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Note on Comparability of Microcog Test Forms

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This study investigated the differences between the Standard and Short forms of MicroCog by comparing Domain scores for a clinical sample of 351 substance abusers which gave a significant difference between scores on

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the Spatial Processing Domain. Implications for research and clinical use are discussed.

MicroCog: Assessment of Cognitive Functioning (5) was designed to measure the cognitive functioning of adults via unsupervised computerized administration. Standard and Short forms were normed on 810 healthy adults, 18 to 89 years of age and representative of 1988 census data. Standard Form (18 subtests) and Short Form (12 subtests) administrations yield five ability-based Domain Scores, i.e., Attention/Mental Control, Memory, Reasoning/Calculation, Spatial Processing, and Reaction Time (Level I Indexes) and summary scores (Level 2 and Level 3 Indexes) which are based on subtest performance.

MicroCog developers offer little information regarding Standard Form versus Short Form use. The Standard Form typically requires 1 hr. to administer, whereas the Short Form requires *30* min. Given few psychometric data for the Short Form of MicroCog, the Standard Form is preferred, and the alternative Short Form should be used when a global assessment of functioning is needed and time or examinee's characteristics do not allow full administration

Clinical application of the two forms was investigated within a larger study (3) of integrated aspects of their validity. Analysis showed five mean Domain Scores on the Standard Form of chronic substance abusers (n = 228) were significantly lower than those for the normative sample (M = 100, SD = 15). For the 123 examinees four of the five Domain Scores on the Short Form were lower than expected values; the Short Form Spatial Processing Domain Score (M= 95.76, SD = 14.56) did not differ significantly from the norm. Conversely, the Standard Form spatial score was approximately 21 points below the norm (M = 78.72, SD = 17.36).

The Standard Form Spatial Processing Domain is comprised of both the Clocks subtest (which presents seven analog clock faces and requires the examinee to choose the correct time setting from a set of printed, numbered multiple response choices displayed for each clock) and the Tic Tac (I and II) subtest (which presents a 3 x 3 block matrix of three to five colored squares which the participants recreate in a specified pattern using the number keypad to locate). The Short Form Spatial Processing Domain Score reflects only performance on the seemingly less complex Clocks subtest. Qualitative review of the

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Standard and Short Form Spatial Processing sub- tests suggests that the versions may be mediated by distinct cognitive processes.

The findings of the larger study and the quantitative review of content generated general questions about the comparability of the two forms, specifically, whether the Standard Form and Short Form Spatial Processing Indexes assess the Spatial Processing comparably or one form underestimates or overestimates. The present purpose was to assess the comparability of the two forms in a clinical sample of substance abusers.

Method

Participants (224 men, 4 women) completed the Standard Form and 123 (122 men, 1 woman) the Short Form. Of the 228 participants, 160 were Euro-American, 62 were African American, 2 were Native American, and 4 did not identify ethnic origin. Of the 123, 62 were Euro-American, 50 were African American, ***3*** were Hispanic, and 8 did not identify ethnic back- ground. The mean age of the former group was 45.3 yr. (*SD* = 9.1) and mean education 12.5 yr. (*SD* = 1.8). Of the latter group mean age was 45.6 yr. (*SD* = 9.1) and mean education 12.1 yr. (*SD* = 1.5). *All* met criteria for substance dependence.

MicroCog was administered to all within three days of admission to the substance abuse treatment unit at a midwestern Veterans Administration Medical Center. The administration of the Standard Form or the Short Form was based on time limitations associated with the number of patients admit- ted on a given day.

To investigate the comparability of the two forms and specifically of the Standard Form and Short Form Spatial Processing Domains, the five Do- main Scores on the two versions were compared using *t* tests with Bonferroni correction for *p* .05 studywide.

Results and Discussion

Differences between mean scores on the Spatial index of the two forms were significant (t_{349} = -4.76, p = .005) but not on the Attention/Mental Control, Memory, Reasoning/Calculation, Reaction Time Indexes.

Inspection of the two Spatial Processing subtests suggests that inclusion of the Tic Tac subtest on the Standard version but not on the abbreviated version, may account for the difference in scores for

groups. Specifically, the Tic Tac subtest may be more cognitively demanding and more discriminating a measure of spatial processing. The Short Form version includes only one subtest, Clocks, which does not require information storage, manipulation, and retrieval processes. The data in the MicroCog manual (5) supports this hypothesis as the Tic Tac Total Score and the Clock Total Score correlate 32 and .13 with the Visual Memory Index of the Wechsler Memory Scale-Revised (7), respectively. Use of the Short Form may overestimate a person's actual spatial processing, an issue particularly relevant to the assessment of substance abusers as research has shown individuals who engage in chronic substance abuse typically have deficits in visual aspects of memory (1, 2, 6).

Given comparability in age, education, and abuse history of the samples, a lack of comparability on the test forms, specific to the assessment of the Spatial Processing Index is suggested by this analysis. Samples were not comparable by ethnic breakdown, however, and related research (4) indicated ethnicity accounted for less than 1% and 4% of the score variance on the Spatial Processing Index of the Standard Form and Short Form, respectively. When descriptive data for the largest subsets of the sample were closely inspected, the 160 Euro-Americans who completed the Standard Form and the 60 who completed the Short Form had, respectively, mean scores on the Spatial Processing Index of 79.9 (SD = 17.2) and 99.0 (SD = 11.4). Similarly, performance across the forms varied for African-American participants (M = 75.1, SD = 17.8 on the Standard Form, M = 92.8, SD = 16.7 on the Short Form). Years of education were comparable across these sub- sets. Test selection for a clinical sample of substance abusers should be in-formed by this finding. Research on comparability of these test forms is warranted.

Notes

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Appendix

Table 1: Descriptive Statistics for MicroCog Performance Indexes

MicroCog Index	Standard Form (n = 228)		Short Form (n = 123)	
	M	*SD*	*M*	*SD*
Attention	85.32	15.35	78.00	18.45
Memory	84.22	16.14	81.82	16.05
Reasoning (n = 227)	82.47	16.84	82.20	17.26
Reaction	86.89	18.79	80.83	21.89
Spatial	78.72*	17.36	95.76*	14.45

*p = .05

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