

# Early Childhood Measurement and Evaluation Tool Review

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## Wechsler Intelligence Scale for Children – Fourth Edition [Canadian] (WISC®–IV)

### Measurement Areas:

The Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV) is designed to test **intelligence** (cognitive ability) in English-speaking children and adolescents ages **6 years 0 months to 16 years 11 months** in five composite areas:

1. Verbal Comprehension
2. Perceptual Reasoning
3. Working Memory
4. Processing Speed
5. Full Scale IQ

### Purpose:

The WISC-IV is a norm-referenced intelligence assessment tool that can be used to:

- measure general cognitive functioning;
- identify intellectual giftedness, cognitive disabilities, and cognitive strengths and weaknesses;
- guide treatment program development;
- inform placement decisions in clinical and educational settings; and
- provide clinical information for neuropsychological evaluation and research.

### Length and Structure:

The WISC-IV is designed to assess individual children and adolescents. The ten core subtests take approximately 65-80 minutes to administer, and an additional 10-15 minutes are required to administer the five supplemental subtests. Several of the subtests have age-based start/finish and reversal rules that allow the examiner to reduce the amount of time spent administering the test.

The tool consists of 10 core subtests (Block Design, Similarities, Digit Span, Picture Concepts, Coding, Vocabulary, Letter-Number Sequencing, Matrix Reasoning, Comprehension, and Symbol Search) and 5 supplemental subtests (Picture Completion, Cancellation, Information, Arithmetic, and Word Reasoning). The number of items in each subtest varies, with a minimum of 10 items and a maximum of 38 items; item score ranges differ for each subtest (e.g., the Similarities subtest is scored 0-2, while the Block Design subtest is scored 0-7). Raw scores are compiled and converted into composite scores, standard scores, process scores, percentile ranks, descriptive classifications, and test-age equivalents.

### **Materials:**

The publisher classifies the WISC-IV as a “Level C” qualification that is targeted to institutions with personnel possessing masters and doctorates of psychology or education, and/or have licensure in a relevant area of assessment with one of the following provincial or national organizations: the Canadian Psychological Association (CPA), the Canadian Register of Health Service Providers in Psychology (CRHSPP), the Canadian Association of School Psychologists (CASP), and the American Psychological Association (APA). The WISC-IV is available in several options: the basic kit is sold by the publisher for CDN \$1760.00, and includes the administration and scoring manual, the technical and interpretive manual, stimulus book, Canadian record forms, response booklets, and assorted subtest templates and manipulatives. Scoring and interpretation software (WISC-IV Scoring Assistant and WISC-IV Writer for Windows) are available for CDN \$335.00 and CDN \$750.00 respectively; these are also available bundled-in with the WISC-IV kit at a discount.

### **Accessibility:**

The WISC-IV is available in the English language (using Canadian and USA norms), and the Spanish language (using USA norms) in separate kits. The administration and scoring manual also contains considerations and alternate testing guidelines for testing children with special needs, or who are deaf or hard of hearing. There is also a French version with Canadian norms for use with Francophone children.

### **Administration, Scoring, and Interpretation:**

The WISC-IV manual suggests that the test examiners and scorers have (at minimum) technical training in test administration. Individuals with formal graduate-level or professional training in psychological assessment should interpret test results using the 10-step method described in the manual. The test is moderately easy to administer, easy to score, and moderately difficult to interpret based on the interpretation guide in the manual, and education and previous experience. The manual contains a supplemental section on interpretation, including exemplar interpretive reports.

### **Subscales:**

The WISC-IV consists of 4 subscales: the Verbal Comprehension Index (VCI), the Perceptual Reasoning Index (PRI), the Working Memory Index (WMI), and the Processing Speed Index (PSI). Each subscale consists of the scores from 3 to 5 of the subtests that are added together and

converted to a subscale score. The scaled scores on each of these subscales are combined to form a composite Full Scale IQ (FSIQ) score.

### **Documentation:**

The WISC-IV Administration and Scoring Manual provides specific procedures for administration and scoring. The Technical and Interpretive Manual has comprehensive chapters on interpretation, test standardization, norm development, validity and reliability. Examples of interpretive reports are included in the manual, and show how the WISC-IV can be used to improve clinical utility when used with other standardized tests.

