognitive Abilities*

Acting on Evidence

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"The process of validation involves accumulating evidence to provide a sound scientific basis for the proposed score interpretations." (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 1999, p. 9)

The *Woodcock–Johnson III Tests of Cognitive Abilities* (WJ III COG) (Woodcock, McGrew, & Mather, 2001) represents the culmination of nearly four decades of systematic psychometric test development by Dr. Richard Woodcock and his colleagues. The WJ III COG was developed to provide reliable and valid measures of a number of important cognitive abilities for individuals ranging from preschool-age children to persons in late adulthood. Its strong theoretical and empirical underpinnings, its adept construction, and

its large and nationally representative standardization and co-norming with the *WJ III Tests of Achievement* (ACH; Woodcock et al., 2001) make the WJ III COG an assessment battery that should receive serious attention by assessment professionals.

The most recent revision of the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999) also represents the culmination of decades of effort to provide guidance and accountability regarding the development and use of psychological and educational tests like the WJ III COG (Kane, 2001). The most recent revision of *Standards* continues to increase the accountability and sophistication demanded of test authors, publishers, and users. *Standards* covers the three broad areas of (a) test construction, evaluation, and documentation; (b) fairness in testing; and (c) testing applications. The first broad area includes evaluation of core psychometric characteristics such as test development and revision, reliability, and validity. In order for assessment professionals to incorporate the WJ III COG into their practice appropriately, they must "know thy instrument" within the context of *Standards*. Of the core psychometric characteristics, validity is "the most fundamental consideration in developing and evaluating tests" (p. 9). It is important to recognize that the validity framework for *Standards* differs in a number of ways from traditional notions of validity held by many professionals in psychology, education, and related fields. Consistent with contemporary conceptualizations of validity (viz., Benson, 1998; Cronbach & Meehl, 1955; Loevinger, 1957; Messick, 1989, 1995; Nunnally & Bernstein, 1994), *Standards* specifies that validity investigations should focus on the *uses and interpretations* of measures and the constructs they are intended to represent. Thus, uses and interpretations of scores from tests and *not the tests themselves* must demonstrate validity. Furthermore, *Standards* conceptualizes validity as a unitary and multidimensional concept (Messick, 1989, 1995). Many assessment professionals may have learned the traditional tripartite model of validity that treated content, construct, and criterion-related validity as relatively separate and equal forms of validity. *Standards* advocates against the notion of distinct types of validity that are either present or absent.

In accordance with *Standards* (AERA, APA, & NCME, 1999), the WJ III COG authors have woven together multiple strands of evidence to construct a network of validity evidence supporting the uses and interpretation of scores from their instrument (McGrew & Woodcock, 2001). This chapter synthesizes the network of validity evidence available for the WJ III COG.[1] Understanding the WJ III COG in the context of *Standards* and how this knowledge bears on its use and interpretation is the focal point of this chapter.

[1]Space limitations require a singular focus on validity. The reader should consult the *WJ III Technical Manual* (McGrew & Woodcock, 2001) in order to evaluate the WJ III COG as per adherence to the other standards (e.g., reliability and scale development).

REVIEW OF WJ III COG VALIDITY EVIDENCE

LITERATURE REVIEW

In order to collect sources contributing to the network of validity evidence for the WJ III COG, three strategies were employed. First, the technical manuals for the three editions of the *Woodcock–Johnson Tests of Cognitive Abilities*[2] were reviewed (McGrew, Werder, & Woodcock, 1991; McGrew & Woodcock, 2001; Woodcock, 1978). Second, an electronic bibliographic search of journal articles, books, and book chapters published between January 1977 and March 2002 was conducted using PsychInfo, PsychFirst, and ERIC. Search terms included "Woodcock," "WJ," and "Tests of Cognitive Ability." Third, the reference sections of sources obtained during the initial stages of the search were reviewed. References that included tests from any of the three editions of the *Woodcock–Johnson Tests of Cognitive Abilities* and that provided direct validity evidence supporting interpretation of its tests and clusters were reviewed. Sources that focused solely on the *Woodcock–Johnson Tests of Achievement* were excluded. Appendix A at the end of this book provides a list of the references included in this review and presents the results of the classification of these references according to the areas of validity evidence they represent and other study characteristics. In order to prevent overinterpretation of scores from single tests of ability (e.g., subtests), and consistent with the recommendation of the WJ III COG authors, the review and synthesis are limited to interpretations of the WJ III COG clusters and composites.

