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A Factor Analytic Study of the Metropolitan Readiness Test

CECIL R. REYNOLDS
University of Nebraska at Lincoln

The responses of 322 beginning first graders to the six subtests of the Metropolitan Readiness Test were factor analyzed. A single General Readiness factor appeared to best describe the instrument. Implications for use of the Metropolitan Readiness Test are briefly discussed.

Although the Metropolitan Readiness Test (MRT) (Hildreth, Griffiths, & McGauvran, 1969) is probably the most widely employed of all school readiness tests, little is known about the factor structure of the battery. The MRT consists of six subtests: Word Meaning, Listening, Matching, Letter Naming, Numbers, and Copying. Previous factor analyses of the MRT have suffered from the limitations of small samples or confounding due to the inclusion of several other tests in the factor analytic solution (e.g., Goolsby & Frary, 1970; Leton, 1963; Telegdy, 1974). When other tests have been included, the MRT tends to split into two factors, a reading readiness or language factor and a visual-motor factor. The present study investigates the factor structure of the MRT factored alone and attempts to determine whether interpretations of other than the total score are appropriate.

METHOD

Subjects

The sample consisted of 322 kindergarten children (90 white females, 86 white males, 73 black females, 73 black males) having a mean age of 6 years 2 months, $SD = 3.74$ months. None of the groups differed in mean age from any other group. When the five category system of socioeconomic status (SES) classification used by Wechsler (1974) and McCarthy (1972) was applied, the following SES breakdown occurred: Upper class $N = 48$, Upper-middle class $N = 58$, Middle class $N = 56$, Lower-middle class $N = 142$, and Lower class $N = 18$. Each race/sex group was represented within each SES category, though whites showed a higher SES rating than blacks, $\chi^2(12) = 93.07$, $p < .001$. The mean score for the total sample on each MRT subtest approached the 50th percentile of the national norm group. Performance on each MRT subtest ranked in the following manner: WF > WM > BF > BM, the difference in each case being significant ($p \leq .05$).

The sample was drawn from a single school district located in a small metropolitan area of the southeastern United States. All children attended public or private kindergarten during the year preceding the administration of the MRT. No special education or previously identified handicapped children were included in the final sample of 322.

Requests for reprints should be addressed to Cecil R. Reynolds, Department of Educational Psychology, 130 Bancroft Hall, University of Nebraska at Lincoln, Lincoln, NE 68588.

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Procedure

During the first 2 weeks of first grade, all children were administered the MRT by their regular classroom teacher. Raw scores from each of the six subtests were then submitted to principal factoring with iterations, with R^2 in the diagonal, and rotated to two- and three-factor Varimax solutions with factor plots also being obtained.

RESULTS AND DISCUSSION

Results of neither the two- nor three-factor Varimax solution provided a clear-cut answer. The two-factor Varimax solution produced the results shown in Table 1 (eigenvalues are taken from the unrotated principal-factor matrix). In the two-factor solution, the second factor has a relatively small eigenvalue and subsequently accounts for a small proportion of the variance. In addition, several subtests load substantially on more than one factor and the factor plot was not definitive. Results of the three-factor solution were even more unsatisfactory.

As with the two-factor solution, small eigenvalues occurred following the first factor (as expected) and several subtests loaded at relatively high levels on more than one factor. Visual inspection of the factor plots suggested a single factor best describes the *MRT*, a conclusion supported by the large communalities and strong first factor observed in both solutions. However, prior to making a decision, a more objective method of determining whether a single score best describes performance on the MRT was employed.

According to Silverstein (1973), the work of Kaiser (1968) indicates that most algebraic, psychometric, and psychological criteria for extracting factors are met by retaining only factors with eigenvalues greater than one following principal-components analysis with unities in the diagonal of the correlation matrix. When applied to present data on the MRT, the principal-components analysis with unities in the diagonal produced a single factor with an eigenvalue exceeding one. The eigenvalue of the second factor was only .79 with an even sharper reduction following the

TABLE 1
TWO-FACTOR VARIMAX SOLUTION

Subtest	Factor 1	Factor 2	Communality
Word Meaning	.27	.76	.68
Listening	.31	.54	.39
Matching	.62	.46	.60
Letter Naming	.73	.27	.61
Numbers	.72	.47	.74
Copying	.77	.30	.68
Eigenvalue	3.31	0.37	
% Variance	90	10	

TABLE 2
FACTOR LOADINGS FOR THE SINGLE-FACTOR PRINCIPAL COMPONENTS SOLUTION

Subtest	Factor loadings
Word Meaning	.71
Listening	.66
Matching	.82
Letter Naming	.79
Numbers	.88
Copying	.82
Eigenvalue	3.68
% Variance	61.3

second factor. Factor loadings for the single factor principal components solution are shown in Table 2.

From the analyses presented here, it seems clear that the MRT has a single factor (General Readiness) accounting for the vast majority of reliable variance available. When these data are considered in conjunction with the relatively low individual subtest reliabilities and subsequently small subtest specific variance terms (i.e., specific variance *not* exceeding error variance), it appears that only the use and interpretation of the MRT total test score is appropriate. The MRT total score is a quite good predictor of early school achievement, concurrently (Telegdy, 1975) and over a 9-month period (Reynolds, 1978).

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