### **Norming Sample:**

**Note: The following information pertains only to the Canadian edition of the WISC-IV**

The WISC-IV was normed and standardized using a **Canadian** sample of 1,100 children (50% Female, 50% Male) ages 6 years 0 months to 16 years 11 months. The sample was stratified according to demographic variables such as age, sex, race/ethnicity, parent education level, and geographic region. The authors maintain that a close correspondence is kept between the sample's demographics and demographic information based on the 2001 Canadian Census. It should be noted that one Canadian region (the Northwest Territories) was not included in the sample. Approximately 6% of the standardization sample was First Nations which closely matches the 2001 Canadian Census demographic. According to the manual, persons classified as First Nations included Inuit, Métis, and North American Indians. The manual contains a detailed discussion of the sample's demographic information.

### **Reliability:**

**Note: The following information pertains only to the Canadian edition of the WISC-IV**

The WISC-IV manual discusses three kinds of reliability measures:

**Internal Consistency:** A split-half reliability test determined the reliability of scores for two halves of the test using the standardization sample's data. According to the manual, average reliabilities fell between .78 and .88, suggesting that there is a reasonable amount of score consistency. Consistency scores were also compiled for a "special populations" sample (e.g., intellectually gifted, cognitively delayed, etc.) of 102 children and showed that the WISC-IV is equally reliable for those populations.

**Test-retest Reliability:** A separate sample of 108 children was tested with the WISC-IV twice in a 2-6 week interval. The test-retest reliabilities were calculated, and yielded correlations in the .80s and .90s for both subtest scores and composite scores, suggesting good test-retest reliability.

**Standard Error of Measurement and Confidence Intervals:** The manual also discusses the degree to which measurement error should contribute to an individual's observed score. According to the authors, if a child has a FSIQ score of 108, their "true score" should fall between 102 and 113 points at a 95% confidence interval.

## Validity:

### **Note: The following information pertains only to the Canadian edition of the WISC-IV**

An extensive discussion of validity is contained in the WISC-IV technical and interpretive manual. According to the authors, the WISC-IV taps “a broad range of cognitive domains, including verbal reasoning, perceptual reasoning, concept formation, sequential processing, auditory comprehension, cognitive flexibility, working memory, perceptual organization, and psychomotor processing speed.” The technical and interpretive manual contains a chapter that discusses the test’s content rationale at length.

**Construct and Convergent Validity:** The manual discusses an intercorrelation analysis that was performed on the WISC-IV to determine how related each of the subtests were to each other. The authors hypothesized that the subtests would vary in their relations to each other (e.g., subtests in the Verbal Comprehension scale would correlate more strongly with each other than if they were compared with other subtests), and that most of the intercorrelations would support a general intelligence factor *g*. In general, moderate correlations were found between all subtests, and subtests generally correlated in the .50s and .60s with FSIQ. These correlations would suggest that the WISC-IV does measure a single factor related to general cognitive intelligence. The manual includes a single study analyzing the relationships of scores between the WISC-IV and the Wechsler Individual Achievement Test – Second Edition (WIAT-II) based on a Canadian sample. Using a sample of 110 children, the authors compared WISCIV scores to scores on the WIAT-II. In the study, FSIQ scores on the WISC-IV demonstrated a strong relationship (.80) with Total Achievement on the WIAT-II. Other subscale scores were correlated to lesser degrees, suggesting that the WISC-IV measures different constructs than the WIAT-II in several of the subtests.

**Special Populations:** Scoring on the WISC-IV was also examined in small samples of 4 different special populations: 1) children who were identified as being intellectually gifted, 2) children identified as having cognitive delays, 3) children with reading and written expression disorders, and 4) children with attention-deficit/hyperactivity disorders. When scores for the special populations were compared with a control group’s scores, the scores consistently demonstrated most of the expected differences.

It is worth noting that children with learning disorders (such as Reading and Written Expression disorders) performed much poorer on several of the WISC-IV composite scores. It is also notable that children with ADHD did not perform comparably to their American counterparts; the authors suggest that the difference may be due to the relatively small Canadian sample size. Test specificity and sensitivity for these samples are not discussed in the Canadian edition of the WISC-IV manual.

## Publication Information:

This review is based on the 4th edition of the Wechsler Intelligence Scale for Children [Canadian] published in 2004 by Harcourt Assessment.

## References:

Publisher's website: [www.harcourtassessment.ca](http://www.harcourtassessment.ca)

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