An Assessment of Criminal Thinking Among Incarcerated Youths in Three States

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AN ASSESSMENT OF CRIMINAL THINKING AMONG INCARCERATED YOUTHS IN THREE STATES

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The Texas Christian University Criminal Thinking Scales (CTS) instrument has been shown to predict outcomes for institutionalized adult offenders. This article examines responses among male (n = 151) and female (n = 52) incarcerated adolescents, and they were compared to norms for incarcerated adult offenders. The results indicated that the adolescent sample had higher scores on four scales (Entitlement, Justification, Personal Irresponsibility, Power of Orientation) but not on Criminal Rationalization. Scores did not differ by gender or ethnicity of respondents. The results provide convergent validity indicating that the scores for adolescents were correlated with prior history of criminal behavior, substance use, family dysfunction, and *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition* diagnoses of conduct disorder and oppositional defiant disorder. Thus, the CTS may provide useful diagnostic information to help identify youth with a constellation of problem behaviors that predict poor outcomes following incarceration. It also may prove helpful in accounting for individual variations in response to treatment for incarcerated adolescents who receive treatment during reentry back into the community.

Keywords: juvenile psychosocial functioning; juvenile offender problems; conduct disorder; criminal thinking; family functioning

Research has established that youths in the juvenile justice system are likely to experience a variety of interrelated problems including antisocial attitudes, dysfunctional family relationships, problematic peer relationships, mental health disorders, and substance abuse problems (Abram, Teplin, McClelland, & Dulcan, 2003; Cocozza & Skowyra, 2000; Dembo & Schmeidler, 2003; Jainchill, De Leon, & Yagelka, 1997; Otto, Greenstein, Johnson, & Friedman, 1992; Teplin, Abram, McClelland, Dulan, & Mericle, 2002; Wasserman, McReynolds, Larkin, Fisher, & Santos, 2002). These issues represent important challenges to the provision of effective treatment interventions. How and to what

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degree emotional and/or psychological problems of youths may affect their responses to treatment and subsequent posttreatment outcomes are not well-understood.

However, several studies suggest that comorbidity status among youths is linked to poorer treatment retention as well as earlier and more severe relapse and recidivism episodes (Adams & Wallace, 1994; Myers, Brown, & Mott, 1995; Williams & Chang, 2000; Winters, 1999). Youths with comorbid attention-deficit hyperactivity disorder (ADHD) and conduct disorder may be particularly prone to early termination from treatment, whereas those with a comorbid mood or adjustment disorder have higher completion rates (e.g., Kaminer, Tarter, Bukstein, & Kabene, 1992). In a study that examined internalizing and externalizing disorders in relation to posttreatment outcomes among adolescents admitted to three residential drug-treatment programs, those with both internalizing and externalizing disorders had higher pretreatment levels of problems and poorer outcomes (Shane, Jasiukaitis, & Green, 2003). Higher levels of cumulative lifetime psychiatric disorders have likewise been associated with higher level of sexual risk behaviors (Tubman, Gil, Wagner, & Antigues, 2003), further emphasizing the need to identify youths along dimensions of substance use, criminal involvement/psychopathy, and psychiatric disturbance.

Psychopathy has been associated with poor treatment outcomes among adolescents in residential treatment programs (Rogers, Johansen, Chang, & Salekin, 1997). The majority of criminally involved youths commit relatively minor offenses and their delinquent behavior tends to be of limited duration (Moffitt, 1993). These "adolescence limited" offenders end their criminal involvement in mid- to late adolescence and tend to move on to satisfactory adjustment in adulthood. However, some youths initiate illegal activity at an early age, exhibit extensive criminal behavior throughout adolescence, and go on to criminal careers as adults (Moffitt, 1993). These "life course persistent" delinquent youths pose significant long-term risks to society in terms of public safety and economic costs because of incarceration.

A number of clinical trials have examined interventions designed to impact antisocial attitudes, mental health disorders, and substance abuse problems of adolescent offenders. These controlled trials have demonstrated efficacy for family and cognitive-behavioral interventions for improving substance-use outcomes of adolescent offenders (e.g., Dennis et al., 2004; Kaminer & Burleson, 1999; Liddle et al., 2001; Waldron, Slesnick, Brody, Turner, & Peterson, 2001). However, these interventions have produced substantial variability in outcomes (cf., Waldron, Turner, & Ozechowski, 2005, 2006). For example, only 40% of treated adolescents remain abstinent after 1 year, whereas 30% relapse and another 30% show no improvement during treatment. These variations in outcome are likely the result of differences in adolescent risk levels, especially those related to "criminal thinking." These findings underscore the importance of assessing adolescent criminal thinking, particularly in an effort to inform intervention assignment.

