
BRIEF REPORTS

Internal Consistency and Concurrent Validity of Two Short Forms of the Visual Form Discrimination Test

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The purpose of this study was to evaluate the reliability and concurrent validity of 2 short forms of the Visual Form Discrimination Test, referred to as first half (FH) and front-back (FB). Participants were a mixed sample of 225 patients seen for neuropsychological evaluations. The mean difference score between both short forms and the full form was less than 1 point. The short-total correlations were .85 and .86 for the FH and FB forms, respectively. A binary clinical decision rule, used to classify patients as normal or impaired, resulted in a 93.3% correct and a 94.7% correct classification rate for the FH and FB forms, respectively. It is concluded that the short form of the test, used in conjunction with a clinical decision rule, results in a very minor loss of accuracy.

Key words: Visual Form Discrimination Test, visual perceptual, dementia, short form

It may seem unnecessary to shorten the Visual Form Discrimination Test (VFDT; Benton, Hamsher, Varney, & Spreen, 1983). The test usually takes less than 5 min in persons with no impairment, and it almost always takes less than 10 min, regardless of level of impairment. Moreover, by shortening the test, its reliability may be adversely affected. We contend, however, that many clinicians and researchers may wish to find

ways to reduce their assessment (or screening) time for visual-perceptual functioning and would benefit from information regarding what costs to their clinical conclusions would result from shortening the VFDT. In general, the use of brief screening measures is helpful when patients with cognitive impairment cannot tolerate extensive evaluations because of fatigue, attentional problems, or low frustration tolerance, or when screening for research participation.

Iverson, Sherman, and Smith-Seemiller (1997) evaluated a short form of Benton's VFDT for use in evaluations for dementia and concluded that the short-form scores are very similar to the full-form scores. This

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same short form yielded very similar scores to the full form in a sample of patients with closed head injuries (Iverson, Slick, & Smith-Seemiller, 1997). In these studies, the short form of the VFDT was derived by summing the responses from eight items and multiplying the result by 2. Items 1 through 4 and 13 through 16 were selected because the correct choice was presented an equal number of times in each of the quadrants, a method employed by Benton and colleagues (Benton, Hamsher, Varney, & Spreen, 1983; Benton, Sivan, Hamsher, Varney, & Spreen, 1994) in the standard form. We refer to this short form as the front-back (FB) method.

Although the positive conclusions of the two previous studies using the FB method were convincing, there was an inherent bias in the methodology. Namely, the short form tested is not exactly equivalent to the short form used, because Items 5 through 12 were given between the front and back quarters of the test. Furthermore, the previous tests of the FB method were carried out on relatively small, homogeneous samples.

The purposes of this study were twofold: (a) to determine if the clinician can give the first half of the test (i.e., the first 8 items) and obtain a reliable and valid score—we refer to this method as the first-half (FH) method; and (b) to compare the FB method to the FH short-form method. Given the homogeneity of the items and patients' apparent consistency in responding, it was hypothesized that the short-form scores would be highly similar to the scores derived from the full version of the test.

Method

Participants

Participants were 225 persons with heterogeneous neurological and psychiatric diagnoses who were referred for neuropsychological evaluation. The sample contains all of the patients with presumed dementia ($n = 39$) and closed head injuries ($n = 62$) who were reported in previous studies (Iverson, Sherman, & Smith-Seemiller, 1997; Iverson, Slick, & Smith-Seemiller, 1997). The mean age for the group was 48.3 years ($SD = 18.5$), and the mean education was 11.9 years ($SD = 2.4$). No patient was involved in litigation at the time of assessment. This sample represents a diverse group of inpatients participating in a rehabilitation program and outpatients referred for neuropsychological evaluation.

Procedure

Patients were administered the VFDT as part of their neuropsychological evaluation. The VFDT is composed of 16 target items with multiple-choice response arrays. The participant is required to choose the geometric design that matches the target design from among four designs presented on a single page (three of which are foils). Participants receive 2 points for a correct response and 1 point if they choose the foil that contains a minor peripheral error. A total score of 32 is possible on the test. The total short-form scores were derived by summing the responses from eight items and multiplying the result by 2.

