The Millon Adolescent Clinical Inventory in the Assessment of Juvenile Offenders

A Dissertation Presented to

The Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy.

David W. McConville, M.A.

May, 2004

Abstract

This study examined the utility of the Millon Adolescent Clinical Inventory (MACI) in the assessment of 135 incarcerated juvenile offenders. The three primary research questions were: (1) What is the MACI profile for juvenile offenders? (2) Are there distinctive characteristics in the MACI profiles of aggressive offenders, chronic offenders, or sex offenders? (3) Do juvenile offenders with mood disorder, conduct disorder, or substance abuse disorder have distinguishing MACI profiles? This study also investigated the factor structure of the MACI and compared results using factor scores versus individual MACI scales.

Participants in this study were 135 volunteer adolescents admitted to a centralized intake facility for the state juvenile correctional center in Richmond, Virginia. The participants ranged in age from 13 to 18, with a mean age of 16 years. Each participant completed the MACI during their initial intake period. MACI results were compared with clinical data gathered by the institution's Behavioral Services Unit staff, including psychiatric diagnosis, history of drug and alcohol use, and offense history. Researchers also coded violent offense history and institutional infractions for violent behavior. Clinical staff members completed a modified version of the Observed Aggression Scale.

An exploratory factor analysis of MACI scales revealed a three-factor solution for Personality Patterns, and two factor solutions for Expressed Concerns and Clinical Syndromes scales. The factors accounted for 82, 66, and 78% of the variance respectively. Theoretically related factors were correlated with outcome criteria related to mental health problems (.18 to .39) and offense history characteristics (.18 to .28). MACI factors were able to classify offenders with mood disorders, conduct disorders, and

substance abuse problems with moderate accuracy (65 to 78%). Factors adequately discriminated between violent offenders, sex offenders, and chronic offenders (58 to 82%). The results of this study support the MACI as a useful instrument for clinicians working in juvenile offender institutions.

Human Services

Curry School of Education

University of Virginia

Charlottesville, Virginia

APPROVAL OF THE DISSERTATION

This dissertation, *The Millon Adolescent Clinical Inventory in the Assessment of Juvenile Offenders,* has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree Doctor of Philosophy.

Dewey G. Cornell, Ph.D., Advisor

Ann Booker Loper, Ph.D.

Peter Sheras, Ph.D.

Don Ball, Ph.D.

Table of Contents

List of Tables

List of Figures

Chapter 1: Juvenile Offenders in Correctional Settings

Mental Health Problems

Many incarcerated juveniles offenders have emotional and behavioral disorders that require mental health treatment (Otto, Greenstein, Johnson, & Friedman, 1992; Teplin, 2001; McGarvey & Waite, 1999). The purpose of this study was to examine the value of a self-report inventory that could be used to help identify juvenile offenders with mental health treatment needs. A comprehensive review of the research literature on the prevalence and types of mental disorders among youth in the juvenile justice system concluded that these youth experience substantially higher rates of mental disorders than youth in the general population (Cocozza & Skowyra, 2000). A study by Atkins et al., (1999), estimated that 60% of youth receiving counseling services from community mental health centers met diagnostic criteria for a mental disorder, in comparison to 72% of incarcerated youth. In Chicago, a study of delinquent youth reported that 64% of males met diagnostic criteria for at least one mental disorder (Abram, Teplin, McClelland, & Dulcan, 2003; Teplin, 2001). A study of intakes to the Virginia Department of Juvenile Justice over an eight-year period ending in 1998 revealed that 47% of incarcerated males were identified as warranting mental health treatment (McGarvey & Waite, 1999).

Studies of incarcerated youth use various terms to refer to mental health problems, including mental disorders, psychological disorders, and psychiatric diagnoses. These terms are often used interchangeably when studies are referring to mental disorders listed in the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV). For the purposes of this study, I will use the term mental health problems when referring to emotional and behavioral problems that require mental health

treatment. This will include, but not be limited to, mental disorders listed in DSM-IV. For example, symptoms of depression and/or suicidal behavior are extremely important variables to assess in the evaluation of juvenile offenders regardless of whether the youth meets specific DSM-IV criteria for a diagnosis of a major depressive disorder. Thus, the term mental health problems will encompass mental disorders, as well as symptoms and behaviors that indicate a need for mental health treatment.

Prevalence rates of mental health problems. Perhaps the first comprehensive attempt to quantify prevalence rates of mental health problems among juvenile offenders was conducted by Otto, Greenstein, Johnson, and Friedman (1992). These authors reviewed existing research on the prevalence rates of mental health problems among youth in the juvenile justice system. The authors had difficulty synthesizing the literature on prevalence rates because of a number of methodological issues, such as the differences in data collection methods between studies, particularly in how mental disorders were assessed and quantified. These problems led to obvious difficulties generalizing from study to study. Although the authors were not able to determine a specific rate of mental disorders from their review, the primary finding from their study was that prevalence rates for mental disorder were substantially higher for juvenile offenders than for juveniles in the general population (Otto, Greenstein, Johnson, & Friedman, 1992).

Since that review in 1992, several studies have reported that the majority of juvenile offenders appear to suffer from one or more types of mental health problems. One study reported that over 58% of a sample of incarcerated adolescents met criteria for two or more mental disorders, while less than 12% of non-incarcerated adolescents met the same criteria (Ulzen & Hamilton, 1998). Another study examining the prevalence of

alcohol, drug, and mental disorders among juvenile offenders found that 64% of participants met criteria for one or more disorders (Teplin, 2001). By contrast, estimates of the prevalence rate for mental disorders in the general population are closer to 20% (Brandenberg, Freedman, & Silver, 1990). Such findings have led some authors to note that rates of mental health problems among juvenile offenders are more similar to rates of adolescents being served in community mental health settings than those of adolescents in the general population (Atkins, 1999; Cohen, 1990).

More extensive research is being conducted to better understand the prevalence of mental health problems within this population. For example, the Northwestern Juvenile Project (Teplin, 2001) is a longitudinal study in Chicago that is examining the prevalence of alcohol, drug, and mental disorders among youth involved in the juvenile justice system. Researchers are studying substance abuse and mental disorders among 1,830 delinquent youth (1,172 males, 658 females) that were held in the Cook County Juvenile Temporary Detention Center. Participant ages ranged from 10 to 18. Researchers conducted a comprehensive assessment with the detainees shortly after their arrest. The assessment included administration of the Diagnostic Interview Schedule for Children (DISC) to determine the types of mental disorders, the Columbia Impairment Scale to rate functional impairment, and the Child and Adolescent Services Assessment – Modified to collect data on prior service usage. Data on educational deficits, criminal history, and demographic variables were also collected. Additionally, interview data and archival data covering arrest and incarceration history were reviewed, and urine samples were collected to screen for drug use (Teplin, 2001).

Preliminary results from this study showed that nearly two-thirds of the youth in the sample have one or more alcohol, drug, or mental disorders. The authors have not yet reported rates of specific mental disorders. However, based upon their preliminary findings, they have projected that nationwide, nearly 670,000 youth who are processed by the juvenile justice system each year qualify for an alcohol, drug, or mental disorder requiring treatment (Teplin, 2001).

The rates reported by Teplin suggest that juvenile offenders are a population with significant mental health problems, and that juvenile facilities must develop assessment procedures to meet this demand for services. For many facilities, an extensive assessment as conducted by the Northwestern Juvenile Project is not feasible due to time and budgetary constraints. Therefore, facilities that cannot allocate staff to conduct intensive diagnostic interviews, gather information on family and educational history, review records for offense history information, or collect urine samples for drug screening need to develop a less intensive process that can assess for a broad range of substance and mental health problems. One possibility is to use a self-report personality inventory to screen youth for mental health problems as they are admitted to juvenile facilities. However, more information is needed on the validity of self-report measures for the screening of juvenile offenders.

McGarvey and Waite (2000) examined prevalence rates of mental health disorders among youth remanded to the Virginia Department of Juvenile Justice. All youth committed to the custody of the Virginia Department of Juvenile Justice enter the system through the Reception and Diagnostic Center (RDC) located in Bon Air, Virginia. Youth spend their first four weeks at the RDC being evaluated for service needs and matched with

an appropriate housing placement at one of seven juvenile correctional facilities where they will complete their sentence (McGarvey & Waite, 2000). The evaluation includes a physical examination conducted by a physician and a nurse, a psychological assessment conducted by a psychologist, and an educational assessment conducted by an educational specialist. Staff psychologists conduct psychological evaluations on each youth consisting of one to one clinical interviews, and administration of standardized measures such as the Personality Inventory for Youth (PIY), and the Wechsler Intelligence Scales for Children – Third Edition (WISC-III). Case files and history of prior psychological functioning, history of prior psychiatric illness and prior psychotropic medication use, are reviewed.