FAMILY DYSFUNCTION AND CRIMINAL-THINKING ATTITUDES

Family functioning is one important influence on the emergence and maintenance of adolescent problem behaviors as well as substance-abuse disorders (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). Family treatments that target these dysfunctional family relationships have been shown to be effective in reducing adolescent problem behaviors (Stanton & Shadish, 1997). It is unclear whether criminal-thinking attitudes are associated with dysfunctional family relationships. Waldron et al. (2006) found that higher

levels of dysfunctional family relationships, as measured by the Family Environment Scale (FES; Moos & Moos, 2002), predicted poor outcomes for substance-abusing adolescents who were treated in outpatient settings. These dysfunctional family relationships may contribute to antisocial behavior and attitudes. The antisocial attitudes may exacerbate existing patterns of dysfunctional relationships.

In the present study, therefore, relationships between Texas Christian University (TCU) Criminal Thinking Scales (CTS) indicators of antisocial attitudes and FES indicators of family functioning were examined to assess the extent to which criminal thinking and family functioning represent independent or interdependent constructs. Prior research has demonstrated that the TCU instrument provides a psychometrically sound assessment of antisocial attitudes that are quite pervasive among adult criminal offenders. These adults often are characterized by a set of thinking processes that support their criminal lifestyle (Knight, Garner, Simpson, Morey, & Flynn, 2006; Walters, 1995). Furthermore, the scales are related to criminal conduct for adult offenders (Knight et al., 2006). If these same types of antisocial attitudes are detectable during adolescence, they may help predict which adolescents are more likely to persist in criminal careers through adolescence and into adulthood.

OPPOSITIONAL DEFIANT DISORDER AND CONDUCT DISORDER

A corollary assessment of criminal thinking among adolescent offenders is based on the *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition, Text Revision* (*DSM-IV-TR*) diagnoses of either oppositional defiant disorder (ODD) or conduct disorder (CD; American Psychiatric Association, 2005). These two diagnoses reflect problem-behavior patterns characterized by aggression, property destruction, deceitfulness, or lack of regard for rules or laws. The ODD diagnosis represents a somewhat milder form of problem behaviors than the CD diagnosis. The rates of CD in incarcerated samples range from 35% to 60% depending on the assessment period (i.e., 30 days, 6 months, past year), and there does not seem to be a significant gender difference in rates among adjudicated samples (e.g., Teplin et al., 2002; Wasserman, McReynolds, Ko, Katz, & Carpenter, 2005). However, Jainchill et al. (1997), in a comparable sample of justice-involved youths, reported higher prevalence rates for girls than for boys.

As a second major goal of the present study, assessments of CD and ODD were examined in relation to the CTS constructs. The present research sought to develop convergent evidence for the validity of the CTS in measuring criminal thinking among a sample of incarcerated adolescent offenders and examined the relationship of this instrument (Knight et al., 2006) with *DSM-IV* diagnoses of ODD. In addition, this instrument and *DSM-IV* diagnoses were compared to self-reported measures of delinquency and substance abuse.

METHOD

This study was part of a larger project examining the comparative effectiveness of three different reentry strategies (functional family therapy, cognitive restructuring, and standard services) for youths released from juvenile commitment programs to their home communities (Jainchill, Dembo, Hawke, Alexander, & Turner, 2005). The larger project is being led by the Midwest Research Center, one of nine research centers in the National Institute on Drug Abuse (NIDA)–funded Criminal Justice Drug Abuse Treatment Systems (CJ-DATS) initiative.

In-depth interviews were completed with 203 youths incarcerated in residential commitment programs in Pennsylvania, Ohio, and Delaware. The interviews, which averaged 3 hours in length, took place in private locations at each of the residential facilities. A NIDA Certificate of Confidentiality was obtained to protect the privacy of adolescents' responses. The consent procedures varied across settings because some sites had legal authority over youths in custody, whereas other sites required parental consent. Refusal rates averaged 10% across sites. One facility located in Delaware (see below) had notably higher refusal rates (24.4%) because parental consent was required at that site, and the rates for the other locations ranged between 2.1% and 13.0%.

