

SYMPOSIUM

Exploring the clinical utility of WAIS–III and WMS–III

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INTRODUCTION

While some of the modifications made to produce the WAIS–III and WMS–III (Wechsler, 1997a, 1997b) make sense from a neuropsychological standpoint, there are many questions still unanswered about the validity and reliability of these tests and their ultimate utility to neuropsychologists. The new tests have been criticized for having long administration times, which is problematic given pressures to decrease rather than increase the length and cost of neuropsychological evaluations (Ryan et al., 1998). Clinical neuropsychologists want to know if these tests can help them evaluate their patients more accurately with greater sensitivity and specificity than the alternatives, and experimental neuropsychologists want to know if they can help answer theoretical questions.

The *Technical Manual* for these tests has documented many excellent psychometric characteristics, particularly in terms of a large census-based normative sample that spans a wide range of education and age levels. This property increases the neuropsychologist's ability to more accurately determine if a deficit is attributable to brain damage or to other factors, such as normal variability or demographic factors, which is particularly important when identifying subtle problems. However, even with excellent normative data a test is not useful if it is measuring a skill that is not important because it is infrequently impaired or it does not correlate well with other tests in the same domain. Validity studies are needed to answer these questions.

Some of the modifications of the WAIS–III and WMS–III have attempted to extend these instruments to include conceptual domains that allow neuropsychologists to better describe the cognitive processes that influence patient performance. This has been done by adding several new subtests and constructing indices, which are believed to measure Verbal Comprehension, Perceptual Organization, Working Memory, and Processing Speed. New subtests, Symbol Search, Letter–Number Sequencing, and Matrix Reasoning, have been added to the WAIS–III in order to expand upon the cognitive domains examined and allow for the construction of the indices. The addition of the Processing Speed and Working Memory indices is welcome given data showing the importance of similar measures in a variety of groups including normal aging (Salthouse, 1996), traumatic brain injury (Gronwall & Wrightson, 1974), and multiple sclerosis (Demaree et al., 1999). The Matrix Reasoning

subtest was designed to measure fluid reasoning and reduce the element of timed performance within the Performance IQ and Perceptual Organization Scores (Tulsky et al., in press, *a*; Psychological Corporation, 1997). The WMS–III underwent even more extensive changes. New subtests were added (especially to measure visual memory), recognition measures were added to the already available recall measures to attempt to identify retrieval deficits, and the construct of delayed memory was emphasized. Like the WAIS–III, these changes and the rationale for these changes have been documented in the *WAIS–III–WMS–III Technical Manual* (Psychological Corporation, 1997).

The initial validity studies that were reported in the *Technical Manual* are encouraging (Psychological Corporation, 1997). They show that the normative samples are large, representative of the U.S. population, and help set a standard for data samples for neuropsychological tests. The majority of the analyses are standard: presentation of reliability coefficients, correlations between subtests and between index scores, factor analyses, and correlations with the previous editions of the tests. The psychometric properties that were reported using the normal range standardization sample (Psychological Corporation, 1997) are excellent and, in general, the initial reviews of the WAIS–III (e.g., Kaufman & Lichtenberger, 1999) and the WMS–III (e.g., Larrabee, 1998) published in the literature were positive. While the WAIS–III seems to have been accepted in the field, issues have been cited about the WMS–III especially in regard to the factor structure of the scale and inclusion of the Faces subtest as a measure of Visual Memory (see Millis et al., 1999) and norming issues for the Recognition memory components (Tulsky et al., in press, *b*). Also included in the manual are some studies that report preliminary data in a range of small clinical groups. While studies within specific populations that will be tested are required of tests in the new standards that have been introduced for educational and psychological testing (American Educational Research Association, 1999), the clinical studies in the manual are preliminary and merely serve as a first step toward providing evidence of clinical validity. The *WAIS–III–WMS–III Technical Manual* even states that the clinical samples “are small and results from any one study or group should be considered preliminary rather than conclusive” (p. 116) and that the special studies were “presented as examples and are not intended to be definitive representations of . . . [the] . . . diagnostic groups” that are presented in the manual (p. 144).

Given the extent of the revisions within the tests, a much more detailed exploration of their reliability, construct validity, and clinical utility is clearly warranted. Though initial work by Hawkins (1998) and Heaton et al. (in press) have examined the differential functioning of these scales in clinical groups and across demographic groups, much more work is needed in these areas to convince neuropsychologists that these tests should be incorporated in their evaluations. We need more exploration of what these new subtests and index scores measure and how they vary across patients with different etiologies and locations of brain damage. In addition, the large normative sample distributed across the adult age span is ideal for exploring important theoretical and clinical questions focused upon normal cognitive changes across the age range.

The studies in the symposium in this issue have been designed to start building this body of data. Two studies utilize the clinical groups presented in the *Technical Manual*, one uses the normal standardization sample from the *Technical Manual*, and two studies present data in patients with right or left temporal lobe epilepsy (TLE) and patients with traumatic brain injury (TBI). In keeping with the standards for educational and psychological testing (American Educational Research Association, 1999), the Zhu et al. study shows that the split-half reliability of the WAIS-III subtests is similar or higher than the normal standardization sample in 8 of 10 clinical groups. Another paper examines how the sensitivity and specificity of demographically-corrected indices from the WAIS-III and WMS-III vary with different cut-offs of impairment in six of those clinical groups (Taylor & Heaton). Hawkins and Tulskey assess the influence of ability level on the FSIQ-General Memory Index discrepancy and provide tables of base rates for the published standardization sample. The final two papers present new clinical data on the WMS-III in patients with temporal lobe epilepsy and on the WAIS-III in patients with traumatic brain injury. The epilepsy paper by Wilde et al. is based on a large multicenter study that examines patients with left or right TLE demonstrating that the WMS-III is not very useful in detecting laterality differences presurgically. The TBI paper by Donders et al. examines a large sample of mild and moderate to severe TBI patients to assess if the three new WAIS-III subtests (Letter-Number Sequencing, Symbol Search, Matrix Reasoning) are impaired in TBI. Consistent with the higher incidence of impaired working memory and rapid processing in TBI (Dikmen et al., 1995; Gronwall & Wrightson, 1974), they found that Letter-Number Sequencing and Symbol Search were impaired in the moderate to severe TBI patients relative to the normal standardization sample, while no group differences were present for Matrix Reasoning.

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