At the conclusion of this evaluation process, each youth's staffing team determines whether youth have a mental health need requiring treatment. For those youth identified as having a need for mental health services, individual and/or group therapy is incorporated into a treatment plan that guides mental health interventions at each youth's facility. In 2000, over 47% of male offenders had a designated mental health need requiring treatment as identified during the assessment at RDC. Virginia youth remanded to correctional facilities in 2000 also had the following characteristics: 62% of males met diagnostic criteria for conduct disorder and 25% met criteria for co-occurring attention deficit hyperactivity disorder; 38% of males reported a history of medication use for depression or other mood disorders; 11% of males reported multiple psychiatric hospitalizations prior to incarceration due to mental illness and an additional 12% reported at least one psychiatric hospitalization prior to incarceration (McGarvey & Waite, 2000).

Conduct disorder and comorbidity. Research on prevalence rates of mental health problems indicates that conduct disorder is the most common diagnosis given to juvenile

offenders (McManus, Alessi, Grapentine, & Brickman, 1984; Milin, Halikas, Meller, & Morse, 1991). The DSM-IV defines conduct disorder as a repetitive and persistent pattern of behavior marked by the violation of the rights of others, or of major societal norms and rules (p. 85). There are four main subgroups for conduct disorder. These groups include aggressive conduct which is characterized by threatening or committing physical harm towards others, destruction of property which is characterized by committing acts leading to property loss or damage, deceitfulness or theft such as breaking and entering or conning others, and serious violation of rules at home or at school such as chronic truancy or running away. Prevalence rates of conduct disorder in the general population were estimated by DSM-IV to be higher for boys (6% to 16%) than for girls (2% to 9%) among adolescents under the age of 18.

High rates of conduct disorder among juvenile offenders are to be expected since many of the criteria for a conduct disorder diagnosis can result in incarceration. Several studies have shown that the majority of juvenile offenders meet criteria for conduct disorder diagnoses. For example, McManus, Alessi, Grapentine, and Brinkman (1984) studied a sample of 71 adolescents incarcerated in a facility for serious juvenile offenders. The authors found that all 40 boys in the sample met the criteria for conduct disorder as determined by structured diagnostic instruments (the Schedule for Affective Disorders and Schizophrenia, the Hamilton Rating Scale for Depression, the Carroll Rating Scale for Depression). Milin, Halikas, Meller, and Morse (1991) conducted a study of 111 juveniles referred from a county juvenile court for offenses that included break-in, theft, robbery, disorderly conduct, vandalism, or running away. Based upon results of the Diagnostic Interview For Children and Adolescents (DICA) that was

administered to each subject, the authors reported that 90% of all subjects met criteria for conduct disorder.

Because of such high rates of conduct disorder among juvenile offenders, the study of conduct disorder as a singular diagnosis within this population may be of limited utility. Recent studies of conduct disorder among juvenile offenders have focused upon the rates and implications of co-occurring, or comorbid diagnoses that frequently accompany a diagnosis of conduct disorder. It appears that offenders with diagnoses of conduct disorder and additional mental disorders are at increased risk for earlier onset of delinquent behavior (Forehand, Wierson, Frame, Kempton, & Armistead, 1992), increased rates of suicide attempts (Rhode, Mace, & Seeley, 1997), and more severe substance abuse problems (Thompson, Riggs, Mikulich, and Crowley, 1996) than offenders without comorbid symptoms.

One study found that depressive disorders are prevalent among juvenile offenders with conduct disorder diagnoses (McManus, Alessi, Grapentine, & Brickman, 1984). The authors reported that while all 40 male juvenile offenders in the sample met criteria for conduct disorder, only six subjects were assigned conduct disorder as their primary diagnosis. There was a high rate of mood disorders, including 10% who were experiencing an active major depressive disorder, 7.5% who were experiencing a major depressive disorder in remission, and 15% who were diagnosed with dysthymic disorder.

Several studies have demonstrated that youth with conduct disorder and attention deficit hyperactivity disorder (ADHD) have more severe conduct problems than youth with just a conduct disorder diagnosis. One study examined this interaction among a sample of juvenile offenders and found that offenders with comorbid conduct disorder

and ADHD had an earlier age of first arrest and more total arrests than offenders without ADHD symptoms (Forehand, Wierson, Frame, & Kempton, (1992).

In a study of the relationship between symptoms of conduct disorder, ADHD, and substance problems, Thompson, Riggs, Mikulich, and Crowley (1996) sampled youth enrolled in a residential program for substance abuse. The authors administered the Diagnostic Interview Schedule for Children (DISC) to 171 adolescent boys. Substance abuse diagnoses were made based upon data collected from the Composite International Diagnostic Interview (CIDI-SAM; Cottler, Robins, & Helzer, 1989), and the Comprehensive Addiction Severity Index (CASI; Meyers, 1991). The authors reported that for boys with conduct disorder, the presence of ADHD symptoms was associated with more severe involvement in substance use, higher rates of anxiety and depression, more severe conduct disorder symptoms, and earlier onset of conduct disorder symptoms than for those boys with fewer or no ADHD symptoms.

Another study of juvenile offenders with conduct disorder examined the prevalence rates for co-occurring personality disorders. Participants were 100 juvenile offenders (21 females and 79 males) between the ages of 11 and 17. Researchers administered the Diagnostic Instrument for Children and Adolescents (DICA) to determine the prevalence of conduct disorder. Researchers used the Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II) to determine if subjects met the diagnostic criteria for any of 13 personality disorders. Interviews were completed by a psychiatrist over the course of one hour. The authors reported that of the 87 subjects who met DSM-III-R criteria for conduct disorder, 78 met criteria for at least one personality disorder. The most common personality disorder was Antisocial (75). Other common

personality disorders found among this sample were Borderline (27), Paranoid (17), Passive-aggressive (14), Narcissistic (8), and Dependent (7). These results provide evidence of high rates of personality disorder symptoms among offenders with conduct disorder. It appears that evaluations of juvenile offenders need to assess for symptoms of mental disorders as well as for personality characteristics that may indicate the presence of maladaptive personality styles and traits. Thus, while the assessment of conduct disorder as a stand alone diagnosis may be of limited use to juvenile facilities due to the high prevalence of conduct disorder symptoms in this population, it appears very important for facilities to be proficient in the assessment of conduct problems and co-existing mental health problems, such as symptoms of mood disorders, ADHD, substance abuse disorders, and personality disorders.

Mood disorders. Mood disorders such as depression and dysthymia appear to be prevalent among juvenile offenders. McManus, Alessi, Grapentine, & Brickman, (1984) reported a high rate of mood disorders among a sample of 40 male juvenile offenders. The authors reported that 10% of this sample were experiencing an active major depressive disorder, 7.5% were experiencing a major depressive disorder in remission, and 15% met diagnostic criteria for dysthymic disorder. Another study that confirms the importance of assessing for mood disorders among juvenile offenders was conducted by Chiles, Miller, & Cox (1979). These authors reported that 23% of 120 juveniles in a correctional setting met criteria for major depression. This sample was drawn from 120 juveniles (ages 13-15) incarcerated at a facility in the state of Washington. Offenders were classified as depressed or not depressed based upon a diagnostic interview and results from the Beck Depression Inventory.

One reason that the assessment of depression is particularly important within this population is that depression is associated with suicidal behavior. Rhode, Mace, and Seeley (1997) examined suicidal behavior among a sample of 60 adolescent delinquents in a secure detention facility. The authors conducted diagnostic interviews with subjects to determine the prevalence of mental health problems within this sample. The authors reported that suicide attempt rates were approximately twice as high for offenders who met the criteria for mental disorders than for those who did not. Suicide attempts were correlated with mood disorders and anxiety disorders. Additionally, among males suicide attempts were also associated with a higher rate of conduct disorder and oppositional defiant disorder.

Alessi, McManus, Grapentine, and Brinkman (1984) found that 68% of their sample of 71 juvenile offenders exhibited suicidal behavior in the previous year. Suicidal behaviors included suicidal ideation, intent to commit suicide, and previous suicide attempts. The authors noted that suicidal behavior was nearly twice as common as a clinical diagnosis of a mood disorder (32%) among this sample of juvenile offenders. This suggests that some youth evidenced suicidal behavior, but did not evidence the degree of depressive symptoms that would qualify for a DSM-III diagnosis of a mood disorder. This suggests that assessments of juvenile offenders must take into account symptoms of depressive disorders and not overlook offenders who do not meet the criteria for a diagnosis according to DSM standards. More importantly, the assessment of juvenile offenders must be able to assess for suicide, not just depression, as suicide can be seen in a broader number of cases.

