The Rey-Osterrieth Complex Figure Test as a Neuropsychological Measure in Criminal Offenders

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What does the Rey-Osterrieth Complex Figure Test (CFT) measure in criminal offenders? This study examined neuropsychological and personality test correlates of performance on the Complex Figure Test in a sample of 110 incarcerated criminal offenders. Three standard CFT scores—copy accuracy, memory recall accuracy, and organizational quality—did not discriminate between violent and nonviolent offenders, and were not correlated with either Psychopathy Checklist scores or self-reported anger using the Novaco Anger Scales. CFT performance was significantly correlated with two other standard neuropsychological measures, a short form of the Category Test and the Trail Making Test. As might be expected, CFT scores were positively correlated with WAIS-R Block Design, and to a lesser extent Vocabulary. Organizational quality scores were significantly correlated with the Barratt Impulsiveness Scale. Approximately 27 to 36% of the variance in CFT scores could be explained by the combination of minority status, measures of nonverbal cognitive performance, and self-reported impulsivity. © 1997 National Academy of Neuropsychology

The Rey-Osterrieth Complex Figure Test (CFT) is a neuropsychological test used to assess perceptual organization, planning, and figural memory (Hamby, Wilkins, & Barry, 1993; Lezak, 1995). Studies have reported on the test’s ability to discriminate between brain-damaged and normal adults (Binder, 1982; King, 1981; Visser, 1973) and between ADHD and normal boys (Grodinsky, 1990). Although the neuropsychological functioning of criminal offenders, particularly violent offenders, is of considerable interest (Adams, Melroy, & Moritz, 1988; Kolb & Whishaw, 1990; Langevin, Ben-Aron, Wortzman, & Dickey, 1987; Mungas, 1988; Spellacy, 1978), we could not identify studies investigating the CFT in this population. The purpose of this study was to investigate the concurrent validity of the CFT among criminal offenders through examining the relations between the CFT and other standard neuropsychological and personality measures.

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Several studies suggested that poor neuropsychological test performance is associated with violent behavior (Spellacy, 1977, 1978; Yeudall, 1977). Some researchers have investigated the importance of seizure-like activity in the temporal lobe or limbic system in regards to violent behavior but the exact mechanism and interaction with other variables remains controversial (Mungas, 1988). Mungas (1988) found no significant difference in neuropsychological performance between violent and nonviolent psychiatric patients.

Other researchers have contended that psychopathic criminal offenders exhibit cognitive deficits similar to patients with frontal lobe damage, such as difficulties with fluctuating attention, inflexibility, abstraction, and perseveration (Gorenstein, 1982; Gorenstein & Newman, 1980; Schalling, 1978). However, Hare (1984) found no link between psychopathy and neuropsychological test performance. Moreover, Sutker and Allain (1987) found that psychopaths showed no greater deficits than normal controls in neuropsychological areas such as abstraction, flexibility, control, or planning.

There is evidence that criminal offenders manifest impairment on other drawing tests. Bhargava and Sahni (1989) found that criminals showed more distortions than noncriminals in their perceptual organization ability on the Bender-Gestalt. Moreover, the criminals scored higher on the sub-categories of the Bender-Gestalt reflecting anxiety, stress, and cortical dysfunction (Bhargava & Sahni, 1989).

### NEUROPSYCHOLOGICAL DEFICITS AND CRIMINAL BEHAVIOR

Neuropsychological studies of criminal offenders have identified performance deficits, but have not given sufficient attention to the functional characteristics or underlying mechanisms by which neuropsychological impairment would increase the risk of criminal behavior. At least three hypotheses can be considered. First, neuropsychological impairment may cause a decrement in abstract reasoning and problem-solving ability (Gorenstein, 1982). Second, neuropsychological impairment may decrease ability to regulate attention and control impulses (Schalling, 1978). Finally, impairment may be associated with decreased ability to tolerate frustration or contain feelings of anger (Schalling, 1978). These hypothetical mechanisms are not mutually exclusive and may interact with one another, but involve three distinguishable psychological constructs—abstract reasoning, impulsivity, and anger control—often used in characterizing criminal offenders.