Results and Discussion

As expected, reducing the number of items of the VFDT resulted in lower internal consistency coefficients. The internal consistency (Cronbach's alpha) of the full form of the test was .75, and the internal consistencies of the FH and FB short forms were .62 and .63, respectively.

The patients obtained an average score of 25.6 ($SD = 5.6$) on the standard form of the VFDT, 26.4 ($SD = 5.3$) on the FH, and 26.3 ($SD = 5.4$) on the FB. Although there was a significant difference between the mean scores of the FH and FB short forms and of the full form, the effect sizes were very small, $t(224) = 4.1, p < .001, \eta = .07$, and $t(224) = 3.8, p < .001, \eta = .06$, respectively. The correlations between the short forms and the total score were .85 and .86 for the FH and the FB, respectively. The frequency distributions of the absolute differences between the short forms and standard form are presented in Table 1. For both the FH and the FB, the majority of short-form scores were within 2 points of the standard VFDT scores (i.e., 70.7% and 71.6%, respectively).

Cutoff scores on the VFDT generally are presented as follows: (a) a score of 25 was exceeded by 95% of the original normative sample (Benton et al., 1994) and is therefore considered to be a cutoff score, (b) scores of 24 or 25 are considered to be borderline to mildly impaired, (c) a score of 23 is considered moderately impaired, and (d) a score of 22 or less is considered severely impaired. We used these cutoffs to assess performance on the short forms of the test, using the classification that would have resulted from using the full form as a comparison measure. Many of the patients scored below the cutoff. Applying a cutoff score of 25 or less to the FH and FB methods, 28 and 30 partici-

Table 1. Frequency Distribution of the Absolute Differences Between the Standard and Short Form Visual Form Discrimination Test Scores

Absolute Difference From Total Score	First Half		Front-Back	
	<i>f</i>	Cumulative %	<i>f</i>	Cumulative %
0	53	23.6	44	19.6
1	58	49.3	68	49.8
2	48	70.7	49	71.6
3	19	79.1	18	79.6
4	26	90.7	34	94.7
5	11	95.6	1	95.1
6	5	97.8	6	97.8
> 6	5	100.0	5	100.0

Note: *N* = 225.

pants (12.4% and 13.3%), respectively, were falsely labeled as unimpaired (i.e., false negatives), and 7 and 4 patients (3.1% and 1.8%), respectively, were misclassified as impaired (i.e., false positives).

Clinical decision rules can be used to improve the overall accuracy of a screening test. The decision rule used in the two previous VFDT short-form studies was applied to this sample: “If the short form score is within 1 point of the borderline impairment classification range (i.e., score of 23–26), then the entire test should be administered” (Iverson, Slick, & Smith-Seemiller, 1997, p. 127). Using this decision rule and comparing to the full form, 93.3% and 94.7% of the sample was classified correctly as either impaired or normal by the FH and FB methods, respectively. For the FH short form, the decision rule resulted in 0.9% false positives and 5.8% false negatives. For the FB short form, the decision rule resulted in 0.0% false positives and 5.3% false negatives.

For this study, expansion of the decision rule to “if the short form score falls on or between 22 and 28, then the entire test should be administered” resulted in nearly perfect classification accuracy (99.1%) for both short forms. Moreover, for both short forms, all false positives were eliminated, and the occurrence of false negatives was reduced to 0.9%. However, use of this “expanded” decision rule would result in approximately 50% of this sample being administered the full version of the test, whereas only about 25% of the sample would be administered the full version of the test with the narrower criterion.

In summary, the two short forms of the VFDT have good concurrent validity for both clinical and research applications. However, the FH short form may be more appropriate for use at this time, because no research has been conducted on the FB short form without adminis-

tering the middle eight items. Therefore, the reliability and validity findings for the FH short form may be more accurate. In this study, when the FH short form was used with a heterogeneous group of patients and the aforementioned “expanded” clinical decision rule was applied, no patients were classified as having a perceptual problem when their total scores would have fallen in the normal range, and 0.9% were classified as not having a perceptual problem when their total scores would have fallen in the impaired range.

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