Substance abuse. Substance abuse has been identified as one of the strongest factors for violent behavior (Loeber, 1990). Substance abuse disorders are prevalent among juvenile offenders and have been identified as one of several predictors for chronic offending (Jones, Harris, Fader, & Grubstein, 2001). Neighbors, Kempton, and Forehand (1992) studied a sample of 111 juvenile delinquents. The authors conducted diagnostic interviews with all subjects and subsequently placed them into one of three groups related to substance use: no substance use, alcohol/marijuana abuse, and polysubstance abuse. The authors reported that a diagnosis of conduct disorder was more likely for youth with substance abuse diagnoses than for those who were placed in the no substance use group. Similarly, the symptoms for conduct disorder, anxiety, and depression increased with a diagnosis of substance abuse. For offenders diagnosed with polysubstance abuse, the probability of having more than one psychiatric diagnosis was over 50%.

Similar to the diagnosis of conduct disorder, it appears that substance abuse diagnoses among juvenile offenders are also likely to be accompanied by additional mental health problems. For example, incarcerated juveniles with a diagnosis of externalizing disorders such as conduct disorder or oppositional defiant disorder frequently have comorbid substance abuse disorders (Hovens, Cantwell, & Kiriakos, 1994). Lexcen and Redding (2000) reported that among juvenile offenders, conduct disorder, attention deficit-hyperactivity disorder, and depression are all associated with substance abuse. Grilo, Fehon, Walker, and Martino, (1996) studied 105 adolescent referrals to the evaluation and crisis intervention unit of a psychiatric hospital. The hospital's multidisciplinary treatment team of clinicians reviewed each patient's history

and presenting data and determined whether they met criteria for a substance use disorder according to DSM-III-R criteria. The authors reported that adolescents on an inpatient unit with substance use disorders showed significantly higher levels of delinquent predisposition, unruliness, and social insensitivity as measured by the MACI, than youth without substance abuse disorders.

In the Milin et al., (1991) study, the authors found that among offenders without substance abuse disorders, 90% met criteria for conduct disorder, 43% met criteria for oppositional disorder, and 33% for a subset of conduct disorder they refer to as aggressive conduct disorder. Among offenders with substance abuse disorders, the rate for conduct disorder was similar (91%), while the rate for aggressive conduct disorder (68%), oppositional disorder (58%), ADD (23%), and major depression (18%) were all higher than offenders without substance abuse disorders. These results point to the importance of assessing substance abuse problems as well as co-occurring problems such as conduct disorder, ADHD, and depression.

Offense Characteristics

In addition to examining differences among juvenile offenders according to mental health symptoms, this study also examined differences among offenders who are grouped by offense history. The three groups that were examined are violent offenders, offenders with sexual offense histories, and chronic offenders.

Violent juvenile offenders. Many studies of juvenile offenders classify youth as violent or nonviolent based upon their offense histories. For example, the OJJDP differentiates offenders who committed property crimes (burglary, auto theft, breaking and entering) and those who committed person crimes (assault, rape, battery). This study

will compare violent offenders with nonviolent offenders based upon a review of offense history.

Juveniles with histories of violent behavior frequently are labeled with a conduct disorder diagnosis. However, as discussed previously, such a diagnosis encompasses behavior that may not be violent, such as defiance towards rules and authority, property destruction, and conning or manipulation of others (DSM-IV). Facilities, however, may be more concerned with offenders' violent behavior than a more general descriptor such as conduct disorder. One reason for this is the prevalence of violent behavior while incarcerated. A 1993 survey of juvenile placements across the country estimated that juvenile offenders injured approximately 6,900 staff in a span of one year with aggressive and violent actions (Allen-Hagen, 1993).

A means of further evaluating offender's violent behavior has been developed allowing researchers to classify violent episodes into instrumental and reactive categories (Cornell et al., 1996). Cornell et al., (1996) developed a procedure for classifying youth as instrumental or reactive based upon the presence of one or more instrumental acts in their offense history. Instrumental violence is considered to be a violent act committed to attain personal goals, while reactive violence is a violent act committed in the course of a conflict or dispute. Although juveniles prone to violent behavior may engage in both reactive and instrumental violence at different times, instrumental violence is associated with psychopathy, a personality syndrome characterized by minimal empathy, egocentricity, and callous behavior. Psychopathy has been shown to be a predictor of violent crime, recidivism, and treatment failure in adults (Hare, 1996). Thus, a distinction between juvenile offenders with histories of nonviolence, reactive violence, and

instrumental violence may be useful for facility clinicians. This study will utilize this procedure to test the validity of a self-report instrument in classifying offenders by different types of violent behavior.

Juvenile sexual offenders. Juvenile sexual offending accounts for an estimated one-fifth of all rapes committed in the United States, and nearly one-half of all cases of child molestation (Sickmund et al., 1997). Sexual offenders are problematic for juvenile justice facilities due to high rates of recidivism and poor response to treatment interventions. In one study in which sexual offense recidivism was measured by follow up arrest records, researchers found that sexual offenders completing individual therapy still had recidivism rates of 75% for sexual offenses, and 50% for non-sex offenses (Henggeler, Borduin, Blaske, & Stein, 1990).

Another characteristic of sexual offenders that poses problems for juvenile facilities is high rates of comorbid mental health problems. Research on adolescent sexual offenders has revealed that a common characteristic of sexual offenders is the presence of behavioral health problems. One study reported that up to 80% of adolescent sexual offenders have some diagnosable psychiatric disorder (Kavoussi, Kaplan, & Becker, 1988).

Another study attempted to identify psychopathology and personality traits unique to sexual offenders to aid in the classification of youths with and without sexual offense histories (Losada-Paisey, 1998). The sample included 51 males (ranging in age from 13 to 17) committed to a state facility. Twenty-one offenders were classified as sex offenders based upon previous adjudication for charges of Sexual Assault against a minor, risk of injury, unlawful restraint, or sexual assault. Non-sex offenders were

incarcerated for a variety of offenses, which included possession of narcotics, assault, threatening, burglary, and larceny. The author reported that sexual offenders had distinguishing personality characteristics as measured by the MMPI-A. Four MMPI-A scales (3, 4, 7, and 8) were able to correctly classify 71% of the sexual offender group, and 77% of non-sexual offenders, resulting in a 75% overall classification rate. This study suggests that a self-report inventory can successfully differentiate between adolescent sex offenders and non-sex offenders. These findings may assist in the assessment and treatment of sexual offenders at juvenile facilities.

Chronic juvenile offenders. Chronic juvenile offenders are often the focus of juvenile justice policy initiatives targeting the most frequent users of juvenile justice resources. Policy regarding juvenile offenders involves focusing resources on the juveniles most likely to offend and re-offend in the future (Jones, Harris, Fader, & Grubstein, 2001). This approach was made popular by the findings of a study of chronic offenders in California (Kurz and Moore, 1994). This study introduced the "8 percent problem", a phrase used to describe the small proportion of juvenile offenders that was responsible for 55% of probation referrals at the California Probation Department. As a result of this finding, one trend in juvenile justice is to identify youth most likely to be chronic offenders and target them for increased intervention and prevention services. Kurz and Moore (1994) found that interventions that target potentially chronic offenders and their families can reduce subsequent rates of re-offending.

It would be important to learn more about the differences between juvenile offenders with chronic rates of offending and those with shorter offense histories. Of all youth committed to Virginia juvenile corrections facilities in 1998, 76% were being

incarcerated for the first time, while 17% were committed for the second time, and 6% for the third (McGarvey & Waite, 1998). In the same year, 31% of youth committed to Virginia correctional facilities had committed a felony prior to the offense leading to their incarceration. This study will examine the personality characteristics and symptoms of mental health problems among chronic offenders and offenders with shorter offense histories.

Summary of Offender Problem Areas

The literature on juvenile offenders suggests that multiple mental health problems are prevalent among this population. Conduct disorder appears to be the most prevalent mental disorder among juvenile offenders, and has been shown to frequently co-occur with multiple mental health problems including ADHD, substance abuse, mood disorders, and personality disorders. Other mental health problems are common among juvenile offenders, including symptoms consistent with depression, suicidal behavior, anxiety disorders, and substance abuse. A review of the literature regarding mental health problems among juvenile offenders found consistent references to high rates of comorbidity for each diagnostic category, suggesting complexity in the assessment of this population and the need for accurate differential diagnosis.