Studies of CFT performance typically have considered the subject’s accuracy in copying the figure as well as accuracy in drawing the figure from memory (Duley et al., 1993; Lezak, 1995; Osterrieth, 1944). Accuracy scores involve a straightforward tabulation of the number of missing or grossly distorted components of the figure. In addition to copy and memory accuracy scores, other studies have considered the sequence followed by the subject in drawing each component (Bennett-Levy, 1984; Binder, 1982; Grossman et al., 1993; Klicpera, 1983; Waber & Holmes, 1985). The component drawing sequence reveals the participant’s strategy in reproducing the drawing. More efficient strategies, such as drawing larger, basic components of the drawing before drawing minor details, reflect greater
organizational quality. Hamby and colleagues (1993) found organizational quality to have significant but moderate correlations with other measures of performance on the CFT, suggesting that organizational ability may influence, but is nevertheless distinguishable from, reproduction accuracy (Hamby et al., 1993). Organizational quality discriminated between symptomatic and asymptomatic HIV+ patients when copy accuracy and recall accuracy scores did not (Hamby et al., 1993).

We administered the CFT to a sample of adult male criminal offenders to address three questions: (1) Can the CFT distinguish between violent and nonviolent offenders? (2) Is CFT performance correlated with psychopathy? (3) To what extent is CFT performance associated with abstract reasoning ability, impulsivity, or proneness to anger?

**METHOD**

**Participants**

The participants consisted of 110 male inmates residing in Staunton Correctional Center, a medium security state prison in Virginia. Participants were recruited for the study by a letter inviting their voluntary participation. State regulations prohibit compensating research participants. In order to reduce sample heterogeneity on potential confounding variables affecting drawing performance, the study excluded participants who were over the age of 55, mentally retarded, or acutely psychotic. Participants were incarcerated for a wide variety of violent or nonviolent offenses, but not sex offenses. The primary offenses for each subject were: homicide (27), felonious assault (15), robbery (8), larceny or burglary (21), forgery or fraud (9), drug offense (14), parole violation (6), or some other offense (10). The participants had an average of 12 criminal convictions ($SD = 11$, range 0 to 57). The average length of incarceration at the time of the study was 3.4 years ($SD = 3.7$, range 0 to 17). The average participant age was 33 years ($SD = 8$, range 20 to 53). Fifty-four participants were caucasian and 56 were African American. Two caucasians and two African Americans were of Hispanic descent.

**Materials**

*Rey-Osterrieth Complex Figure Test.* The CFT requires the participant to copy a single complex design. As the participant draws the design, the examiner gives the participant a different colored pencil to use each time a major portion of the design is completed, in order to identify the participant’s drawing sequence for scoring purposes (Lezak, 1995). Drawing accuracy was scored using the criteria of Duley et al. (1993), which clarifies the original system used by Osterrieth (1944). In this study, 2 raters independently scored 20 protocols and obtained intraclass correlations (Shrout & Fleiss, 1979) of .82 for copy and .96 for recall trials.

Hamby et al. (1993) developed a scoring system for organizational quality and reported interrater reliability (kappa) of .876. Hamby and colleagues’ (1993) organizational quality score was significantly correlated with CFT copy accuracy, $r (61) = .31, p < .05$ and recall accuracy, $r (61) = .42, p < .001$. In the present study, two raters independently scored 20 participants for organizational quality and obtained an intraclass correlation coefficient of .96.

*Group classification.* Participants were classified as violent or nonviolent offenders on the basis of a detailed review of their criminal records, including their complete institution record and presentence report. Nonviolent offenders were defined as participants with no convic-
tions for violent offenses and no indication of assaultive behavior in their history. While it is recognized that some participants may have committed unrecorded acts of violence, these criteria should have identified a relatively less violent group. This procedure identified 65 violent and 36 nonviolent participants (9 could not be clearly classified due to ambiguous information in their records).

Psychopathy. This study used the revised Psychopathy Checklist (PCL-R), a 20-item checklist, which generates two factor scores and a total score ranging from 0 to 40 (Hare, 1991). Factor 1 is a measure of self-centered and exploitive use of others, and Factor 2 measures an irresponsible and antisocial lifestyle (Hare, 1991). There is substantial evidence supporting the use of the PCL-R to identify psychopathic offenders (Hare, 1991). Hart, Kropp, and Hare (1988) found that high psychopathy scores predicted recidivism even after controlling for criminal history and demographic variables. Similar results have been reported in other studies (Serin, Peters, & Barbee, 1990; Serin, 1991). Harris, Rice, and Cormier (1991) found that psychopathy predicted violent behavior with 78% accuracy and relative improvement over chance of 62%.

