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Psychometric Properties of the Coolidge Correctional Inventory in a Sample of 3,962 Prison Inmates

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The present study reports on the preliminary psychometric characteristics of a new personality and neuropsychological, 250-item, self-report measure, the Coolidge Correctional Inventory (CCI), in an archival de-identified sample of 3,962 prison inmates. The median internal reliability for the 33 CCI scales and subscales was $\alpha = .79$ (range: $\alpha = .49$ to .93). A prevalence estimate, based on the polythetic criteria in *DSM-IV-TR*, of at least one personality disorder was 61% of the entire sample, and the prevalence of ADHD was estimated to be 16%. Drug and alcohol problems were also highly prevalent (60%). These results appear to support the preliminary reliability and validity of the CCI and also reveal a high rate of psychopathology and neuropsychological dysfunction among prison inmates. Copyright © 2009 John Wiley & Sons, Ltd.

Mental illness among prison inmates is an issue of growing importance for the criminal justice system. At year end 2003, the total number of prisoners under the jurisdiction of federal or state adult correctional authorities was 1,470,045 (Harrison & Beck, 2004), and according to the Bureau of Justice Statistics approximately 16% of this population suffer from a mental illness (Ditton, 1999). In a meta-study of 62 surveys of 23,000 prison inmates world-wide, psychotic disorders were reported in about 4% of the inmates, personality disorders in 65%, and major depression in 10% (Fazel & Danesh, 2002). Teplin, Abram, McClelland, Dulcan, and Mericle (2002) found that approximately 66% of young male inmates reached the diagnostic threshold for at least one psychiatric disorder and approximately 17% met the criteria for attention-deficit hyperactivity disorder. Although the prison system is not designed to house mentally ill offenders, the number of inmates with mental

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disorders such as schizophrenia, bipolar disorder, major depression, and various personality disorders is steadily increasing (Human Rights Watch, 2003).

Due to restricted budgets and deficits in mental health resources within most prisons, the psychological screening and assessment of inmates has become increasingly important for the allocation of the resources and treatment that are available. The purpose of this article is (a) to report on the preliminary psychometric properties of a new psychological inventory designed for prison inmates, the Coolidge Correctional Inventory (CCI; Coolidge, 2004), (b) to estimate rates of mental illness in this population, and (c) to determine whether there are differences in prevalence rates based on gender, age, and violent crime status of the inmates.

SCREENING AND ASSESSMENT

Clinical screening and assessment of offenders upon entering the criminal justice system can aid in the placement and treatment of mentally ill offenders. Screening of inmates for mental disorders typically takes place at a reception/diagnostic center, and approximately 70% of prisons screen inmates at intake and 65% conduct psychiatric assessments (Beck & Maruschak, 2001). Once the evaluations are completed on the offenders, the resultant information is most commonly used to identify risk and inform security level placement decisions (e.g., maximum, medium, minimum security). The psychological assessments and screening for mental disorders have also been used to ascertain inmates' specific need for mental health services (Megargee & Bohn, 1977), predict future violence or institutional violations (Gacono, 2000; Fraboni, Cooper, Reed, & Salstone, 1990; Kelln, Dozois, & McKenzie, 1998; Megargee, Mercer, & Carbonell, 1999), and predict recidivism in parole (Borzecki, Wormith, & Black, 1988).

The thousands of inmates processed each year by each state's reception center requires the process of screening and assessment to be effective (i.e., capable of identifying inmates suffering from mental illness) while not being cumbersome, excessively time-consuming, costly, or a significant interference in custody operations (Maloney, Ward, & Jackson, 2003). The American Psychiatric Association identifies a three-step process, where the first step involves universal screening (e.g., intelligence tests, self-report personality measures, and alcohol and drug dependence screening). The second step in this process involves a more in-depth mental health assessment for those people identified at the initial screening as having a sufficiently high probability of suffering a serious mental illness (i.e., high scores on the personality measures or alcohol and drug screening). The final step, if deemed necessary, is a full-scale psychological examination (Maloney et al., 2003).