SAMPLE CHARACTERISTICS

The sample consisted of male (n = 151) and female (n = 52) adolescents who consented to participate in the study. These youths were incarcerated in a juvenile detention facility for an average of 167 days (SD = 155 days, median = 132 days). Approximately 10% had been incarcerated more than 1 year. The ethnic or racial composition of the sample was African American (36%), Anglo (45%), Hispanic (9%), or other (5%). The sample ranged in age from 13 to 20 years (M = 16.8, SD = 1.34). Few of the adolescents (11%) lived with both of their biological parents prior to their incarceration. A variety of educational problems were reported prior to incarceration, with 56% repeating at least one grade, 35% being suspended for 10 or more days, and 19% being expelled for 10 or more days. In addition, many youths (45%) indicated that they had previously received some type of substance-abuse treatment. The youths were incarcerated in commitment facilities in Ohio (41%), Pennsylvania (38%), and Delaware (20%).

MEASURES

Assessments focused on the following domains: (a) criminal thinking (Knight et al., 2006); (b) self-reported delinquency (Elliott, Huizinga, & Ageton, 1985); (c) *DSM-IV* diagnoses resulting from administration of the Voice Diagnostic Interview Schedule for Children (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000; Wasserman et al., 2002); (d) self-reported frequency of use of alcohol, marijuana, cocaine, and the illegal use of sedatives and stimulants; and (e) adolescent perceptions of family functioning, as assessed with the FES (Moos & Moos, 2002).

Criminal thinking. Researchers at TCU (Knight et al., 2006) developed the instrument on the basis of collaborative research completed with the Federal Bureau of Prisons. The instrument assesses six domains of cognitive risk or antisocial attitudes (Walters, Trgovac, Rychlec, Di Fazio, & Olsen, 2002; Yochelson & Samenow, 1976) that are related to criminal behavior (Gendreau, Little, & Goggin, 1996). Informed by studies involving adult offenders, five scales seemed particularly useful for the present study in identifying the antisocial attitudes of juvenile offenders: (a) Entitlement (a sense of ownership and privilege, and the feeling that the world owes them special consideration), (b) Justification (the tendency to minimize the seriousness of antisocial behavior and to justify these actions because of external or extenuating circumstances), (c) Power Orientation (the need for power and to

control or manipulate others), (d) Criminal Rationalization (the belief that one's criminal acts are no different from similar acts committed every day by authority figures, who don't get caught), and (e) Personal Irresponsibility (the unwillingness to accept responsibility for one's behavior and the tendency to blame others). The sixth scale, Cold-Heartedness, was not used in this study because its concept was captured by another measure used in the first phase of the project.

The same scoring procedure used with adults was used for this study. Five-point, Likert-type scales (1 = *disagree strongly*, 2 = *disagree*, 3 = *uncertain*, 4 = *agree*, 5 = *agree strongly*) were used to rate each item in the scales. For each scale, scores are calculated by averaging the ratings of the items composing the scale (after reversing scores on reflected items), then multiplying the scale scores by 10 to rescale the final scores to range from 10 to 50. Reliability coefficients were computed for the five criminal thinking subscales used in this study: Entitlement (α = 0.85), Justification (α = 0.77), Power Orientation (α = 0.83), Criminal Rationalization (α = 0.76), and Personal Irresponsibility (α = .66). These alpha levels compare favorably with internal consistency reliabilities obtained from adult studies (Knight et al., 2006); these included Entitlement (α = 0.78), Justification (α = 0.75), Power Orientation (α = 0.81), Criminal Rationalization (α = 0.71), and Personal Irresponsibility (α = .68).

A confirmatory factor analysis was completed involving the specification of one factor on which the five scales were loaded. Mplus version 4.1 (Muthén & Muthén, 2006) was used to estimate the model. Results indicated a good fit of the model to the data (χ^2 = 9.48, *df* = 5, *p* = .09; comparative fit index = 0.991, Tucker-Lewis coefficient = 0.983; root mean square error of approximation = 0.067).

Self-reported delinquency. National Youth Survey self-report delinquency questions (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983) were used to probe delinquent behavior in the year prior to initial interviews. Youths were asked how many times they engaged in 23 different delinquent behaviors. Furthermore, for each of the 23 delinquent behaviors in which the youths claimed to have engaged, they were asked the age during which the act first occurred.