This study obtained psychopathy scores from a review of institution records rather than a direct clinical interview, a procedure supported by previous studies (Williamson, Hare, & Wong, 1987; Wong, 1988) and the test manual (Hare, 1991). After reliability training, two raters independently rated 20 participants and obtained intraclass correlations of .74 for Factor 1, .95 for Factor 2, and .94 for PCL-R total scores.

Estimated intelligence. Participants were administered two subtests from the WAIS-R. We selected Vocabulary and Block Design as the most reliable and valid subtest measures of intelligence from the WAIS-R Verbal and Performance sections, respectively (Sattler, 1990). The combination of Vocabulary and Block Design scores has been found to correlate .91 with the WAIS-R Full Scale IQ (Kaufman, 1990). For purposes of this study, however, we correlated each subtest separately with performance on the CFT, reasoning that Block Design would be more highly correlated with CFT scores than would Vocabulary.

Category test. The Category Test is a measure of non-verbal abstract reasoning and problem-solving ability. We used a short form, booklet version of the Category Test (Wetzel & Boll, 1987), which reduces the original 208 items to 100 items. Several studies support the use of the short form because it is less time-consuming and also less frustrating for lower functioning participants (Lezak, 1995; Wetzel & Boll, 1987). Wetzel and Boll (1987) summarized several studies indicating that the 100-item form has psychometric properties similar to the 208-item form. Split-half reliability for the short form was .81, and the total score correlated .80 to .93 with the long form. The short-form was able to discriminate brain-damaged subjects from non-brain-damaged subjects with 83% accuracy.

Trail Making Test. The Trail Making Test (Army Individual Test, 1944; Reitan, 1955) is a timed paper and pencil test of perceptual motor tracking that requires conceptual flexibility. Part A and Part B are two connect-the-dots type tasks. In Part A, the participant must connect a series of numbers arranged in a standard, random order. In Part B, the individual must connect a series of numbers and letters, alternating from number to letter (i.e., 1-A-2-B, etc.), so that the subject must attend to more than one principle in carrying out the task. Deficits on Part B are used as an index of impairment in concentration, cognitive flexibility, and planning (Lezak, 1995; Reitan & Wolfson, 1985).

Anger. This study used the Novaco Anger Scale (NAS; Novaco, 1990), a 74-item
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self-report questionnaire. Part A of the NAS measures the cognitive, affective, and behavioral facets of anger the participant experiences when aroused. Part B provides an index of anger intensity and generality across a range of provocations, such as being criticized, contradicted, or treated unfairly by others (Novaco, 1994). Novaco (1994) reported internal consistency of .95 for Part A, .95 for Part B, and .97 for Total scores. Concurrent validity studies (Novaco, 1994) found that the NAS Total score correlated .82 with the Buss-Durkee Hostility Inventory, .84 with the Spielberger Trait Anger Scale, and .68 with the Cook-Medley Hostility Scale. In studies of psychiatric patients, the NAS was significantly correlated with measures of aggression obtained from hospital records and staff ratings, and with the number of convictions for violent crimes (Novaco, 1994). In the present study, the internal consistency (Cronbach’s alpha) was .95 for Part A, .94 for Part B, and .96 for Total scores.

Impulsivity. The present study used the Barratt Impulsiveness Scale (BIS) to assess the participants’ impulsivity. Impulsivity as measured by the BIS has correlated significantly with performance deficits on psychomotor tasks and psychophysiological measures of impulsivity, and has discriminated aggressive and nonaggressive individuals in a correctional sample (Barratt, 1994; Barratt & Patton, 1983). This study used the newly revised 30-item version of the BIS (Barratt, 1994). Internal consistency (Cronbach’s alpha) was .81 for BIS Total scores.

Procedure

Participants were administered the NAS and BIS in small groups of 5–12 participants. Researchers played an audio tape of the questionnaire during the test session and were continuously available to assist participants in completing the questionnaire. The questionnaire contained 4 validity items to detect random or inappropriate item completion (e.g., “I am telling the truth on this questionnaire,” answered False). Two participants were dropped from the study sample because of inappropriate responses on the questionnaire.