The screening and assessment process within correctional settings has historically been enhanced by the use of various versions of two popular self-report psychological inventories, the Minnesota Multiphasic Personality Inventory (MMPI; Butcher et al., 2001) and the Millon Clinical Multiaxial Inventory (MCMI; Millon, 1987; Millon, Davis, & Millon, 1997). These inventories have scales that can identify individuals who may be at risk for suicidal behavior (e.g., depression and anxiety scales; Cooper & Berwick, 2001; Gray et al., 2003), are vulnerable targets for other inmates (e.g., dependent personality disorder and schizophrenia scales; Ahlmeyer,

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Kleinsasser, Stoner, & Retzlaff, 2003), may become predators themselves (e.g., antisocial personality disorder and sadistic personality disorder scales; Chantry & Craig, 1994; Gray et al., 2003; Megargee et al., 1999), substance abuse (e.g., drug abuse and antisocial personality disorder scales; Grabarek, Bourke, & Van Hasselt, 2002; Megargee et al., 1999), and psychotic outbreaks (e.g., delusional disorder, mania, and schizophrenia scales; Retzlaff, Stoner, & Kleinsasser, 2002). Although adult attention-deficit hyperactivity disorder and various other aspects of neuropsychological dysfunction (e.g., memory disorders, symptoms of closed head injury) may often exacerbate the psychological profile of inmates and may have negative effects upon psychological treatment and other services, these conditions are not directly assessed by either current versions of the MMPI-2 or MCMI-III.

The MMPI has a long history of use because, although longer than the MCMI (567 items versus 175), it is hand scorable, is generally more cost-effective, and has been in existence for over six decades. Despite these factors, the MMPI-2's major deficiencies are its length, lack of neuropsychological assessment items, and its lack of alignment with the current psychiatric classification system, the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; American Psychiatric Association, 2000). The MCMI was derived from Millon's bioevolutionary theory and model of relational styles on the development of personality styles and personality disorders (Millon, 1987), and his latest version (MCMI-III) is more closely aligned with the *DSM-IV* than previous versions (Choca, 2004). However, the MCMI was designed to differentiate among personality disorders and other psychopathological syndromes and not to distinguish between those who have psychopathology and those who do not. Millon also created anchor base rates (BRs) for the scales that are representative of actual clinical prevalence rates of particular attributes in various psychiatric populations (Jankowski, 2002). As a consequence, BRs make it difficult to estimate prevalence rates of personality disorders, and they make the scores obtained by nonpsychiatric examinees difficult to interpret (Choca, 2004). Like the MMPI-2, the MCMI-III was not designed to assess neuropsychological dysfunction.

COOLIDGE CORRECTIONAL INVENTORY

The CCI was adapted from the Coolidge Axis II Inventory (CATI; Coolidge & Merwin, 1992) specifically for use in prison populations. It was created, in part, to address some of the deficiencies of the MMPI-2 and MCMI-III. Specifically, it was designed (a) to be a cost-effective measure of both psychological and neuropsychological symptoms and syndromes, (b) to be a *DSM-IV-TR* aligned measure, providing coverage for all of the diagnostic criteria for all the personality disorders on Axis II and its appendix, and all the criteria for selected Axis I syndromes, and (c) to allow the differentiation of those inmates who have clinically diagnosable syndromes from those who do not. The present study examines the psychometric characteristics, the primarily internal scale reliabilities and the construct validity, of the CCI in a large sample of prison inmates. Also investigated were the influences of crimes of violence, age, and gender effects upon the psychological and neuropsychological scales. Finally, prevalence rates of psychopathology among inmates were estimated using the CCI scales.

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METHOD

Participants and Procedures

The initial group of participants was 4,872 inmates admitted to the Colorado Department of Corrections (CDOC) over a period of approximately nine months. All inmates were evaluated at the diagnostic and reception center in Denver, CO. The CCI is administered routinely to all inmates upon entrance to the reception and diagnostic center. All data were collected archivally and de-identified from the departmental database maintained by the CDOC. Each inmate, in an approximately two hour testing period, completes approximately four intake tests including the CCI. All tests were administered in groups of 20–45 inmates. The study met the American Psychological Association's standards for ethical research and the standards of the Institutional Review Board of the University of Colorado at Colorado Springs, and had the approval of the CDOC.