Based on the work of Elliott et al. (1983), and on the youths' claimed frequency of participation in delinquent acts, the following four summary indices of delinquent involvement were developed:

a. *General Theft*: stole a motor vehicle, stole something worth more than $50, bought stolen goods, stole something worth less than $5, stole something worth between $5 and $50, broke into a building or vehicle, and joyriding.
b. *Crimes Against Persons*: aggravated assault, gang fights, hit a teacher, hit a parent, hit a student, sexual assault, strong armed students, strong armed teachers, or others.
c. *Index Crimes*: aggravated assault, sexual assault, gang fights, stole a motor vehicle, stole something worth more than $50, broke into a building or vehicle, strong armed students, strong armed teachers, and strong armed others.
d. *Drug Sales*: sold marijuana or hashish, sold cocaine or crack, and sold other hard drugs such as heroin or LSD.

An Index Crimes scale was created as a global index of serious crime, but it contained items that overlapped with the General Theft and Crimes Against Persons scales. The youths reported frequent involvement in General Theft (*M* = 8.03), Crimes Against Persons

($M = 4.88$), Index Crimes ($M = 4.98$), and especially, Drug Sales ($M = 65.6$) in the year prior to their incarceration.

Self-reported frequency of alcohol, marijuana, cocaine, and the illegal use of sedatives or stimulants. Questions probed the frequency of substance use during the year prior to incarceration. Self-reported prevalence rates were: tobacco, 76%; alcohol, 77%; marijuana, 80%; cocaine, 22%; opiates, 16%; hallucinogens, 16%; PCP, 15%; inhalants, 10%; and the nonmedical use of sedatives, 21%, and stimulants, 19%.

FES. Two family relationship subscales from the FES (Moos & Moos, 2002) were used to probe youths' perceptions of their current family environment: Cohesion (tapping the degree of commitment, support, and help that family members give one another) and Conflict (the amount of conflict and openly expressed anger among family members). Both measures, Cohesion ($\alpha = .78$) and Conflict ($\alpha = .75$), as well as other FES scales, have been found to have good psychometric properties (Moos & Moos, 2002).

In completing the FES forms, respondents were asked to answer true (or mostly true) or false (or mostly false) to various statements about their families. In this study, the FES had acceptable reliability ($\alpha = 0.77$) for both the Conflict and Cohesion subscale summary measures. In addition, these two scales were significantly related to each other, $r(191) = –.55$, $p < .001$. The Conflict scale was reversed and a summed composite scale was computed based on the mean of these two measures to reflect family functioning. Higher scores indicated better family functioning.

DSM diagnosis of CD. The Voice DISC-IV (Shaffer et al., 2000; Wasserman et al., 2002) was used to obtain the prevalence rates for CD (past 30 days and past year) and ODD (past 30 days). The prevalence of CD assessed during the past 30 days was 32.6%, and that assessed in the past year was 58.5%. The prevalence of ODD assessed during the past 30 days was 18.0%. These data were used for epidemiological, not clinical, purposes.

ANALYTIC PLANS

The first analytic objective was to compare the prevalence of antisocial attitudes among the adolescent offenders to the CTS norms reported for adults in Knight et al. (2006). First, the adolescent means on each scale were compared with the adult means reported in Knight et al. (2006). Comparisons were made using an effect size statistic (Cohen's *d*) rather than a traditional test of significance. Because a significance test is heavily dependent on the specific sample size for the comparison, an index that was independent of the sample size was chosen. Part of this objective was to determine how the study sample compared to the adult norms in terms of the variability of responses about the mean for each scale. To accomplish this objective, the percentage of the adolescent sample that was greater or less than two adult norm thresholds, the 33rd and the 67th percentiles (Knight et al., 2006), was compared.

A second objective was to examine the convergent validity of the CTS dimensions with indices of prior criminal behavior, prior substance abuse, CD, ODD, and family dysfunction. These analyses were performed using Pearson correlation coefficients to assess the strength of association among the various measures.

TABLE 1: Descriptive Statistics for the Adolescent Sample on the Criminal Thinking Scales (CTS)

CTS	M	SD	*Effect Size (d)*	*33rd (%)*	*67th (%)*	*Skewness*	*Kurtosis*
Entitlement	25.1	8.2	0.65	83	66	0.209	0.213
Justification	25.0	7.9	0.47	82	55	0.019	–0.085
Power Orientation	30.5	8.1	0.59	79	55	–0.079	0.028
Personal Irresponsibility	25.5	7.2	0.50	82	50	–0.093	–0.089
Criminal Rationalization	30.1	8.4	–0.26	52	18	0.152	–0.006

RESULTS

COMPARISONS OF ADOLESCENT SAMPLE TO ADULT NORMS

Means, standard deviations, skewness, and kurtosis estimates for each of the five CTS dimensions were calculated and are reported in Table 1. None of the skewness or kurtosis estimates was statistically significant, suggesting that responses on each scale were approximately normally distributed. Next, two MANOVAs were completed with ethnicity (African American, Caucasian, Hispanic, other) and gender as the independent variables, using the five scale scores as dependent variables. The results revealed nonsignificant main effects both for the ethnicity, $F(15, 508) = 1.05$, $p < .40$, $\eta^2 = 0.028$, and the gender, $F(5, 193) = 0.89$, $p < .49$, $\eta^2 = 0.023$, independent variables. Separate univariate analyses on each dimension indicated that neither the gender nor ethnicity effects were significant for any of the scales.