The questionnaire also contained 10 items comprising a short social desirability scale, using items from the Marlow-Crowne scale as recommended by Greenwald and Satow (1970). The social desirability scale had an internal consistency of .70 in this sample. Saunders (1992) reported successful use of a similar social desirability scale in a study of wife-battering husbands.

Participants were administered Vocabulary, Block Design, Category Test, Trail Making Test, and the CFT in a standard order in an individual testing session, followed by a brief clinical interview.

RESULTS

Using the Duley et al. (1993) system for scoring the CFT, the average copy score was 28.99 (SD = 4.29) and the average recall score was 15.76 (SD = 6.70). These two scores were significantly correlated, r (106) = .50, p < .01. Both the copy and recall scores were significantly correlated (p < .01) with organizational quality, r (106) = .42 and .52, respectively. Using the Hamby system for scoring organizational quality, the mean score was 1.8 (SD = 4.4).

To address the effects of potentially confounding variables, preliminary analyses examined the effects of age and race. Analyses indicated that copy, recall, and organizational quality scores were not significantly correlated with age but were correlated with minority status (dichotomously scored as nonminority/minority). Minority status was significantly correlated with CFT copy scores, r (106) = .27, p < .01; recall scores, .36, p < .01, and organizational quality, .23, p < .05.
TABLE 1
Correlations and Partial Correlations between Complex Figure Drawing Test scores and Criterion Measures

<table>
<thead>
<tr>
<th>Criterion Measures</th>
<th>Copy</th>
<th>Recall</th>
<th>Quality</th>
<th>Copy</th>
<th>Recall</th>
<th>Quality</th>
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<tr>
<td>Psychopathy Checklist Total</td>
<td>.03</td>
<td>.11</td>
<td>.09</td>
<td>.09</td>
<td>.10</td>
<td>.05</td>
</tr>
<tr>
<td>Factor 1</td>
<td>.01</td>
<td>.13</td>
<td>.07</td>
<td>.05</td>
<td>.12</td>
<td>.06</td>
</tr>
<tr>
<td>Factor 2</td>
<td>.01</td>
<td>.11</td>
<td>.08</td>
<td>.07</td>
<td>.11</td>
<td>.05</td>
</tr>
<tr>
<td>Novaco Anger Scales</td>
<td>.10</td>
<td>.12</td>
<td>.13</td>
<td>.06</td>
<td>.09</td>
<td>.04</td>
</tr>
<tr>
<td>Part A</td>
<td>.11</td>
<td>.16</td>
<td>.14</td>
<td>.04</td>
<td>.12</td>
<td>.05</td>
</tr>
<tr>
<td>Part B</td>
<td>.10</td>
<td>.12</td>
<td>.13</td>
<td>.06</td>
<td>.09</td>
<td>.04</td>
</tr>
<tr>
<td>Barratt Impulsiveness Scale</td>
<td>.13</td>
<td>.17</td>
<td>.26**</td>
<td>.02</td>
<td>.16</td>
<td>.23*</td>
</tr>
<tr>
<td>Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.28**</td>
<td>.17</td>
<td>.11</td>
<td>.19*</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td>Block Design</td>
<td>.50**</td>
<td>.49**</td>
<td>.44**</td>
<td>.43**</td>
<td>.42**</td>
<td></td>
</tr>
<tr>
<td>Neuropsychological Tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category Test (errors)</td>
<td>.42**</td>
<td>.25**</td>
<td>.25**</td>
<td>.42**</td>
<td>.22*</td>
<td>.25*</td>
</tr>
<tr>
<td>Trail Making A (time)</td>
<td>.06</td>
<td>.21*</td>
<td>.22*</td>
<td>.07</td>
<td>.22*</td>
<td>.23**</td>
</tr>
<tr>
<td>Trail Making B (time)</td>
<td>.25**</td>
<td>.31**</td>
<td>.27**</td>
<td>.19*</td>
<td>.25**</td>
<td>.24**</td>
</tr>
<tr>
<td>Social Desirability Scale</td>
<td>.14</td>
<td>.00</td>
<td>.11</td>
<td>.09</td>
<td>.06</td>
<td>.06</td>
</tr>
</tbody>
</table>

*a All partial correlations control for minority status (minority/non-minority). Partial correlations for Anger and Impulsivity measures also control for social desirability.
*p < .05.
**p < .01.