Measure

Coolidge Correctional Inventory

The CCI (Coolidge, 2004) is a 250-item, self-report measure, with each item answered on a four-point Likert-type scale ranging from 1 (*strongly false*) to 4 (*strongly true*). There are two validity scales, one a three-item scale measuring random responding (in which it is highly unlikely there would be any answer other than *strongly false*, e.g., ''I played quarterback for the Denver Broncos.'', and a 97-item denial–malingering scale (in which excessively low scores are indicative of denial and excessively high scores are indicative of malingering). In the present study, the following CCI scales were analyzed: 14 personality disorder scales (12 from *DSM-IV-TR* and 2 from *DSM-III-R*), five *DSM-IV-TR* Axis I clinical scales (generalized anxiety disorder, major depressive disorder, posttraumatic stress disorder, ADHD, and schizophrenia and its psychotic thinking subscale), three neuropsychological syndrome scales measuring general neuropsychological dysfunction (with three subscales assessing memory and attention problems, language dysfunction, and neurosomatic symptoms), executive function deficits of the frontal lobes (with three subscales measuring decision-making difficulties, poor planning, and a failure to complete tasks), and mild neurocognitive disorder from the appendix of *DSM-IV-TR*. Also analyzed were three hostility scales of the CCI, measuring anger, dangerousness, and impulsiveness, an overall maladjustment scale, and two critical items assessing drug and alcohol abuse.

The original normative data for the present CCI sample consisted of a sample of convenience ($N = 718$) of purportedly normal, unincarcerated adults (M age $= 30.3$ years old, SD $= 15.2$ years; age range from 16 to 83 years old). There were 358 males and 358 females. Approximately 76% were White, 4% were Black, 7% were Hispanic, 3% were Asian, and 10% were in a mixed ethnicity category. Approximately 65% were single or divorced at the time of test administration, 25% were married, and 10% were in an ''other'' category. The preliminary internal scale reliabilities for the CCI were good with a median $\alpha = .75$ (range: $\alpha = .58$ to .85),

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and factor analyses supported the expected conceptual structures (Babé, unpublished master's thesis). The original CATI, upon which the CCI is based, has excellent test–retest (median) reliability (.90) across its scales (Coolidge & Merwin, 1992). According to the CCI manual (Coolidge, 2004), a *T* score of 70 or above on any scale is considered to be clinically significant (i.e., the disorder in question is highly likely to be present).

Screening Procedure

Based upon previous research with the MCMI in prison populations (Retzlaff et al., 2002), the present 4,872 CCI inmate profiles were screened for random responding, excessive denial, and an excessive number of omitted items. Overall, 13% (657 protocols) were eliminated from further analysis due to random responding. According to the CCI manual (Coolidge, 2004), a score below 120 (greater than 1.8 SD below the normative CATI mean) on the denial–malingering scale is indicative of excessive denying and may be eliminated from analyses. Also, a score on this scale greater than 299 may be indicative of malingering (in a previous CATI study (Coolidge et al., 2000) of 30 long-term inpatients with schizophrenia, 29 had scores less than 300 on the denial–malingering scale). These cutoff scores resulted in the elimination of an additional 4% (202) of the inmates' protocols. Finally, 1% (51) of the protocols were dropped from the present study due to failure to answer at least 235 of the 250 CCI items (again according to the CCI manual). Thus, a total of 19% of the original sample (910) were eliminated from the final statistical analyses, resulting in a remaining sample of 3,962 valid inmate protocols.

Final Sample Demographics

The mean age of the participants was 33.6 years (SD = 9.5), with a range from 17 to 73 years. Approximately 87% of the sample were male ($n = 3{,}439$) and 13% were female ($n = 523$). Ethnic backgrounds of the participants were 31% White, 11% Black, 20% Hispanic, 1% American Indian, 1% Asian, and 36% of mixed or unknown ethnicity. Approximately 64% of the sample had at least a high school diploma or high school equivalency (GED). Approximately 72% of the inmates were incarcerated for the first time (in Colorado), and about 9% were incarcerated for the third time or more. Approximately 34% were incarcerated for a crime of violence.