Chapter 2: Assessment of Juvenile Offenders

Juvenile facilities need to be concerned with the accurate assessment and treatment of mental health problems among young offenders for several reasons. One reason is that facilities are legally and ethically obligated to provide incarcerated youth with medical and mental health services. The constitutional rights of incarcerated juveniles include the identification of both medical and psychiatric problems, as well as the provision of adequate treatment by qualified professionals (Costello & Jameson, 1987). National associations such as the American Psychological Association, and the National Commission on Correctional Health Care have developed ethical standards for the minimum requirements of mental health services in correctional settings, each of which emphasize the importance of mental health screening and evaluation that should be performed by qualified personnel as part of the facility's intake process (Metzner, Miller, and Kleinsasser, 1994).

Another reason for juvenile correctional authorities to be concerned with effective assessment and treatment of mental health problems is the negative outcome associated with them in a juvenile offender population. Studies have shown that mentally disordered youth have a higher rate of recidivism than non-disordered youth (Cottle, Lee, & Heilbrun, 2001), and that diagnosis of a mental disorder is a strong predictor of chronic youth offending (Jones, Harris, Fader, & Grubstein, 2001). Additionally, juveniles with psychological problems have been shown to be more likely to assault peers and staff when incarcerated than juveniles without identified psychological problems in correctional settings (Wierson, Forehand, & Frame, 1991; Dicataldo, Greer, & Profit, 1995). Another concern to juvenile facilities is the increased incidence of suicide among

young offenders with mental health problems (Memory, 1989; Rhode, Mace, & Seeley, 1997). Often psychopathology goes undetected in correctional settings, increasing the likelihood of recidivism, offense escalation, and institutional violence among this subset of youth offenders (Redding, 2000). It is clear that identification of mental health problems is an integral step towards reducing the risk of these negative outcomes.

Justice For Juveniles (JFJ) is an initiative that advocates for the mental health needs of juvenile offenders (Cellini, 2000). JFJ conducted a community assessment in which they interviewed state and local authorities about current policies and programs they have in place for this population. The study sampled communities in 15 counties and 9 states. One of the key findings was the inadequacy of screening and assessments for youth involved in the juvenile justice system. Many communities reported a lack of routine screening or assessments and acknowledged that most youth with mental health and/or substance abuse problems are often not identified until their problems result in a crisis that demands attention. An effective instrument will help identify these offenders in need of mental health treatment before such problems arise during incarceration.

Although the JFJ report suggests a lack of consistent screening and assessment protocols for juvenile justice facilities, some facilities provide standard assessment protocols for juveniles at intake to correctional settings. For example, the Reception and Diagnostic Center (RDC) in Bon Air, Virginia conducts comprehensive assessments of offenders that involve clinical interviews, observation in the social milieu, review of offense history information, and psychological testing that includes standardized intelligence and personality measures. The use of standardized instruments has several advantages for facilities and the youth they serve. Such instruments provide an objective

measure of a range of mental health problems among youth offenders, and provide additional information to supplement the clinical judgment of clinicians.

Another benefit of self-report inventories is their ability to address the problem of inaccurate or untruthful responding in clinical interviews. Many inventories have validity indices that may help identify invalid or inconsistent response styles. While such indices are not infallible, they do provide an objective measure of invalid responding that clinical interviews do not.

Finally, self-report inventories may also tap into personality characteristics and pathology that could go unnoticed in a clinical interview. Clinicians in youth correctional facilities who conduct screening interviews are likely to assess for symptoms of major psychopathology that would most significantly impact the facility, such as psychosis and suicidal ideation. Clinicians at such facilities, however, may benefit from access to information about offender's personality characteristics or areas of emotional or behavioral problems for the purposes of treatment planning or making placement decisions. This information may not be gained in a clinical interview format. Therefore, a personality inventory that can assess for symptoms of significant psychological distress as well as for personality characteristics would be most useful for juvenile facilities.

Most of the research on prevalence rates among juvenile offenders utilized diagnostic interviews to measure mental health problems (DICA, DISC etc). Some research utilized self-report personality inventories such as the MMPI-A to screen for a specific mental health problem (Cashel, Ovaert, & Holliman, 2000; Losada-Paisey, 1998). I examined the utility of a self-report personality inventory in the assessment of the most common mental health problems among juvenile offenders. Such an instrument

will need to cover the broad range of symptoms and behaviors prevalent in this population. Furthermore, the inventory will need to be able to provide differential diagnostic information to aid clinicians in discriminating among complex symptom presentations.

Millon Adolescent Clinical Inventory

The Millon Adolescent Clinical Inventory (MACI) is a self-report inventory designed to assess personality styles and levels of psychopathology among adolescents in clinical settings. The MACI consists of 160 true-false items, and 31 clinical scales that are separated into four domains, Personality Patterns, Expressed Concerns, Clinical Syndromes, and Modifying Indices. The MACI was designed to assist mental health professionals in the identification, prediction, and understanding of a wide range of psychological difficulties that are typical of adolescents (Millon et al., 1993). Unlike some adolescent personality measures that were adapted from adult instruments, the MACI was developed specifically for the assessment of adolescents. The instrument requires a sixth grade reading level, and the items are written in the language of teenagers. Its 160-item length takes approximately 20 minutes for most adolescents to complete. These features make the MACI especially appropriate for use with a juvenile offender population.

The MACI is the replacement for the Millon Adolescent Personality Inventory (MAPI). The MAPI is a 150 item true-false measure that was first published in 1982 to help identify a wide range of psychological attributes in both normal adolescents and those receiving assistance in a clinical setting. The MAPI consisted of two forms, a clinical form, the MAPI-C, for use with adolescents in a diagnostic or treatment setting at

the time of administration, and a guidance form, the MAPI-G that was designed for use by guidance counselors to better assist them in understanding student's personalities and identifying those students who might benefit from additional psychological assessment (Millon, Millon, & Davis, 1993). The MAPI's normative sample consisted of both normal and clinical populations. This feature may have increased the measure's flexibility in its use with both clinical and non-clinical adolescents, but it also resulted in a lack of precision when it was used exclusively with clinical populations. In seeking to develop an instrument solely for clinical purposes, Millon, revised the MAPI in several significant ways resulting in the MACI. As a result of the reformulation, the MACI has 14 new scales and reconstituted old scales to better conform to the psychological nomenclature consistent with DSM-IV, to accurately reflect the concerns of clinicians who commonly work with adolescents, and to encompass the developing aspects of Millon's theory of personality (McCann, 1997).

Millon's revision of the MAPI began with a three-stage validation process for selecting the items and scales to be included in the MACI. Each item on the MACI had to pass through each stage of validation sequentially in order to be retained. The first of three stages was the theoretical-substantive stage where Millon included items into the selection pool that reflected his theory of personality and psychopathology, as well as the expressed concerns and clinical syndromes deemed relevant by clinicians who work with adolescents. A group of judges reviewed the content of each item, and accepted or rejected items using a rational approach. This process resulted in a pool of 331 items, including all 150 MAPI items and 181 new items.

The next phase in item selection and scale construction was internal-structural. In this stage, items were tested to ensure good internal consistency, adequate endorsement frequencies, and correlations between item responses and scores on individual scales. The items were also assessed in terms of their ability to produce scales that are stabile and homogeneous, and whether they correlated with theoretically relevant scale constructs (McCann, 1999). The final step of MACI development was the external-criterion stage in which items and scales were evaluated in terms of their correlation with external measures of the particular construct being measured. In this stage, clinicians from around the country administered the MACI to adolescents who comprised the normative sample. Individual MACI scales were compared to a clinician's diagnostic formulations of specific patients who manifested a particular disorder.

Only items that survived all three validation stages were retained, a process that pared the original 331 items down to the 160 that comprise the MACI. Only 49 of the original 150 MAPI items were retained, while 111 new items were added. The 160 items form the basis for 31 scales separated into four domains, Personality Patterns, Expressed Concerns, Clinical Syndromes, and Modifying Indices. The scales that comprise Personality Patterns are modeled after specific personality disorders from the DSM-IV. These 12 scales include Introversive, Inhibited, Doleful, Submissive, Dramatizing, Egotistic, Unruly, Forceful, Conforming, Oppositional, Self-Demeaning, and Borderline Tendency. A list of scales and their relevant DSM-IV Axis II disorder can be found in Table 2.