The difference between violent and nonviolent offenders in CFT copy scores (violent $M = 30.21$, $SD = 3.79$; nonviolent $M = 27.90$, $SD = 4.53$), was not significant, $t(99) = .94$. Similarly, there was not a significant difference in CFT recall scores (violent $M = 16.64$, $SD = 6.10$; nonviolent $M = 14.85$, $SD = 6.74$), $t(99) = 1.32$; or in organizational quality scores (violent $M = 1.86$, $SD = 1.31$; nonviolent $M = 1.80$, $SD = 1.15$), $t(99) = .24$. After controlling for the potential confounding effects of minority status by analysis of covariance, the difference between violent and nonviolent participants was still not significant.

Neuropsychological and Personality Correlates of CFT Scores

The three CFT scores (copy, recall, and organizational quality) were correlated with each of the other study measures, as reported in Table 1. None of the CFT scores were significantly correlated with the Psychopathy Checklist or the Novaco Anger Scales. The CFT copy scores were significantly correlated with Vocabulary, Block Design, Category Test, and Trail Making B. CFT recall scores were significantly correlated with Block Design, Category Test, and both Trail Making A and B. Finally, CFT organizational quality scores were significantly correlated with the Barratt Impulsiveness Scale, Block Design, Category Test, and Trail Making A and B. The magnitude of the statistically significant correlations ranged from .22 to .50. All significant correlations remained significant after controlling for minority status.¹

Using the Hamby system for organizational quality, 68 (62%) of study participants received the lowest possible score (level one). Given the apparent floor effect in our distribution of scores, we decided to modify the scoring criteria in an attempt to discriminate among lower scoring participants. We modified the Hamby et al. (1993) system by expanding the scale from five to seven levels. First, we added two points to each original score, so that

¹ We also examined the correlations between the three CFT scores and each of the neuropsychological test scores after controlling for age and education (highest grade completed) in addition to minority status. This resulted in only one change in the pattern of eight statistically significant results reported in Table 1: the correlation between CFT copy scores and Trail Making B dropped to .15 and was no longer significant.
Hamby et al. (1993) level one scores were now level three, level two scores were now level four, and so on. Next, we rescored the drawings of the lowest scoring participants, using the same 18 scoring elements (drawing order, connection of line segments, etc.) used to determine levels in the Hamby et al. system. Participants with more than 15 errors were assigned to the new level one. Participants with 10 to 15 errors were assigned to level two, and the remaining participants remained at level three. As a result, the 68 participants originally classified as level one were redistributed to level one (6 cases), level two (38 cases) and level three (24 cases). The CFT modified organizational quality scores ranged from 1 to 7 with a mean of 3.39 (SD = 1.60). We repeated the correlational analyses of Table 1 using this modified organizational quality score. There was little change in the magnitude of the resulting correlations and no change in the pattern of significant results.

The correlational findings indicated that CFT performance was associated with measures of impulsivity, non-verbal intelligence, and other neuropsychological tests. In order to gain insight into the total and relative contributions of these measures to the variance in CFT scores, we conducted a multiple regression analysis (see Table 2) predicting each CFT score. Each regression analysis entered minority status and social desirability as a block in step one, then Block Design, Categories, Trails A and Trails B as a block in step two, and finally the Barratt Impulsiveness Scale at step three.

The regression equation predicting the copy scores was significant, $F(7, 100) = 8.32, p < .01$, and explained approximately 37% of the variance. The regression equation for recall scores again was significant, $F(7, 99) = 7.35, p < .01$, and predicted 34% of the variance. Finally, the regression for organizational quality also was significant, $F(7, 101) = 5.52, p < .01$, and explained approximately 28% of the variance.

**DISCUSSION**

This study identified a series of correlates of the Rey-Osterrieth Complex Figure Test in a sample of criminal offenders. CFT performance was significantly correlated with two standard neuropsychological measures, Category Test and Trail Making Test. Performance on these tests has been demonstrated to discriminate patients with neuropsychological impairment from normal controls (Kolb & Whishaw, 1990; Lezak, 1995; Reitan & Wolfson, 1985). Both the Category Test and Part B of the Trail Making Test require conceptual flexibility and capacity to shift to a new frame of reference (Lezak, 1995; Reitan & Wolfson, 1985).

