

- WECHSLER, D. (1949). *Manual for the Wechsler Intelligence Scale for Children*. New York: Psychological Corporation.
- WECHSLER, D. (1955). *Manual for the Wechsler Adult Intelligence Scale*. New York: Psychological Corporation.
- WECHSLER, D. (1974). *Manual for the Wechsler Intelligence Scale for Children-Revised*. New York: Psychological Corporation.
- WECHSLER, D. (1981). *Wechsler Adult Intelligence Scale-Revised*. New York: Psychological Corporation.
- WHITWORTH, R. (1984, April). *Differences between Anglo- and Mexican-American students classified as learning disabled*. Paper presented at the meeting of the Southwestern Psychological Association, New Orleans.

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## A COMPARISON OF TURKISH AND ANGLO-AMERICAN NORMATIVE DATA ON THE WECHSLER MEMORY SCALE

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This study compared the performance of 200 Turkish adults, divided by educational status and age (20-39; 40-59), with published data based upon similar-aged American and British normative samples. Results highlighted the major influence of educational background in determining performance on the WMS and the implications of this effect in interpreting normative performance.

The assessment of memory forms an important part of the clinical neuropsychological examination. Despite criticisms, the Wechsler Memory Scale (WMS) remains the most widely used clinical test of memory (Lubin, Larsen, & Matarazzo, 1984). The lack of adequate normative data has been one of the most frequently mentioned criticisms of the WMS because the original report and subsequent manual provided subtest norms based upon only two age groups with a total sample size of 96 (Wechsler, 1945). In the course of developing appropriate cognitive assessment procedures for use in psychiatric and neurological settings in Turkey, we conducted a normative study of a Turkish translation of the WMS. The original version has been translated and employed rather than Russell's modification (Russell, 1975), principally so that the literacy status of the subjects does not determine the applicability of the test. (Russell's modification requires the subject to write out what he or she recalls of the two story passages that make up the Logical Memory subtest).

There is considerable heterogeneity in the educational experience of the adult Turkish population, which varies according to the particular age cohort and region of the country. Consequently, we attempted to obtain normative data across the age range, 20 to 59 years, subdivided into four levels of education: These ranged from the unschooled to those with a College/University education. The present paper reports a comparison of the performance of 200 subjects from this normative study with published data from Wechsler's original sample (Wechsler, 1945), together with subsequent published studies by Hulicka (1966) and Kear-Colwell and Heller (1978).

## METHOD

*Subjects*

Two hundred subjects, drawn from a variety of urban and rural areas in the provinces of Ankara and Izmir, were administered a Turkish translation of Form 1 of the WMS. Sixty were in their twenties, 60 in their thirties, 42 in their forties, and 38 in their fifties. Within each of the four age groups, subjects were selected to represent four broad educational levels, namely those who had not completed a primary school education, those who had graduated from elementary school, those who had completed either junior high school or high school, and those who had completed a university education.

*Procedure*

The translated version was essentially comparable with Form 1, with some minor modifications to the Information subtest and the replacement of the second passage of Form 1 Logical Memory story with the first passage from Form 11. Each subject was tested individually, either at home or at work, by clinical psychologists or graduate students in the administration of the scale. Verbatim recording of the responses of all subjects enabled interrater reliability studies to be carried out on both the Logical Memory and Visual Reproduction subtests.

## RESULTS

A subsample of 30 subjects, drawn at random from the total sample, had their performance on Logical Memory and Visual Reproduction scored by three independent raters. The results indicated interrater reliability coefficients for the total scores to range from +.95 to +.98 (Visual Reproduction) and +.93 to +.97 (Logical Memory). These results compare well with similar American studies of interrater reliability. (Cf. Schear, 1986.)

Scores of the WMS subtests and total raw score were analyzed within the Turkish sample according to two age groups (20 to 39 years and 40 to 59 years), subdivided into two educational status groups (those with either elementary or no formal schooling and those with secondary and tertiary education). The mean values for these four groups are presented in Table 1.

Two-way analyses of variance were performed on the scores to test for the significance of age and educational status differences. The results of these analyses in-

Table 1  
*Performance on the Wechsler Memory Scale by Age and Educational Status*

	Age: 20 to 39 years		Age: 40 to 59 years	
	Nil or elementary	Secondary or above	Nil or elementary	Secondary or above
Information	4.96 (1.22)	5.83 (.38)	4.68 (1.58)	6.00 (.00)
Orientation	4.62 (.62)	5.00 (.00)	4.25 (.96)	4.89 (.31)
Mental Control	3.17 (2.45)	5.87 (2.38)	2.61 (2.41)	6.03 (1.95)
Logical Memory	4.74 (2.21)	9.88 (4.01)	4.27 (2.85)	10.00 (3.14)
Digit Span	7.35 (1.46)	10.21 (2.36)	6.86 (1.48)	10.21 (1.69)
Visual Reproduction	6.25 (3.20)	10.49 (3.06)	4.14 (3.50)	10.10 (2.64)
Paired Associates	11.22 (3.16)	15.49 (3.05)	9.42 (4.15)	14.00 (.00)
Raw Score Total	42.29 (9.60)	62.70 (10.90)	36.20 (13.72)	60.92 (7.11)



icated that educational status had a highly significant ( $p < .001$ ) effect on the scores of all subtests and total raw score, while significant ( $p < .05/.01$ ) effects of age status were confined to the scores on Visual Reproduction and Paired Associate as well as total raw score. There were no significant interactions, an indication that educational status differences did not vary by age.

