Parsimonious Prediction of Wechsler Memory Scale—III Memory Indices

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Equations for prorating the Wechsler Memory Scale—III (WMS-III) Index scores were derived and validated on a sample of 252 mixed clinical cases. Regression equations were performed using age-scaled scores as predictors and the sum of age-scaled scores for Immediate Memory (IM) and General Memory (GM) as the criteria. Including Logical Memory and Verbal Paired Associates with either Faces or Family Pictures resulted in estimated scores that accounted for 95% to 97% of the variance for IM and GM. Over 80% of these cases had estimated sum of scaled scores that fell within 3 points of actual sum of scaled scores, within 1 standard error of measurement. When only Logical Memory and Verbal Paired Associates were included, estimations accounted for only 87% of the variance, and only 60% of the estimated scores fell within 3 points of actual sum of scaled scores. The regression equations are presented, as are the confidence intervals derived from a bootstrapping procedure that created 15,000 different samples.

The Wechsler Memory Scale (WMS) was initially created to be a "rapid, simple, and practical memory examination" (Wechsler, 1945, p. 87) that generated a Memory Quotient (MQ) that was comparable to performance on the Wechsler—Bellevue (Wechsler, 1939). The Wechsler Memory Scale—Revised (WMS—R, Wechsler, 1987), published 42 years later, was viewed as an improvement, particularly with the inclusion of a formal delayed memory component to the test. By 1991 (Butler, Retzlaff, & Vanderploeg, 1991), the WMS and WMS—R were the most often used measures of learning and memory. Of neuropsychologists interviewed, 93% had used one or the other measure.

However, criticisms were leveled against the WMS—R, not the least of which was that clinicians reported that the administration was too lengthy (approximately 45 min) to perform all of the subtests of the WMS—R. In response to this issue, but in attempting to maintain the factors of immediate and delayed memory using the task, we generated equations for prorating the WMS—R General Memory and Delayed Memory scores using a mixed clinical sample (Woodard & Axelrod, 1995). The resulting equations used only the immediate and delayed subtests of Logical Memory, Verbal Paired Associates, and Visual Reproduction in estimating the sum of scaled scores. The estimated sum of scaled scores correlated .985 with actual General and Delayed Memory scores. These findings were confirmed through several independent studies, including a normal sample of young adults and patients with moderate-to-severe closed head injury (Hoffman, Tremont, Scott, Adams, & Mittenberg, 1997), patients with mild traumatic brain injury and seizure disorders (Hoffman, Scott, Tremont, Adams, & Oommen, 1997), patients undergoing independent evaluation after suspected brain injury (Axelrod, Putnam, Woodard, & Adams, 1996), and a mixed clinical sample referred for evaluation at an outpatient clinic (Broek, Golden, Loonstra, Ghingia, & Goldstein, 1998). Not only did the regression analyses generate accurate predictions of the main scores, but less relevant subtests were omitted, and the overall administration time was cut in half.

The Wechsler Memory Scale—Third Edition (WMS—III, Wechsler, 1997c) was developed, in part, to improve on the known difficulties with the WMS—R. As noted in the technical manual (Wechsler, 1997a, pp. 14–17), the WMS—III was improved with regard to standardization and content. The standardization sample included a broader age range without interpolated norms. The newly developed scales demonstrated stronger internal consistency than did the WMS—R scales. Renamed from verbal and nonverbal to auditory and visual, respectively, the distinction between verbally and visually mediated stimuli was maintained. Two new motor-free tasks using visually presented stimuli (Faces and Family Pictures) replaced Visual Reproduction, Visual Paired Associates, and Figural Memory as core subtests.

The major indexes for the WMS—III include Immediate Memory (composed of Logical Memory 1 [LM1], Verbal Paired Associates 1 [VePA1], Faces 1 [F1], and Family Pictures 1 [FP1]), General Memory (composed of Logical Memory 2 [LM2], Verbal Paired Associates 2 [VePA2], Auditory Recognition Delay [AR], Faces 2 [F2], and Family Pictures 2 [FP2]), and Working Memory (composed of Letter—Number Sequecing and Spatial Span).

The authors of the manual stated (Wechsler, 1997a) that the test indexes were generated on theoretical rather than statistical grounds. However, confirmatory factor analysis reported in the manual presented better support for a five-factor model of the WMS—III (i.e., Immediate Auditory, Immediate Visual, Delayed...