The Expressed Concerns domain contains eight scales that focus on adolescents' feelings and attitudes about a variety of problematic issues for many troubled adolescents

(Millon et al., 1993). They include Identity Diffusion, Self-Devaluation, Body Disapproval, Sexual Discomfort, Peer Insecurity, Social Insensitivity, Family Discord, and Childhood Abuse. The third domain is Clinical Syndromes, which was developed to relate to specific manifestations of psychopathology as opposed to adolescent's perceptions and feelings as measured in the Expressed Concerns scale. The scales that comprise the Clinical Syndromes domain are most reflective of Axis I disorders as defined by DSM-IV. They include, Eating Dysfunctions, Substance Abuse Proneness, Delinquent Predisposition, Impulsive Propensity, Anxious Feelings, Depressive Affect, and Suicidal Tendency. The final domain is Modifying Indices, which provides a validity screen for administrators

The MACI's normative sample consisted of 1,017 adolescents who were administered the research form of the MACI (331 items). This sample was subdivided into three groups. The Developmental group consisted of 579 adolescents and two cross validation groups that consisted of 139 and 194 adolescents respectively. The normative sample included males and females between the ages of 13 and 19 who were involved either in active mental health treatment, or were undergoing assessment for emotional and behavioral problems. This group was drawn nationwide from a variety of treatment settings, including outpatient mental health facilities, private practice settings, inpatient psychiatric and general medical units, and residential treatment settings. The MACI normative sample included adolescents of different ethnicities, including Caucasian (79%), African American (8%), Hispanic (6%), Native American (3%), and Asian (less than 1%)(McCann, 1999).

Another difference from most personality inventories is the MACI's use of base rate scores. Rather than assuming that all clinical syndromes have similar distributions among adolescent populations, the MACI employs age, gender, and prevalence rate data in converting raw scores into base rate scores. Thus, each base rate score reflects a different percentile value for each scale. Base rate scores for each scale range from 0 to 115. Base rate scores below 60 indicate that the particular characteristic being measured is not a problem for the adolescent. When base rate scores are at or above 75, the characteristic or trait being measured is considered to be present and clinically significant. Base rate scores at or above 85 suggest that the characteristic being measured is prominent and highly clinically significant (Millon et al., 1993).

The use of base rate scores enhances the MACI's ability to differentially diagnose adolescents presenting with multiple mental health symptoms. Base rate scores were developed by comparing how well subjects match up with other adolescents with other diagnoses. Most personality inventories are developed by comparing "normal" subjects with subjects who have a particular disorder. By contrast, the base rate scores enable the MACI to refine a clinical symptom presentation, and differentiate between types of disorders among clinical samples, rather than to solely determine the absence or presence of disorder. This feature will be especially useful in assessing a juvenile offender population, which frequently presents with a variety of mental health problems.

Jesness Inventory

The Jesness Inventory Classification System is a self-report measure of personality that was designed to classify offenders into one of nine personality subtypes (Jesness, 1988). The classification system is based upon an interpersonal maturity scale,

the I-level system that was originally developed to classify juvenile delinquents. There are nine I-Level subtype designations: Unsocialized aggressive, Unsocialized passive, Immature conformist, Cultural conformist, Manipulator, Neurotic acting out, Neurotic anxious, Situational, and Cultural Identifier. Classification is based upon individual's responses to the Jesness Inventory. The Inventory is comprised of 155 true-false items that yield T-scores on eleven personality/attitude scales (Alienation, Asocial Index, Autism, Denial, Immaturity, Manifest Aggresion, Repression, Social Anxiety, Social Maladjustment, Value Orientation, and Withdrawal). One major difference between the MACI and the Jesness Inventory is that MACI scales were developed to correspond with DSM-IV Axis I and Axis II diagnoses as well as with problem areas common to juvenile offenders, such as suicidality and sex offending. Although the Jesness was developed specifically to classify juvenile delinquents, its I-Level subtype designations do not correspond with specific DSM-IV diagnoses.

The Jesness has been used in several studies involving juvenile offenders. Martin (1981) used the Jesness Inventory to discriminate between delinquent and non-delinquent youth. The author reported that when comparing these two groups, delinquent youth had more elevated scale scores on the Denial, Asocial Index, Socially Maladjusted, Manifest Aggression, Autism, and Value Orientation scales than non-delinquent youth. Other studies addressed the issue of how inventories such as the Jesness can be useful with an incarcerated sample of adolescents. Sorensen & Johnson (1996) used the Jesness and MMPI to classify juvenile delinquents into categories. Cluster analysis was used to group 191 incarcerated juveniles into five subtypes. Each subtype corresponded with different behavior characteristics of juvenile offenders. For example, the authors reported that the

Alienated cluster was marked by social alienation and sensation seeking with little reported emotional distress, and the Angry-Suspicious subtype reflected considerable conflict with authority, suspiciousness, thrill-seeking behavior, and anger. In a second study, the authors replicated these findings with a smaller sample of incarcerated adolescents.

The Jesness Inventory was not found to aid in discriminating offenders with violent behavior while incarcerated. Hooper and Evans (1984) examined whether the Psychological Screening Inventory (PSI; Lanyon, 1978) and the Jesness Inventory could identify youths most likely to act out disruptively while incarcerated. The sample was drawn from 70 males placed in a state juvenile treatment facility for offenses ranging from rape, homicide, burglary, theft, and status offenses. Youth were placed in the acting out category based on records review of disruptive behavior while incarcerated. The authors reported that scales of the PSI and a measure of intelligence (Shipley-Hartford Scale) correctly classified 75% of those offenders whose level dropped for committing a serious aggressive act such as aggravated assault, and 91% of those whose level was dropped for less serious events such as fighting or carrying a knife. The authors concluded that the Jesness Inventory added little discriminatory power in the prediction of aggressive behavior while incarcerated.

MAYSI

The Massachusetts Youth Screening Instrument-2 (MAYSI-2; Grisso & Barnum, 2000) is a 52 item true-false, self-report inventory developed for use by juvenile justice facilities to identify youth in need of immediate mental health services. The MAYSI-2 has seven scales: Alcohol/Drug Use, Angry/Irritable, Depressed-Anxious, Somatic

Complaints, Suicide Ideation, Thought Disturbance, and Traumatic Experiences. The MAYSI-2 was developed to identify youths who may be experiencing symptoms of distress, such as depressed mood, or manifest feelings or behaviors, such as suicide potential, that would require immediate intervention by facility staff. The instrument appears most appropriate as an initial screen aimed at identifying youth at intake who may require emergency intervention for emotional problems requiring immediate response such as suicidal ideation or psychotic thought process.

The authors reported internal consistency coefficients for MAYSI-2 subscales ranging from .61 to .86. Concurrent validity was measured by comparing the 1,052 youths who completed the MAYSI-2 in Massachusetts detention or assessment centers with 749 youth (551 boys, 198 girls) who also completed the MACI and the Youth Self Report (Achenbach, 1991). The authors hypothesized that four MAYSI-2 scales were conceptually similar to four MACI scales. Correlations for male respondents were, Substance-Abuse Proneness and Drug/Alcohol Use ($r = .64$), Suicidal Tendency and Suicide Ideation ($r = .61$), Depressive Affect and Depressed-Anxious ($r = .52$), Impulsive Propensity and Angry-Irritable ($r = .45$). The authors reported relatively high rates of subjects scoring above the cutoff scores provided by the MAYSI-2 to indicate clinical significance. While the MAYSI-2 correlated significantly with four theoretically similar MACI scales, there are fundamental differences between the measures. For example, the MAYSI-2 does not contain validity scales to assess for inconsistent or inaccurate response styles. Additionally, the scales of the MAYSI-2 do not provide information relating to specific psychiatric diagnoses, or personality styles.

MMPI-A

The Minnesota Multiphasic Personality Inventory (MMPI) is a 550-item personality inventory that is widely used with adults. The MMPI is a true-false self-report inventory that measures personality and psychopathology of adolescents. The MMPI-A is an adolescent version of the MMPI that was developed by Butcher et al. (1992). Pena, Megargee, and Brody (1996) tested the MMPI-A's ability to discriminate between delinquent and non-delinquent adolescents, and compared these results with patterns found in previous MMPI studies on delinquency. The authors studied the MMPI-A profiles of 162 adolescent males at a residential training school for youth adjudicated by juvenile courts for criminal offenses, and compared them to 805 non-delinquent males from the MMPI-A standardization sample. The authors hypothesized that significant differences would be found on 17 of 38 MMPI-A validity, clinical, supplementary, and content scales. The authors reported that twelve hypotheses met criteria for statistical and clinically meaningful differences. For example, the authors reported that scales 4 (Psychopathic Deviate), 8 (Schizophrenia), and 9 (Hypomania) were significantly higher for delinquent youth then non-delinquent youth. This supports the hypothesis that the MMPI-A can assess for personality differences between delinquent and non-delinquent youth.