RESULTS

Internal Scale Reliabilities

The internal scale reliabilities (Cronbach's alpha) for the 33 scales and subscales are presented in Table 1. The median scale reliability for the 14 personality disorder scales was .78, the median scale reliability for the five Axis I scales was .88, and the median scale reliability for all 33 scales and subscales was .79.

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Table 1. Internal scale reliabilities, number of items and raw sum means (SDs) for the CCI scales and subscales are summarized

Axis II Personality disorder scales	Cronbach's α	Number of items	Raw sum mean (SD)
Antisocial	.86	45	85.79 (15.05)
Avoidant	.81	18	37.42 (7.54)
Borderline	.80	23	46.21 (8.39)
Dependent	.83	27	51.97 (9.36)
Depressive	.85	7	12.25 (4.09)
Histrionic	.69	30	68.67 (7.83)
Narcissistic	.74	26	54.65 (7.98)
Obsessive–compulsive	.75	30	61.11 (8.52)
Paranoid	.78	20	43.58 (7.39)
Passive–aggressive	.78	23	47.87 (7.64)
Sadistic	.78	17	27.57 (6.26)
Schizoid	.65	9	17.39 (4.03)
Schizotypal	.80	22	41.80 (7.99)
Self-defeating	.67	21	46.23 (6.33)

Axis I Clinical syndrome scales	Cronbach's α	Number of items	Raw sum mean (SD)
Generalized anxiety disorder	.79	28	58.82 (9.14)
Major depressive disorder	.88	24	43.46 (10.30)
Posttraumatic stress disorder	.83	14	27.30 (6.53)
Attention-deficit hyperactivity disorder	.91	18	31.60 (9.01)
Schizophrenia	.90	45	86.59 (16.54)
Psychotic thinking subscale	.81	12	20.10 (5.39)

Neuropsychological syndromes	Cronbach's α	Number of items	Raw sum mean (SD)
General neuropsychological dysfunction	.89	18	29.55 (8.58)
Memory and attention subscale	.84	7	12.23 (4.13)
Language dysfunction subscale	.72	5	7.69 (2.58)
Neurosomatic complaints subscale	.74	7	11.22 (3.52)
Executive function deficits of the frontal lobes	.70	16	29.66 (5.29)
Decision-making difficulties subscale	.68	8	13.63 (3.43)
Poor planning subscale	.40	4	9.19 (1.94)
Failure to complete tasks subscale	.69	6	10.81 (2.84)
Mild neurocognitive disorder	.91	31	52.03 (12.38)

Hostility scales	Cronbach's α	Number of items	Raw sum mean (SD)
Anger	.81	15	27.28 (6.44)
Dangerousness	.73	18	33.11 (6.52
Impulsiveness	.49	7	16.32 (3.17)

Other scales	Cronbach's α	Number of items	Raw sum mean (SD)
Maladjustment	.93	60	108.67 (22.11)

Construct Validity: Personality Disorder Scales

A principal component analysis with varimax rotation was performed upon the 14 personality disorder scales' *T* scores. Three components were extracted with eigenvalues above 1.00 (4.48, 3.03, and 2.47 for the three components respectively).

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Table 2. Principal component analysis with varimax rotation of the 14 personality disorder scale's *T* scores of the CCI: Factor loadings

Scale	Factor 1	Factor 2	Factor 3
Antisocial	.07	.89	.20
Avoidant	.89	.01	.02
Borderline	.50	.40	.54
Dependent	.68	−.05	.59
Depressive	.74	.19	.32
Histrionic	−.09	.14	.89
Narcissistic	.22	.43	.62
Obsessive–compulsive	.63	.07	.03
Paranoid	.52	.65	−.01
Passive–aggressive	.56	.48	.37
Sadistic	.06	.88	.18
Schizoid	.67	.31	−.46
Schizotypal	.71	.49	−.09
Self-defeating	.64	.26	.34

Component 1 accounted for 32% of the total variance, and Components 2 and 3 accounted for 22% and 18%, respectively. Table 2 presents the component loadings for the 14 scales on the three extracted factors.

