

## Brief Report

# The Reliability of Oltman's Rod-and-Frame Test With Grade-School Children

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The Portable Rod-and-Frame Test (PRFT) was developed by Oltman (1968) to measure field dependence-independence in a lighted room. Oltman suggested that the lighted room would be more appropriate for use with children than measures that require a darkened room. Reliability data on the use of the PRFT with school children are scant. Dreyer, Dreyer, and Neblekopf (1971) reported a test-retest reliability (one-month interval between testings) on 46 kindergarten children as .96. It appears that there are no other reliability data on the Oltman PRFT when used with school children (Cox & Witkin, 1978). The purpose of this study was to assess reliability of the PRFT with school-age children and to examine grade and sex differences.

### Subjects and Procedure

Ten boys and ten girls each from Grades 1, 3, and 5 of a middle-income northern school were tested on Oltman's PRFT apparatus ( $N = 60$ ). Mean ages (standard deviation) of children for the respective grades were 82.75 (4.12), 104.15 (3.98), and 128.60 (4.55) months. Children were tested on an eight-trial sequence which consisted of (1) frame tilt 28 degrees left, rod tilt 28 degrees left; (2) frame 28 degrees left, rod 28 degrees right; (3) frame 28 degrees right, rod 28 degrees right; and (4) frame 28 degrees right, rod 28 degrees left; then Trials 1-4 were repeated. On each trial the experimenter turned the rod in small, discrete increments until the child indicated that the rod was in an upright (vertical) position. The experimenter then recorded the number of degrees off true vertical, which represents the quantification of the observation. A total score for a subject was the sum of the degrees off true vertical for all trials.

### Results and Discussion

Total scores ranged from 9 degrees to 224 degrees. A  $3 \times 2$  (Grade  $\times$  Sex) analysis of variance computed on total PRFT scores revealed a significant main effect for sex ( $F(1, 54) = 5.68; p < .05$ ). The means were 109.6 for males and 139.1 for females. Although the mean scores decreased with grade level from 142.8 to 122.8 to 107.5, the effect for grade was not statistically significant, ( $F(2, 54) = 2.47; p < .10$ ). The Grade  $\times$  Sex interaction was not significant. The performance of the present sample of children was thus comparable to the findings of others (using a different instrument and different conditions) in terms of sex and grade-level differences (Rusch & Lis, 1977).

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Two measures were employed to estimate reliability—Cronbach's alpha and a split-half using each set of four trials as a "half." Coefficient alphas for the first, third, and fifth grades, respectively, were estimated at .96, .96, and .97. The split-half reliabilities adjusted by the Spearman-Brown prophecy formula were estimated at .91, .90, and .91. The latter set of reliabilities is slightly lower than those obtained by Oltman (1968) with adults, but generally higher than those reported by Rusch and Lis (1977) on a somewhat different instrument. The combination of the analysis of variance and reliability findings suggest that Oltman's PRFT is a reliable and useful measure of field dependence-independence in grade-school children.

### References

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