Glaser, Calhoun, & Petrocelli (2002) examined how the MMPI-A could assess for personality differences within an offender population. The authors examined whether the MMPI-A could detect personality differences among three types of offenders, those who committed a crime against person, crime against property, and drug/alcohol related crime. Seventy-two male juvenile offenders completed valid MMPI-A profiles. The subjects

ranged in age from 13 to 17, and all were detained in a juvenile detention center. The authors reported that juvenile offenders with different offense histories had different personality characteristics as measured by the MMPI-A. For example, juvenile offenders with elevations on Scale 1 (Hypochondriasis) and Si-2 (Social Avoidance), are less likely to develop alcohol or drug problems, and are more likely to engage in property offenses than offenders without these elevations. In addition to group differences in MMPI-A profiles, the authors also reported that selected MMPI-A scales successfully classified 79.2% of the cases into the appropriate offense category. These results suggest the MMPI-A can classify offenders based upon broad categorizations of offense characteristics.

A recent study evaluated the use of the MMPI-A in identifying PTSD in a sample of 60 incarcerated males who ranged in age from 13 to 18. The authors utilized the PTSD reaction index, a 20-item self-report inventory to classify offenders into a PTSD group (n=36), and a non-PTSD group (n=24). The authors reported significant differences between the two groups on mean MMPI-A scores for scales F, 6, 8, and 9. Additionally, MMPI-A scales 4, 6, 8, and 9 effectively classified offenders into the correct group with an accuracy rate of 75% for offenders in the PTSD group, and 75% for offenders in the non-PTSD group (Cashel, Ovaert, & Holliman, 2000).

Losada-Paisey used the MMPI-A to investigate the relationship of personality characteristics of juvenile sex offenders and juvenile offenders without sexual offense histories. The author selected 51 males from a population of 250 juvenile offenders committed to a state facility in Connecticut based upon offense history. The participants were 13 to 17 years of age and all were diagnosed with conduct disorder upon admission

to the facility. Twenty-one offenders were classified as sex offenders based upon previous adjudication for charges of Sexual Assault against a minor, risk of injury, unlawful restraint, or sexual assault. Non-sex offenders were incarcerated for a variety of offenses, which included possession of narcotics, assault, threatening, burglary, and larceny. The authors reported that four MMPI-A scales, Hysteria, Psychopathic Deviate, Psychasthenia, and Schizophrenia, were able to correctly classify 71% of the sexual offender group, and 77% of non-sexual offenders, resulting in a 75% overall classification rate. Thus, some MMPI-A studies have demonstrated the measure's validity as an assessment tool with a juvenile offender population, from differentiating between offenders and non-offenders and discriminating between offenders based upon offense history (sex offenders) and specific psychopathology (PTSD). The present study will examine the utility of the MACI, a shorter self-report measure that was developed specifically for use with adolescents.

MACI Research

The MACI development project attempted to validate the MACI items and scales (Millon et al., 1993). The cross-validation samples previously described were used to validate MACI scales. Each participating clinician completed two phases of research for adolescent clients in the normative sample. In the first phase, clinicians were presented with brief descriptions of the scales that closely approximate the current MACI scales, personality patterns, expressed concerns, and diagnostic categories. These scale descriptions differed somewhat from current MACI scales because of changes or subtractions made later in scale development. For example, the ten personality pattern scales presented to clinicians included Introverted, Inhibited, Cooperative, Sociable,

Confident, Unruly, Forceful, Respectful, Negative, and Sensitive. The Doleful and Borderline Tendency scales were not represented, and several of those included were later renamed (i.e., Cooperative to Submissive, Sociable to Dramatizing, Confident to Egotistic, Respectful to Conforming, Negative to Oppositional, and Sensitive to Self Demeaning). Similar to personality patterns, both expressed concerns and diagnostic categories correspond to current MACI scales, but were changed somewhat for the final version of the MACI. Additionally, one expressed concern scale, academic concerns, was dropped from the time of validation and final form, and four clinical syndrome scales were combined to form two (Bulimia and Anorexia to Eating Dysfunctions; Alcohol and Drug Categories to Substance Abuse Proneness) (McCann, 1997).

Correlation coefficients were computed between MACI base-rate scores and clinician judgments. Clinicians were asked to rate which personality patterns most closely approximated their clients. They were also asked to list the second best descriptor. The procedure was repeated for Expressed Concerns and Clinical Syndromes. Millon et al., (1993) reported that 14 of 25 coefficients were found to be statistically significant ($p < .05$) with a range of .00 for Identity Diffusion, and .43 for Childhood Abuse. The largest coefficient among personality patterns was Inhibited and Forceful ($r = .27$). The largest for Expressed Concerns and Clinical Syndromes were Childhood Abuse ($r = .43$) and Depressive Affect ($r = .37$) respectively.

A second cross-validation sample (Sample C) utilized a slightly different format. In this study, clinicians were asked to rate adolescents on personality patterns scales 1 through 8B (including Doleful. Borderline Tendencies was dropped from analyses). Clinicians rated adolescent's first and second most salient characteristics for expressed

Concerns and Clinical Syndromes similar to the format for Sample B. Twenty of twenty-four coefficients were statistically significant ($p < .05$). Personality pattern coefficients ranged from .02 (Oppositional) to .28 (Forceful). The highest coefficients for Expressed Concerns and Clinical Syndromes were Social Insensitivity (.39) and Substance Abuse Proneness (.52) respectively (Millon et al., 1993).

The second phase of validity testing was to compute correlation coefficients between MACI scores and scores from collateral test instruments that purport to measure similar constructs; the Eating Disorder Inventory-2, the Beck Anxiety Inventory, Combined Beck Depression Inventory/Hopelessness Scale, and the Problem Oriented Screening Instrument for Teenagers. Clinicians administered the two instruments that best fit their initial diagnosis. Correlation coefficients for collateral instruments and related MACI scales were relatively strong. For example, correlations between MACI scale AA (Eating Dysfunctions) and scores on Desire for Thinness and Body Dissatisfaction measures on the EDI-2 were .75 and .88. Correlations between MACI scale FF (Depressive Affect) and scores on the BDI and BHS were both .59 (Millon et al., 1993).

There have been several research studies supporting the utility of the MACI as a valid assessment tool with a variety of populations and psychopathology. Murrie and Cornell (2000) investigated the MACI's ability to assess psychopathy in a sample of 90 adolescents on an inpatient psychiatric unit. The authors found that six MACI scales, Substance Abuse Proneness ($r = .47$), Unruly ($r = .43$), Delinquent Predisposition ($r = .41$), Forceful ($r = .38$), Impulsive Propensity ($r = .34$), and Social Insensitivity ($r = .29$) correlated significantly with a measure of psychopathy, the revised Psychopathy

Checklist (PCL-R). The PCL-R is a 20-item measure completed by a clinician based upon a comprehensive interview with the subject, and a review of clinical records and/or offense history. In a previous study addressing the efficacy of a self-report instrument measuring psychopathy, Harpur, Hare, and Hakistan (1989) found that MMPI subscales Psychopathic Deviate and Hypomania were correlated with PCL total scores ranging from .23 to .35. Murrie and Cornell reported that several MACI scales provided stronger correlations by comparison. In addition, the authors developed a psychopathy content scale using 20 MACI items determined to be conceptually linked to the construct of psychopathy which was found to correlate with the PCL-R even stronger than the individual scales ($r = .60$). In addition to correlations with the PCL-R, the authors found that MACI scales were useful predictors of psychopathy, with the psychopathy content scale most effective in distinguishing between high and low psychopathy groups (classification rate = 83%, sensitivity = 85%, specificity = 81%).

Hiatt and Cornell (1999) examined the concurrent validity of the MACI in the assessment of depression among 88 adolescents at an inpatient psychiatric facility. The authors used three criteria for depression; a) patient's discharge diagnosis as determined by staff psychiatrists, b) the Children's Depression Inventory, a 27-item self-report measure of depression, and c) staff judgments of patient's suicidality after admission to the hospital. The authors found that two MACI scales, Doleful Personality and Depressive Affect, were positively correlated with CDI scores (.67 and .77 respectively). The same scales were found to be moderately predictive of a discharge diagnosis of depression. Using a MACI cutoff score of 75 to indicate depression, the Doleful Personality score had an overall classification accuracy of 59%, while the Depressive

Affect scale had an overall classification accuracy of 57%. Using the same cutoff score, the Suicidal Tendencies scale was found to have a classification accuracy of 64% when used to predict patients who were placed on suicide precautions while hospitalized. It is not clear how the MACI's assessment of depression in a psychiatric sample would differ from a juvenile offender sample. No studies were found addressing the assessment of depression among juvenile offenders with the MACI.