Component 1 appeared to have substantial loadings (>.50) from 10 of the 14 personality disorder scales, with its highest loadings from the Avoidant and Depressive scales. Thus, the primary theme of Component 1 appeared to be the general psychopathology associated with most personality disorders, with strong interpersonal avoidant features coupled with insecurity and a pessimistic life view. Component 2 had three loadings above .50, the Antisocial, Paranoid, and Sadistic scales. Thus, Component 2 appeared to be a good measure of classic antisocial behavior combined with distrust and hypersensitivity. Component 3 had four loadings above .50, the Histrionic, Narcissistic, Dependent, and Borderline scales. The primary themes of Component 3 appeared to be psychopathological need for others, excessive emotionality, and some extroversive component (with the exception, perhaps, of the Dependent scale).

A principal component analysis with varimax rotation was also performed upon the 14 personality disorder scales' individual items. Three components were again extracted with eigenvalues above 1.00 (22.56, 8.57, and 7.42 for the three components respectively). Component 1 accounted for 11% of the total variance, whereas Components 2 and 3 both accounted for 4%.

Component 1 appears to have its most substantial loadings from individual items from the Depressive and Dependent scales. Items loading most strongly on the scale were features of worthlessness, helplessness, low self-esteem, feelings of stress, avoidance of others for fear of rejection, and an overall sense of unhappiness. Component 2 had its highest loadings from the individual items on the Antisocial and Sadistic scales and contained items for six of the seven criteria from the *DSM-IV-TR* diagnosis of antisocial personality disorder. Component 3 had its highest loadings on items from the Histrionic scale. Component 3 also had substantial loadings from items on the Narcissistic, Avoidant, and Schizotypal scales. It appeared that Component 3 was a mixture of psychopathological extraversion (from histrionic and narcissistic items) yet with avoidant and socially anxious components as well.

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The Effects of Violent versus Nonviolent Crimes upon the CCI Scales

The sample was divided into violent ($n = 1382$) and nonviolent ($n = 2580$) offenders based upon the crimes for which the prisoners were found guilty or pled guilty. A review of the *t* tests and effect sizes (correlation of effect size) for the two groups on the 33 scale and subscale *T* score means revealed no significant differences and no effect sizes that even reached the criterion for a small effect size.

The Effects of Age upon the CCI Scales

To determine the influence of age upon the CCI scales, Pearson correlations were first performed between the inmates' ages and *T* scores for the 33 scales and subscales. None of the correlations were significant, and none were above $r = .04$ or below $r = -.04$. Next, the sample was divided into older (50 years old or above, $n = 173$) and younger (17–21 years old, $n = 235$) inmates. The *t* tests and effect sizes again revealed no significant differences and all effect sizes were less than small.

The Effects of Gender upon the CCI Scales

To determine the influence of gender upon the CCI scales, point-biserial correlations were performed between the gender of the inmates and their *T* scores for the 33 scales and subscales. Although 8 of the 33 correlations were significant, none were above $r = .05$ or below $r = -.02$. Next, the sample was divided into a female group ($n = 523$) and an age- and ethnicity-matched group of males ($n = 523$).

For the 14 personality disorder scales, females had significantly higher *T* scores than males on seven scales: Narcissistic, Borderline, Sadistic, Passive–aggressive, Schizotypal, Histrionic, and Paranoid (in the order of magnitude of their *t* values). However, only the Narcissistic personality disorder scale had a correlation of effect size ($r = .12$) that met the minimum criterion for small ($r \geq .10$). It is also interesting to note that there was a remarkable similarity between genders in the overall profiles (means and rankings). For the 14 personality disorder scales' *T* scores rankings for each gender, the correlation for the rankings between genders was $r(12) = .99$, $p < .001$.

For the six Axis I scales and subscales, females had significantly higher *T* scores than males on three scales: ADHD, PTSD, and Schizophrenia (in the order of their *t* values). However, only the ADHD scale had a correlation of effect size ($r = .10$) that met the minimum criterion for a small effect size.