CFT performance was correlated significantly with performance on two intelligence subtests, Vocabulary and Block Design. As might be expected, the pattern of correlations was stronger and more consistent with Block Design than Vocabulary, reflecting the clear emphasis on nonverbal abilities in the CFT task. Notably, Block Design produced the largest correlations (.44 to .50) with CFT of any study measure and accounted for approximately 19% to 25% of the variance in CFT performance. A comparison of the two tasks may shed light on the critical cognitive skills required by the CFT. Both tasks require visual analysis of an abstract design and both tasks require the participant to construct a copy of the design, although the CFT design is more complex and requires the subject to draw the design rather than assemble blocks to match it. Block Design is a timed task and scoring places emphasis on rapid performance, while CFT scoring does not consider speed of performance. Notably, the magnitude of the Block Design correlations with copy and recall versions of the CFT were nearly identical, despite the fact that recall performance should have a sizable memory component.

The organizational quality of CFT drawings was correlated with self-reported impulsivity. More impulsive participants may not have taken the time to analyze the drawing and sort out major from minor elements of the drawing. Their drawings were less likely to follow a well-organized plan. Based on the item content of the BIS, participants with poor organizational quality on the CFT were more likely to describe themselves as someone who acts...
**TABLE 2**  
Multiple Regression Analyses of the Rey-Osterrieth Complex Figure Test (CFT)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Copy Accuracy</th>
<th>Recall Accuracy</th>
<th>Organizational Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B (SE B)</td>
<td>Beta</td>
<td>R² Change</td>
</tr>
<tr>
<td>1</td>
<td>Minority status</td>
<td>.85 (.75)</td>
<td>.10</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Block design</td>
<td>.17 (.04)</td>
<td>.38</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>Categories</td>
<td>.08 (.03)</td>
<td>.27</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Trails A</td>
<td>.05 (.02)</td>
<td>.19</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Trails B</td>
<td>.01 (.01)</td>
<td>.05</td>
<td>.01</td>
</tr>
<tr>
<td>2</td>
<td>Impulsivity</td>
<td>.01 (.02)</td>
<td>.05</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. For copy accuracy, cumulative total $R^2 = .36$, $F = 9.67, p < .01$. For recall accuracy, cumulative total $R^2 = .32$, $F = 7.85, p < .01$. For organizational quality, cumulative total $R^2 = .27$, $F = 6.41, p < .01$.  
*p < .05. **p < .01.
without thinking, makes quick cognitive decisions, and has a lack of concern about the future (Barratt, 1983). Impulsivity did not appear to have an effect on the accuracy of the copy drawing or on the number of elements of the drawing that the participant could draw from memory.

Overall, the criminal offenders in this study performed quite poorly in organizational quality on the CFT, raising the possibility that this test may be unusually sensitive to deficits in this population. It is noteworthy that performance on CFT was not correlated with PCL-R scores, which is consistent with Hare’s (1984) contention that psychopaths do not exhibit neuropsychological deficits, particularly signs indicative of frontal lobe impairment. Similarly, CFT performance was not significantly correlated with self-reported anger, including subscales for anger control and tendencies to become angry in various provocative situations.

We used regression analyses to assess the cumulative impact of minority status, cognitive ability, and impulsivity on CFT performance. These measures accounted for a moderate amount of the variance in CFT scores—36% for copy, 32% for recall, and 27% for organizational quality. Clearly there is a large amount of unaccounted variance to be determined, but the pattern of findings is consistent with claims that the CFT is a neuropsychological test tapping non-verbal, abstract, visual-spatial and organizational skills. Impulsivity also plays a role in the organizational quality of CFT performance. Overall, these findings provide some support for the construct validity of the CFT.

In addition, the results of this study are inconsistent with the contention that either criminal violence or psychopathy are associated with neuropsychological impairment. Given the frequent concern in forensic clinical practice that subgroups violent or psychopathic offenders might have significant neurological impairment, negative findings like the ones reported in this study are noteworthy. Nevertheless, in light of the poor performance of these participants on the CFT, especially in organizational quality, there is reason for further investigation of the meaning of CFT performance in criminal offenders.

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