To compare the mean levels of the responses of the adolescents to the norms for incarcerated adults, an effect size index (Cohen's *d*) for each dimension was created by (a) subtracting the mean of the adult norms from the adolescent sample mean and (b) dividing this difference by the adolescent sample standard deviation. As shown in Table 1, the results reveal relatively large effect sizes for the Entitlement, $d = 0.65$, $t(202) = 9.26$, $p < .001$; Justification, $d = 0.47$, $t(202) = 6.70$, $p < .001$; Power Orientation, $d = 0.59$, $t(202) = 8.41$, $p < .001$; and Personal Irresponsibility, $d = 0.50$, $t(202) = 7.12$, $p < .001$; but a small negative effect size for Criminal Rationalization, $d = –0.26$, $t(202) = 3.70$, $p < .001$. Thus, compared to adults, the adolescent incarcerated sample reported higher levels of criminal-thinking attitudes on each scale except for Criminal Rationalization.

A second approach was used to examine the heterogeneity of criminal-thinking attitudes in the adolescent and adult samples. Knight et al. (2006) reported the 33rd and the 67th percentile scores for each dimension. Using these values, the percentage of the adolescent sample that was greater than these two threshold points was computed (see Table 1). These findings indicate that a much higher percentage of the adolescent sample was greater than the 67th percentile of adult offenders on the Entitlement (67%), Justification (55%), Power Orientation (55%), and Personal Irresponsibility (50%) scales but not on the Criminal Rationalization scale (18%). Note that only 33% greater than this threshold was expected if the adult and adolescent distributions were comparable. In summary, these findings suggest that the prevalence of criminal-thinking attitudes is much higher for the adolescent incarcerated sample than for the adult incarcerated sample.

TABLE 2: Correlations of CTS Dimensions With FES and *DSM-IV* Indicators

	Entitlement	*Justification*	*Power*	*Criminal Rationalization*	*Personal Irresponsibility*
Dependent Variable	r	r	r	r	r
FES (functioning)	–.30***	–.29***	–.29***	–.26***	–0.26***
CD (year)	.14*	.15*	.28***	.13*	.08
CD (month)	.15*	.03	.31***	.04	.08
ODD (month)	.13*	.15*	.26***	.03	.10

Note. CTS = Criminal Thinking Scales; FES = Family Environment Scale; *DSM-IV* = *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition*; CD = conduct disorder; ODD = oppositional defiant disorder. Cell entries are Pearson correlations.
*$p < .05$, two-tailed. ***$p < .001$, two-tailed.

Correspondence of CTS, DSM-IV*, family relations, substance use, and criminal behavior*. The analyses next assessed the correlations of the CTS dimensions with various measures of adolescent functioning that have been previously linked to treatment outcomes. The correlations of the scales with the *DSM-IV* diagnoses of ODD (past month), CD (past year, past month), and the FES measure of family relations (Conflict–Cohesion) are reported in Table 2. Results indicate that the CTS was more consistently related to the FES relationship dimension than to the *DSM-IV* diagnoses. That is, the FES was significantly correlated with each CTS dimension ($p < .001$), suggesting that the adolescent's antisocial attitudes were associated with greater family conflict.

The Power Orientation dimension was significantly related to both CD (past year, past month) and the ODD (past month) dimensions ($p < .001$). The Justification subscale was significantly correlated with the CD (past year) and ODD (past month) *DSM-IV* diagnoses ($p < .05$). Finally, the Entitlement dimension was significantly related to CD (past year and past month) but not significantly related to ODD (past month). Because the CTS measurement level is continuous and the *DSM-IV* diagnoses are dichotomous, biserial (rather than Pearson) correlations were computed to examine their relationships. The results were similar using biserial correlations.