For the nine neuropsychological scales and subscales, there were no significant differences between genders. For the three hostility scales, females had a significantly higher *T* score than males on only the Anger scale, although the effect size was less than the minimum for small. Finally, females had a significantly higher *T* score than males on the Maladjustment scale, although the effect size was also less than small.

Overall Mean *T* Scores, Standard Deviations, and Prevalence Rates for the 33 CCI Scales and Subscales

Tables 3–5 present summaries of the overall mean (SD) *T* scores and prevalence rates for the 14 personality disorder scales, the six Axis I scales and subscales, and the

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Table 3. *T* score means (SD) and prevalence rates for the 14 CCI personality disorder scales

Axis II Personality disorder scales	*T* score	Prevalence rates		
		T score ≥ 60	*T* score ≥ 70	Categorical
	M (SD)	%	%	%
Antisocial	54.27 (10.88)	28	9.1	21.2
Avoidant	48.45 (8.89)	9.5	2	23.6
Borderline	47.99 (8.67)	10.3	1.9	12.5
Dependent	46.69 (9.22)	8.9	1.3	3.3
Depressive	45.21 (10.64)	11.1	2.8	6.8
Histrionic	43.67 (8.58)	3.2	0.3	10.4
Narcissistic	42.76 (8.59)	2.9	0.3	16.6
Obsessive–compulsive	46.98 (8.15)	6.1	0.7	23.5
Paranoid	51.02 (10.05)	15.9	4.2	16.5
Passive–aggressive	46.31 (9.59)	8.1	1.5	6.8
Schizotypal	48.49 (10.59)	13.2	4	8.1
Schizoid	53.81 (10.26)	27	7.7	14.8
Sadistic	47.34 (9.99)	10.9	2.6	10.7
Self-defeating	52.81 (10.04)	23.4	4.7	5.5

nine neuropsychological scales and subscales. Prevalence rates for the 14 personality disorder scales and the Axis I ADHD scale prevalence rates are based on three methods: (a) *T* scores 60 and above, (b) *T* scores 70 and above, and (c) categorically, that is, meeting the minimum number of polythetic criteria as specified in *DSM-IV-TR*. For all other scales, only the *T* score method was used, either because the scale was not in the *DSM-IV-TR* or because the CCI scale did not cover all of the minimum criteria in *DSM-IV-TR*.

Using only the categorical method of determining prevalence rates, 61% ($n = 2401$) of the sample met the diagnostic threshold for at least one personality disorder. For the ADHD scale, 16.3% met the diagnosis.

Critical Items: Drug and Alcohol

There are two critical items on the CCI assessing alcohol or drug problems: Item 17, ''Someone I know thinks I have an alcohol or drug problem.'', and Item 177, ''I have

Table 4. *T* score means (SD) and prevalence rates for the six CCI Axis I scales and subscales

Axis I Clinical syndrome scales and subscales	*T* score	Prevalence rates		
	M (SD)	*T* score ≥ 60 (%)	*T* score ≥ 70 (%)	Categorical (%)
ADHD	45.76 (12.90)	13.4	3.6	16.3[a]
Posttraumatic stress disorder	46.62 (9.91)	9.3	2.6	—
Psychotic thinking subscale	50.03 (11.18)	18.4	6.1	—
Generalized anxiety disorder	48.52 (10.24)	14.3	3.8	—
Schizophrenia	49.11 (10.82)	14.7	4.6	—
Major depressive disorder	49.85 (10.13)	15.4	5	—

[a]Met six of nine criteria for either ADHD inattentive type or hyperactive/impulsive type or met 12 of 18 criteria for ADHD combined type.