ORGANIZATION OF REVIEW

Rather than presenting a "minitechnical manual" replete with tables upon tables of numbers, a conceptual, "big picture" approach was chosen to display the validity evidence for the WJ III COG. First, validity evidence for the seven Cattell–Horn–Carroll (CHC) factor clusters and the global ability composites (e.g., General Intellectual Ability, Brief Intellectual Ability, and Predicted Achievement) is presented. This evidence is supported by visual-schematic figures that summarize and illustrate the relationships among the different forms of validity evidence (see Figures 1-1 through 1-7 and Figure 1-9). Each figure is intended to synthesize, on one page, the preponderance of validity evidence for selected measures. Each figure contains references to the relevant sources listed in Appendix A. The validity evidence supporting interpretation of the WJ III Cognitive Performance Model clusters and the WJ III clinical clusters is also reviewed in this chapter. Consistent with the focus of this chapter, examples are provided that illustrate how to draw upon this validity evidence during the

[2]The previous name for WJ III COG was "Tests of Cognitive Ability." To increase readability, the most current name, "Tests of Cognitive Abilities," was used in this chapter when referring to all three editions of the battery.

practice of psychoeducational assessment. Finally, the chapter ends with a brief discussion of consequential validity evidence and its application to the WJ III COG.

WJ III COG VALIDITY EVIDENCE

CHC FACTOR CLUSTERS

Figures 1-1 through 1-7 present validity evidence for seven CHC factor clusters. The left side of each figure introduces evidence that focuses on determining if the Theoretical Domain and Measurement Domain have been adequately developed. Evidence supporting the substantive base of test development and the validity of test content is presented in the Theoretical Domain section. Although not included explicitly in *Standards*, recent conceptualizations of validity have focused on the requirement that test development and test interpretation should build upon a conceptual map based on accumulated knowledge about the phenomenon under study (Benson, 1998; Messick, 1989, 1995). Thus, sound theory and research findings should guide item and scale development and should support and enhance users' interpretations. Figures 1-1 through 1-7 present the theoretical framework underlying each cluster. For example, Figure 1-1 indicates that the Short-Term Memory (*Gsm*) CHC factor cluster was designed to represent the respective CHC broad cognitive ability (Carroll, 1993, 1997; Horn, 1991; Horn & Noll, 1997). In order to represent this broad cognitive ability, the *Gsm* cluster includes measurement of two CHC narrow cognitive abilities, Working Memory and Memory Span (Carroll, 1993; Flanagan, McGrew, & Ortiz, 2000). Near the top center of Figures 1-1 through 1-7, the large, darkened ovals represent broad cognitive abilities, and small white ovals within these larger, shaded ovals represent the narrow cognitive abilities likely measured by each test composing the CHC factor clusters. At the bottom of the Theoretical Domain section, there is a summary of validity evidence based on test content and supporting references (corresponding to those in Appendix A). Evidence based on test content reflects whether the items and components of a test represent the construct under study in a complete, accurate, and unbiased manner.

The Measurement Domain section of Figures 1-1 through 1-7 provides (a) evidence of the response processes required by tests that compose the CHC factor clusters and (b) evidence of the internal structure of the battery. The measurement domain represents the complete array of possible measures and procedures that a test author could select to operationally measure constructs in the theoretical domain. Test authors must select from a wide variety of available procedures, item and response formats, and scoring procedures when designing tests that are intended to measure an aspect of the theoretical construct domain.

Research examining response processes focuses on the overt or covert steps that examinees follow to complete test items. For example, the nature of test