Velting, Rathus, & Miller (2000) used the MACI to compare the personality profiles of adolescents with and without a history of previous suicide attempts. The authors selected 49 patients (10 males and 39 females) admitted to an outpatient mental health facility. Participants completed a suicide survey (Harkavy-Asnis Suicide Survey; Harkavy, Friedman, and Asnis, 1989) and were categorized as "attempters" if they responded positively to one survey item, and as "non-attempters" if they responded negatively to the item. The authors reported that "attempters" presented with more severe overall levels of personality dysfunction than "non-attempters", and obtained significantly higher scores on the Forceful and Borderline Tendency scales and lower scores on the Submissive and Conforming scales. This study's outcome criterion was limited to a single item on a self-report measure thus limiting its generalizeability. More information on the MACI's ability to assess for suicidality may be gained with a broader range of outcome measures such as interview data and review of incarceration and treatment records.

The MACI was utilized in another study that compared 105 adolescents on an inpatient psychiatric unit both with and without substance use disorders (Grilo, Fehon, Walker, & Martino, 1996). Patients were categorized as having Substance Use Disorders

(SUD) or not having Substance Use Disorders based upon presenting information at intake and a review of each patient's history. Determinations were made by a multidisciplinary team of clinicians at the psychiatric facility. By this criterion, 44 patients were placed in the SUD group, and 61 were placed in the non-SUD group. Fifty-six percent were female and forty-four percent were male. Subject's ages ranged from 12-20 years with a mean age of 15.7. The authors found that MACI scales were statistically different for SUD and non-SUD subjects in this psychiatric sample. Theoretically related MACI scores were associated with a clinical diagnosis of SUD. Clinical diagnosis is one measure of SUD that does not have known reliability. Positive associations with alternative measures of outcome criteria such as a standardized measure of substance use would strengthen these findings.

Romm, Bockian, and Harvey (1999) investigated the factor structure of the MACI among 251 adolescents referred for placement at a residential treatment facility. Participants were between the ages of 13 and 19. There were 160 male participants and 91 female participants who were referred for residential placement from a variety of sources, including inpatient psychiatric hospitals, hospital based residential treatment centers, school systems, the Department of Child and Family Services, community mental health clinics throughout the Chicago metropolitan area. The authors found that five factor-based prototypes were generated from the results. Factor 1 was the Defiant Externalizing dimension characterized by adolescents with multiple problems with authority, school figures, or their parents. Factor 2 represented Intrapunitive Ambivalents, whom the authors described as adapting to external stressors by internalizing problems rather than acting out. The primary mood disorder for this category was depression. The

third factor was Inadequate Avoidants, individuals that were reportedly extremely sensitive to painful experiences that may lead to avoidant behavior and undeveloped social skills. These subjects were reportedly often seen as shy, weird, or strange by others, and were found to have the highest level of disturbance on the MACI. The fourth factor is Self-Deprecating Depressives who were described as melancholy, fearful, and self-pitying. These individuals were described as socially awkward and unassertive in meeting their needs. The final factor type was Reactive Abused. These individuals were likely to have a history of abuse, but appeared as if they had little psychopathology according to their MACI profiles. Members of this subtype were considered to be unsuccessful in managing difficult feelings, and expressed anger and frustration when they were unable to cope.

Vitacco, Neumann, Robertson, & Durrant (2002) used the MAPI, the predecessor to the MACI, to examine the effects of personality traits on delinquent behavior. The authors administered the MAPI to 162 male adolescents adjudicated in the Mississippi youth court system. The authors categorized participants into low risk, high risk, callous, and impulsive groups based upon their scores on the Social Tolerance scale (used as a measure of callousness) and the Impulse Control Scale, (used as a measure of impulsivity). The authors compared these different groups of offenders on self-reported symptoms of psychopathology, self-reported antisocial and prosocial behavior, and number of days detained. The authors reported that the low-risk group, who scored below the clinical cutoff on MAPI scales measuring callousness and impulsivity, had significantly fewer days detained, reported lower rates of antisocial behavior, fewer

symptoms of psychopathology, and less problems with social conformity than groups who scored above the clinical cutoff on one or both scales.

A few studies utilized the MACI with a juvenile offender population. Salekin investigated the factor structure of the MACI in a sample of juvenile offenders. The author administered the MACI to 250 male (171) and female (79) youth who were referred to a juvenile court assessment center for a variety of offenses including property offenses, theft, and offenses against persons. The author performed separate factor analyses for Clinical Syndromes, Personality Patterns, and Expressed Concerns. He reported a two-factor solution for each analysis.

The two factors that emerged from the Clinical Syndromes scales included one that represented depressed mood, and one that represented psychopathic precursors. Both factors together accounted for 66.2% of the common variance. The two factors that emerged from the analyses of the twelve Personality Patterns scales included one that was weighted towards internalizing symptomatology, and a second that appeared to represent externalizing characteristics as represented by positive loadings on the MACI Forceful and Unruly scales. Factor I for the Expressed Concerns scales was determined to measure identity confusion, while Factor II provides a measure of social sensitivity. While this research is useful in reducing the MACI's 27 clinical scales into six distinct factors, more research is necessary to assess the replicability of this factor structure, and to explore the predictive validity of these factors with juvenile offenders.

Timmons-Mitchell et al. (1997) used the MACI as one means of identifying mental health problems among incarcerated adolescents. The authors administered the MACI to 119 male and 45 female offenders and found that in general, girls had more

elevated MACI scores than boys. Boys had base-rate mean scores that ranged from 16.44 (Eating Dysfunctions) to 79.78 (Delinquent Predisposition). Four scales had mean base rate scores greater than 75, the rate that at which a trait is considered clinically present, Delinquent Predisposition, Substance Abuse Proneness (75.86), Social Insensitivity (76.30), and Unruly (75.34).

Loper, Hoffschmidt, and Ash (2001) examined whether MACI scales previously associated with psychopathy were related to characteristics of a specific violent event. The sample included 42 males and 40 females incarcerated at a state juvenile corrections facility. Each participant was interviewed about a recent violent event. Based on interview data, subjects received a score on three criteria, instrumentality, emotional reactivity, and guilt/remorse. Boys had mean base rate scores that ranged from 16.71 (Eating Dysfunctions) to 79.61 (Delinquent Predisposition). Only two scales had mean base rate scores over 75, Social Insensitivity and Delinquent Predisposition. Girls had higher scores on MACI introversive, self-demeaning, and borderline features and were more likely to show clinical profiles of eating disorder, depressive affect, and suicidal tendency.

The authors reported that subjects whose interviews reflected high instrumentality and low remorse or guilt scored higher on MACI scales associated with psychopathy. One limitation the authors noted was their reliance on self-report data from a single violent event as their criterion measure of validity. It would be useful to explore the MACI's relationship with additional measures of offender's offense history that come from multiple sources of information rather than solely self-report data, such as records yielding information on offenders' history of violence, number of offenses, or status as a

sexual offender. Similarly, records data combined with clinician ratings and self-report rating scales could be used as criteria for the presence of psychopathology. Although some studies have utilized the MACI as a measure of a particular mental disorder (substance abuse, suicide attempts, depression), there has not been a comprehensive evaluation of the utility of the MACI in assessing mental disorders among a juvenile offender population.

Chapter 3: Goals of the Present Study

This study examined the utility of the Millon Adolescent Clinical Inventory for the assessment of male juvenile offenders. The present study attempted to answer the following research questions.

1. What is the MACI profile for juvenile offenders?
    a. How is this sample similar or different than the MACI scores of a sample of adolescents at an inpatient psychiatric hospital?
    b. How does this sample compare with the MACI scores of the normative sample?
    c. How do MACI profiles differ based on age or race of participant?
2. Is There a Distinctive MACI Profile Associated With Offense History Characteristics?
    a. Can the MACI distinguish between violent and nonviolent offenders?
    b. Can the MACI distinguish between sexual offenders and non-sexual offenders?
    c. Can the MACI distinguish between chronic and non-chronic offenders?
3. Do Juvenile Offenders With Mental Disorders Have Distinctive MACI Profiles?
    a. Can the MACI distinguish between offenders with conduct disorder and those without conduct disorder?
    b. Can the MACI distinguish between offenders with symptoms of major depression and those without major depression as indicated by
        i. Diagnosis of major depression by psychologists on staff?
        ii. History of anti-depressant medication?

iii. Suicidal ideation or attempt by history?

c. Can the MACI distinguish between offenders with substance abuse problems and those without substance abuse problems?

Chapter 4: Methods

Participants

The participants were 141 adolescent males recruited from the Reception and Diagnostic Center (RDC), a juvenile corrections facility in Bon Air, Virginia. The RDC houses all youth committed to the custody of the Virginia Department of Juvenile Justice during the initial phase of their incarceration. Once admitted to the RDC, youth undergo a series of medical, psychological, and educational assessments as part of the intake process. Following the assessment process, youth are then transferred to the correctional facility where they will stay for the duration of their incarceration. Length of stay at the RDC is approximately four to six weeks.