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Table 5. *T* score means (SD) and prevalence rates for the nine neuropsychological CCI scales and subscales

Neuropsychological dysfunction scales and subscales	*T* score	Prevalence rates	
	M (SD)	*T* score ≥ 60	*T* score ≥ 70
		(%)	(%)
General neuropsychological dysfunction	46.59 (11.15)	11.9	3.8
Memory and attention subscale	45.81 (10.70)	10.7	3.4
Language dysfunction subscale	48.38 (10.34)	13.2	3.4
Neurosomatic complaints subscale	48.42 (10.64)	12.5	3.9
Executive function deficits	47.09 (9.09)	7.1	1.3
Decision-making difficulties subscale	47.58 (9.56)	8.1	2.2
Poor planning subscale	47.87 (7.56)	4.4	0.6
Failure to complete tasks subscale	45.81 (9.38)	6.2	0.9
Mild neurocognitive disorder	46.84 (10.53)	11.4	3

gotten into trouble because of my drinking or drug problem.'' If the two item response categories *more true than false* and *strongly true* are collapsed into a single positive response for Item 17, then 39% ($n = 1{,}545$) met criterion. For Item 177, 56% ($n = 2{,}219$) met criterion. For either or both items, 60% of the sample met criterion.

DISCUSSION

The median scale reliability was $\alpha = .79$ for all 33 CCI scales and subscales. The median reliability of the 14 personality disorder scales was .78 compared with .76 in the original CATI normative sample (Coolidge & Merwin, 1992). Thus, preliminarily it appears that the CCI scales and subscales possess sufficient scale reliability to warrant further use and investigation. Certainly, the CCI personality disorder scales appear to be as reliable as the original CATI personality disorder scales.

An interesting facet of the present study was the outcome of the screening process, which resulted in eliminating approximately 19% of the initial self-report protocols. A previous study with the MCMI in the same inmate setting (Retzlaff et al., 2002) eliminated only 11% of the inmates' protocols. The more restrictive screening criteria used in the present study, because it included not only excessive denial, item omission, and random responding, raise questions about the extent to which the remaining sample ($N = 3{,}962$) was representative of the initial sample ($N = 4{,}872$) and to what extent the present sample is representative of the population of adult inmate prisoners. Of particular concern was the high rate of random responding (13%), which may have been due to a number of factors: inadequate rapport (the inmates were tested by a single examiner in groups of up to 45), reading level (ninth grade), and a clear lack of specified consequences to inmates for a failure to cooperate with the testing procedures (there are no legal consequences for an inmate's failure to cooperate during CCI testing). Another possibility is that the greater number of items on the CCI (250) compared with the MCMI may result in more random responding, greater denial, and more missing items. Future research,

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however, should address this and other possibilities. A related issue is the ability of inmates to self-report their own neuropsychological problems or deficits. However, there is adequate evidence that patients with mild to moderate brain impairments can reliably and validly report their neuropsychological symptoms, and these reports tend to be significantly more accurate than significant others' reports (e.g., Coolidge, Merwin, Nathan, & Schmidt, 1996; Coolidge, Mull, Becker, Stewart, & Segal, 1998).

A few studies (e.g., Ahlmeyer et al., 2003) have shown that denial is a greater problem in protocol validity than excessive responding or malingering, particularly when parole is a consideration, and this tendency to deny rather than malinger may be particularly true at intake (Gallagher, Ben-Porath, & Briggs, 1997). Nonetheless, the present screening criteria did exclude both excessive denying and item endorsement, and the present prevalence rates are generally in line with a previous MCMI study in the same setting (Wexler et al., unpublished manuscript). Also, based on a meta-study of 62 surveys of 23,000 prisoners, it was found that approximately 65% of those inmates had at least one personality disorder (Fazel & Danesh, 2002). In the present study, this rate was found to be 61%.

The present validation of the CCI could also have been improved had there been accompanying external criterion data in order to provide evidence of convergent and discriminant validity. Because this, indeed, was a large sample of convenience, and because of time restrictions during the inmates' initial entry into the prison, additional clinical interviews, behavioral observations, other diagnostic information, and other validated psychological tests such as the MMPI-2 would also have been invaluable in establishing the construct validity of the CCI.