Past history of criminal behavior. The youths reported engaging in multiple acts of delinquency during the year prior to their incarceration, with high prevalence rates being reported for General Theft (72%), Crimes Against Persons (83%), Index Offenses (89%), and Drug Sales (65%). Correlations of the CTS dimensions with past history of criminal behavior and substance-use measures are presented in Table 3. These findings revealed that General Theft is significantly associated with the Entitlement and Power Orientation scales ($p < .01$). Entitlement also was associated with self-reported levels of Drug Sales ($p < .01$) and the Index Crimes ($p = .05$) measure. Criminal Rationalization was associated with Drug Sales ($p < .05$).

Analyses of the relationships between the CTS dimensions and prior history of drug use revealed that several scales were significantly related to marijuana use (for Justification, Criminal Rationalization, and Personal Irresponsibility, $p < .05$). Four scales (Justification, Power Orientation, Criminal Rationalization, and Personal Irresponsibility) were significantly related to sedative use, and Justification was significantly related to inhalant use. The CTS dimensions were not significantly associated with use of other substances.

Because of the large number of tests that were computed, it is not appropriate to claim that the results are statistically significant by interpreting each test of significance as a separate

TABLE 3: Correlations of CTS Dimensions With Criminal History and Drug Use

	Entitlement	*Justification*	*Power*	*Criminal Rationalization*	*Personal Irresponsibility*
Dependent Variable	r	r	r	r	r
General Theft	.20***	.13	.29***	.11	.10
Crimes Against Persons	.06	.11	–.02	.03	.02
Index Crimes	.14*	.14	.10	.04	.08
Drug Sales	.22**	.13	.07	.18*	.07
Marijuana	.12	.16*	.08	.22**	.18*
Cocaine	–.07	.05	–.06	–.03	–.12
Sedatives	.16	.20**	.19**	.23***	.16*
Inhalants	.09	.18*	.09	.03	–.02

Note. CTS = Criminal Thinking Scales. Cell entries are Pearson correlations.
*$p < .05$, two-tailed. **$p < .01$, two-tailed. ***$p < .001$, two-tailed.

study at the .05 level. A strategy proposed by Miller (1981) was, therefore, followed, which groups the tests into "families" and evaluates each family as a separate study at the .05 significance level, using the Bonferroni inequality. This provides a reasonable balance and yields a small number of conclusions concerning substantively distinct objectives of research. Using this strategy, the multiple tests were grouped into four families (FES, *DSM* diagnoses, self-reported delinquency, and self-reported drug use). When the results were evaluated by this standard, the results reported in Tables 2 and 3 remained statistically significant, confirming the strength of the convergent validities.

DISCUSSION

The present study found that the CTS dimensions have good reliabilities among adolescents. Also, the sample of adolescents had scale scores that were higher generally than comparable scores for adult offenders, raising questions about the implications of the CTS instrument for predicting long-range behaviors of young offenders. If these attitudes exist in adolescent offenders, they may reflect processes that lead adolescents deeper into the criminal justice system as adults. One reason for focusing on these criminal attitudes is that they may be susceptible to change with carefully constructed interventions (Knight et al., 2006). Hence, this instrument offers promise as a tool for improving the match between intervention strategies and client needs. Assessment of criminal attitudes before and after treatment interventions may provide more precise estimates of clinical outcomes than can be achieved by other measures, such as prior criminal histories (Knight et al., 2006).

This study has some important limitations. First, it is a cross-sectional study and it does not provide a prospective examination of the association of the various CTS measures to long-term juvenile justice outcomes. Another limitation is that the investigators were not able to recruit a sufficiently large sample of Hispanic females (the data set contained only three cases) to examine their responses independently. It is expected that some of these issues will be addressed in ongoing research using much larger samples. It also will examine changes in criminal-thinking attitudes, as well as related behavioral outcomes of substance abuse and criminal behavior. Of particular interest is how interventions being studied

might impact substance abuse and criminal behavior directly and indirectly by affecting changes in criminal thinking.

Despite these limitations, the CTS scales showed good convergent validities with other indicators of antisocial behaviors, including history of criminal behavior, drug use, family relations, and clinical diagnoses (CD and ODD) among the adolescents in this study. These findings will help guide analytic plans for a larger project in progress that includes a randomized clinical trial involving adolescent offenders to assess the effectiveness of three reentry strategies (functional family therapy, cognitive restructuring, and standard services). These clinical interventions are designed to target antisocial attitudes and behavior as well as dysfunctional family relationships, and the CTS is expected to be a useful instrument in assessing the differential effectiveness of these treatments.

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