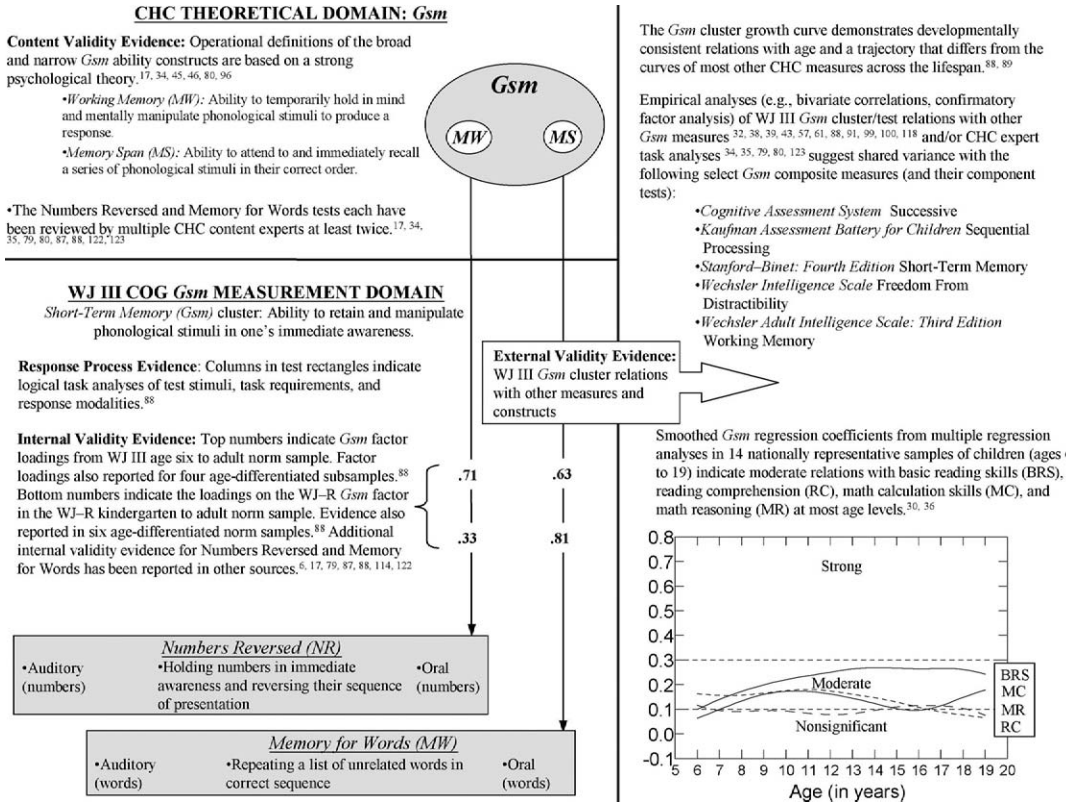

FIGURE 1-1 Summary of validity evidence for the Short-Term Memory (*Gsm*) Cattell–Horn–Carroll (CHC) factor cluster. Superscript numbers refer to sources in Appendix A. By permission of the Institute for Applied Psychometrics, LLC.

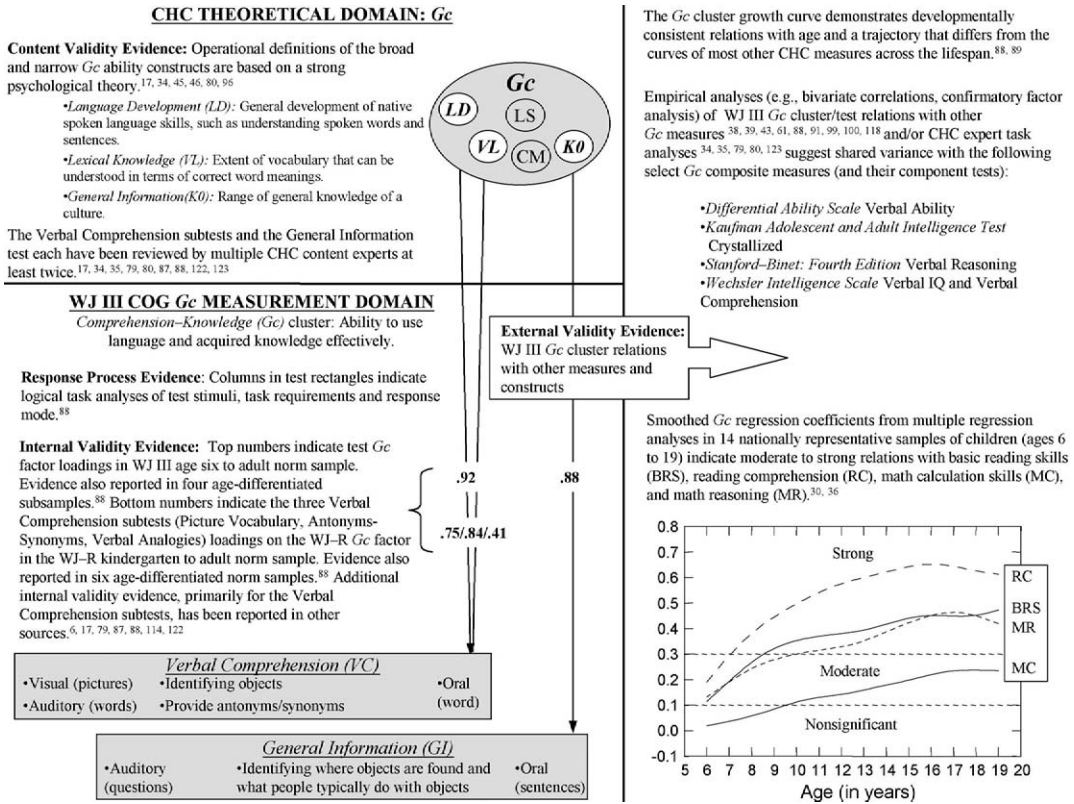

FIGURE 1-2 Summary of validity evidence for the Comprehension–Knowledge (*Gc*) Cattell–Horn–Carroll (CHC) factor cluster. Superscript numbers refer to sources in Appendix A. By permission of the Institute for Applied Psychometrics, LLC.