In order to compare our results with existing normative data, we examined the total raw score for our young-adult and middle-aged samples with comparable data drawn from Wechsler, Hulicka, and Kear-Colwell and Heller's samples. The relative comparisons are shown in Table 2.

Table 2  
*WMS Raw Score Total: Comparison of Turkish Samples of Selected Anglo-American Normative Data*

Sample	<i>N</i>	<i>M</i>	<i>SD</i>
Turkish 20- to 39-year-olds, limited education	72	42.29	9.60
Turkish 20- to 39-year-olds, secondary/tertiary education	47	62.71	10.90
Wechsler (1945) norms, 20- to 29-year-olds	50	68.10	6.47
Hulicka (1966) norms, 30- to 39-year-olds	53	61.89	8.71
Kear-Colwell and Heller's (1978) norms, 20- to 35-year-olds	56	71.33	7.78
Turkish 40- to 59-year-olds, limited education	59	36.20	13.72
Turkish 40- to 59-year-olds, secondary/tertiary education	21	60.92	7.22
Wechsler's (1945) norms, 40- to 49-year-olds	46	57.78	7.12
Kear-Colwell and Heller's (1978) norms, 36- to 60-year-olds	60	62.67	9.84

The mean raw score totals of the two Turkish samples who had completed either secondary or tertiary education fall within the mean values of existing English and American samples (who would probably be of similar educational status). In contrast, the mean values of the two Turkish samples with limited education fall outside the range of existing average levels of performance; they were between two and four standard deviations below Anglo-American norms.

#### DISCUSSION

The present normative study of a Turkish translation of the WMS has shown the importance of educational status in determining individual differences in adults' performance on the various subtests and total score. Turkey, in common with other industrialized countries, shows marked heterogeneity in educational status among its adult population when compared with Western industrialized countries. It is clear that the need for a set of national norms arises principally because of the presence of a significant number of adults in the population with limited education. If the population were restricted to those with educational backgrounds comparable to those of their counterparts in Western countries, it would be reasonable to employ American or British norms to evaluate memory performance in Turkish clinical settings. When one is examining patients whose educational background is not comparable, it is clear that separate normative data are required.

Even within educationally more homogeneous populations, variations in the length and extent of schooling that reflect historical cohort, regional, and ethnic variations in educational access and uptake still may play a significant role in determining per-

formance on a test like the WMS. This has already been noted, for example, by Bak and Greene (1981) in their review of the performance of elderly Americans on the WMS. But the main point of the present paper is to emphasize that because of different sociodemographic conditions between industrialized and industrializing countries, age variation has been accorded major significance in cognitive test performance interpretation for the non-Western world. It will be necessary to consider correction factors for education rather than for age in evaluating WMS performance in Turkish adult samples.

#### REFERENCES

- BAK, J. S., & GREENE, R. L. (1981). A review of the performance of aged adults on various Wechsler Memory Scale subtests. *Journal of Clinical Psychology, 37*, 186-188.
- HULICKA, I. M. (1966). Age differences in Wechsler Memory Scale scores. *Journal of Genetic Psychology, 109*, 135-145.
- KEAR-COLWELL, J. J., & HELLER, M. (1978). A normative study of the Wechsler Memory Scale. *Journal of Clinical Psychology, 34*, 437-442.
- LUBIN, B., LARSEN, R. M., & MATARAZZO, J. D. (1984). Patterns of psychological test usage in the United States: 1935-1982. *American Psychologist, 39*, 451-454.
- RUSSELL, E. W. (1975). A multiple scoring method for the assessment of complex memory functions. *Journal of Consulting and Clinical Psychology, 43*, 800-809.
- SCHEAR, J. M. (1986). Utility of half credit scoring of Russell's revision of the Wechsler Memory Scale. *Journal of Clinical Psychology, 42*, 783-786.
- WECHSLER, D. (1945). A standardized memory scale for clinical use. *Journal of Psychology, 19*, 87-95.

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### ELECTROENCEPHALOGRAPHY (EEG) IN THE DIFFERENTIAL DIAGNOSIS OF DEMENTIA

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Recent technical advances in neurodiagnostic procedures have improved significantly our knowledge of the pathophysiology of a number of disease processes and how they relate to behavioral manifestation. This paper focuses on advances in electroencephalography (EEG) and the implications that this growing body of research has for the diagnosis of suspected brain disorders in older patients.

Accurate assessment of suspected brain-related disorders in older persons is one of the greatest challenges to clinical practitioners. Differentiation among psychological, infectious, toxic, vascular, or atrophical etiologies can be a diagnostic dilemma. Because many causes of brain disorders are treatable and/or reversible (Task Force Sponsored by the National Institute on Aging, 1980), accurate classification becomes vitally important. The correct identification of the underlying disorder can have direct therapeutic implications for a large percentage of patients with previously unclassified dementia (Seltzer & Sherwin, 1978).

While a number of different disorders can be responsible for a dementing illness, senile dementia of the Alzheimer's type (SDAT) and multi-infarct dementia (MID) ap-

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