Another issue with the personality disorder scales of the CCI is item overlap. Because the 14 personality disorder scales of the CCI include all of the criteria from the *DSM-IV* for each of the disorders and because they include items from the associated features section of the *DSM-IV*, there is some item overlap among the scales. However, the *DSM-IV* presents the personality disorders in clusters of related symptomatology, which is an inherent acknowledgement that the personality disorders themselves are related to some extent. Furthermore, it has been long recognized (see, e.g., Livesley, Jang, Jackson, & Vernon, 1993) that personality disorders also share a common hierarchical structure of higher order characteristics; thus, whereas item overlap does tend to create interrelationships among the personality disorders, it is thought that these interrelationships are no mere or simple artifacts of item overlap.

The principal component analysis conducted upon the personality disorder scales' *T* scores and the individual items of the 14 personality disorder scales yielded remarkably similar three-component structures, with the first component receiving heavy loadings from depressive and dependent items, a second antisocial, paranoid, sadistic component, and the third component appearing to be a measure of emotionality and pathological extraversion (e.g., histrionic items). It was difficult to compare the results fully with previous MCMI factor analytic studies (e.g., McCormack, Barnett, & Wallbrown, 1989; Millon, 1987; Piersma, 1986) because those factor analyses involved all of the MCMI scales and not just the personality disorder scales. However, Millon's factor analytic study did find a similar antisocial/sadistic factor and a pathological extraversion/introversion factor. The consistency

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between the two principal component analytic methods in the present study suggests a stable factor structure for the personality disorders among prison inmates.

It was interesting to find little influence of violent crimes, age, or gender effects upon most CCI scales. With regard to the influence of violent versus nonviolent crimes, the distinction may not be valid because some nonviolent offenders may have been charged with violent offenses but pled guilty to nonviolent charges. It is not known to what extent this occurred in the present database, nor are these data readily available. Nonetheless, there yet may be psychopathological differences between violent and nonviolent offenders, and this topic is worthy of further research.

With regard to age and gender effects upon the scales, the present findings were less surprising. The few significant differences in age or gender yielded small or less than small effects sizes. One limitation of the age finding may have been the lack of older inmates. Fewer than 6% of the inmates were over 50 and only 0.4% of the inmates were over the age of 60. With regard to lack of a gender effect, it may be surmised that, whereas the expression of psychopathology may differ for some criteria for some types of psychopathology between genders, on the whole their expression possesses more similarities than differences. One preliminary implication of this finding is that the CCI may require neither age nor gender adjustments.

As noted previously, the prevalence rates obtained for the CCI scales in this sample of inmates was similar to those in previous studies, particularly for the personality disorder scales. Indeed, estimates of serious psychiatric illnesses in prison populations range from 16 to 66%. It has been suggested by a prison psychologist (J. Stoner, personal communication, June 21, 2006) that the drug or alcohol problem prevalence estimation (60%) in the present study may actually underestimate to some degree the actual rate, purported to be about 80% of this specific prisoner population. The other substantial rates of personality disorders (61%) and ADHD types (16%) found in the present study certainly warrants further investigation, as personality disorders and ADHD are highly unlikely to remit spontaneously or be ameliorated by short-term psychotherapies. Their presence also has substantial implications for future recidivism. It is also important to note that prevalence estimates in the present study based on T scores at ≥ 60 and ≥ 70 are dimensional in nature and highly dependent upon the normative group comparison. It may be surmised that estimates based on a T score ≥ 60 may have some tendency to overestimate prevalence whereas T scores ≥ 70 may underestimate true prevalence rates. However, it appears that the present estimates are highly consonant with those from previous studies. It might be more reasonable in future studies to recognize that multiple methods of prevalence estimation might be employed, and ranges of prevalence based on those estimates may prove more practical.

Another advantage of the CCI is the presence of neuropsychological items, including symptoms of executive function deficits of the frontal lobe. Neither of the two most prominent psychological tests (MMPI, MCMI-III) include such items, and, as found in the present study, it appears that not an insubstantial portion of inmates self-reports such dysfunction. Obviously, the presence of neuropsychological symptomatology may also impact therapeutic interventions with inmates and undoubtedly affects future recidivism as well. In summary, it appears as if the CCI, with its broad array of psychopathological and neuropsychological scales, holds promise in the evaluation and screening of prison inmates. Certainly additional research is warranted.

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