Researchers obtained passive consent from each participant's legal guardian. A letter was mailed to each resident's family requesting notification if they did not want their child to participate in the research study. Our sample of RDC residents was selected from a pool of consecutive admissions to the facility during a seven-month period spanning 2000-2001. Participants were chosen from an intake list of new admissions that was provided to researchers each week. A coin flip method was used to ensure a consistently random selection of 50% of the youths from the weekly intake list. Youth were excluded from the selection process if their parents refused consent to participate, or if records reviews revealed an IQ below 70.

Measures

MACI. The Millon Adolescent Clinical Inventory (MACI) is a self-report inventory designed to assess personality styles and levels of psychopathology amongst adolescents in clinical settings. The MACI consists of 160 true-false items generating 31

clinical scales, including 12 scales reflecting the basic personality patterns consistent with Millon's theory of personality (Personality Patterns), 8 scales reflecting the primary concerns of adolescents (Expressed Concerns), and 7 scales reflecting clinical syndromes that are of greatest importance to clinicians working with this population (Clinical Syndromes) (McCann, 1997). A fourth domain, Modifying Indices, provides a validity screen for administrators. Each clinical domain serves a distinct purpose. The Personality Patterns domain is modeled after specific personality disorders from the DSM-IV. A list of each scale and its relevant DSM-IV Axis II disorder can be found in Appendix 2.

The Expressed Concerns domain contains eight scales that focus on adolescent's feelings and attitudes about a variety of problematic issues for many troubled adolescents (Millon et al., 1993). The final clinical domain is Clinical Syndromes, which was developed to relate to specific manifestations of psychopathology as opposed to adolescent's perceptions and feelings as measured in the Expressed Concerns scale. The scales that comprise the Clinical Syndromes section are most reflective of Axis I disorders as defined by DSM-IV.

The MACI has been found to have adequate internal consistency reliability. Alpha coefficients from the Developmental Sample (N = 579) ranged from .73 for scales D and Y, to .91 for Scale B (Millon, 1993). Millon also provided reliability data using the two Cross-Validation Samples combined. When estimating reliability using combined Samples B and C (N = 333), alpha coefficients were similar to those found in the Developmental Sample, and ranged from .69 for Scale D, to .90 for Scale B. Test-Retest reliability coefficients were computed using participants from Samples A and B who

completed the MACI three to seven days apart. These correlations ranged from .57 for Scale E, to .92 for Scale 9. The median stability coefficient was .82 (Millon et al., 1993).

Juvenile profile data. The Reception and Diagnostic Center staff maintains a Juvenile Profile Database with data for each youth admitted to the Virginia Department of Juvenile Justice (McGarvey & Waite, 2000). This profile includes offense history data, social history information, psychological data, information on drug and alcohol use, educational information, medical history, and physical examination information. The profile also includes information that will be used to classify youths into categories based upon offense history such as history of sexual offending, and the number of prior offenses, which were recorded to determine each youth's status as a chronic offender. This juvenile profile data is compiled by staff from the RDC's Behavioral Services Unit following a review of the youth's criminal and institutional records, contact with other professionals involved in the youth's care, clinical interviews, and psychological testing with the youth (McGarvey & Waite, 2000).

Violence history ratings. Independent raters completed a records review to obtain information on each participant's violence history. Each juvenile's records included their admission summary, social history, mental health records, records from other institutions, current institutional records, and pre-sentencing investigation reports if available. Raters recorded whether or not participants had any instances of violent offending in their records. This determination included records of offenses that may or may not have led to a criminal charge. In addition to violence classification based upon a review of records prior to incarceration at the RDC, raters also recorded whether each participant had received any institutional charges for physically aggressive behavior during their length

of stay at the RDC. For this measure of institutional violence, physically aggressive behavior included instances of fighting, hitting, or pushing, but did not include instances of cursing or threatening that did not result in physical contact.

The raters utilized the protocol developed by Cornell et al. (1996) to classify whether each youth was a nonviolent offender, a reactive violent offender, or an instrumental violent offender. Youth were classified as nonviolent if they had no convictions for violent offenses and no indication of violent behavior in their social or institutional history. Raters classified offenders as reactive if their records indicated that they had committed violence only in reaction to an interpersonal dispute or conflict. Offenders were classified as instrumental offenders if their record contained evidence of at least one act of violence for a clearly identifiable purpose other than responding to provocation or conflict. Instrumental offenses in this sample were most commonly robbery or rape (Murrie, 2001). After raters were trained in distinguishing instrumental from reactive violent offenses, interrater agreement was assessed on the first 16 cases. The four interviewers obtained 100% agreement as to whether participants were nonviolent, reactive, or instrumental.

Overt aggression scale (OAS). Another means of measuring aggressive behaviors in adolescents is with the Overt Aggression Scale for the objective rating of verbal and physical aggression (Yudofsky et al., 1986). The OAS was developed to measure aggressive behaviors in adults and children, and divides aggression into four categories, verbal aggression, physical aggression against objects, physical aggression against self, and physical aggression against others. The OAS is completed by a third party rater and has been found to have good internal reliability (>.75) for most items. Raters are required

to rank the frequency of each behavior over the past week using a four point Likert scale that ranges from Never, Once, Two-Three times, More than Three times. Staff completed an adapted version of the OAS scale for each youth admitted to the RDC.

Staff diagnosis of DSM-IV psychopathology. Psychologists from the Behavioral Services Unit determined whether youths meet criteria for a DSM-IV mental disorder. This diagnostic decision is based upon the extensive assessment data compiled at the RDC. Thus, psychologists consider offense history information, family and social history, educational history, psychological history, and drug and alcohol history information. They also have access to data on youth's current functioning from a personality inventory administered at the RDC (Personality Inventory for Youth), institutional adjustment information, and clinical observation and interviews conducted over the course of their stay at RDC (McGarvey & Waite, 1999). Staff diagnosis of conduct disorder, attention deficit hyperactivity disorder, major depression, and substance abuse disorders will be used in this study. The problem with using staff diagnosis as a measure of mental disorders is the lack of reliability data for the BSU staff. Although diagnoses were made by skilled clinicians with extensive experience working with a juvenile offender population, the lack of demonstrated diagnostic reliability can be considered a limitation to this study. To counter this limitation, staff diagnosis will be supplemented with additional data (history of psychological treatment, history of psychiatric medications) so that it will not be the sole criteria for the presence of mental health problems.

Procedure

This study will use MACI data from juvenile offenders selected to participate in a study of juvenile psychopathy. Participants in that study (Murrie, 2001) were asked to

complete a MACI, as well as the Psychopathy Checklist Revised – Youth Version (Hare, 1991), a semi-structured interview that measures psychopathy traits in juveniles. Information on the juvenile psychopathy component of the study is not reported here and can be found elsewhere (Murrie, 2001). Each participant agreed to participate in the study prior to administration of the MACI. Administration of all MACI's took place at the cabins that housed the participants. Researchers were provided space adjacent to the main room where detainees participated in academic instruction during the day. MACI's were administered by project staff in small groups of one to three participants, depending upon the availability of subjects. Participants were informed that project staff worked independent of the RDC, that MACI information would remain confidential from facility staff, and that completion of the MACI had no impact on their sentencing. Project staff were prepared to play an audiotape of the MACI for participants who did not read well enough to complete the measure on their own. Project staff remained present to answer any questions participants had about individual items and to ensure that the MACI was completed independently.

Chapter 5: Results

Descriptive Findings

The MACI was administered to 141 juvenile offenders. Six offenders completed invalid MACI protocols due to the endorsement of one or more of the validity items (e.g., "I have not seen an automobile in 10 years"), reducing the sample size to 135. Juvenile offenders ranged in age from 13 to 18, including 5 thirteen year-olds, 6 fourteen year-olds, 28 fifteen year-olds, 45 sixteen year-olds, 46 seventeen year-olds, and five 18 year-olds. The mean age of participants was 16.0 (SD=1.1). Sixty-nine participants identified themselves as African American (51.1%), 55 as Caucasian (40.7%), seven as Hispanic (5.2%), and three as Other (2.2%). One participant did not endorse any racial group (.7%).

Base rate scores on the MACI can range from 0 to 115. In the present sample, there was a substantial range of scores. Of the twelve scales that comprise the Personality Patterns, mean base rate scores for all 135 juvenile offenders ranged from 38.8 (Borderline Tendency) to 68.8 (Unruly). Mean base rate scores for the eight scales that comprise Expressed Concerns ranged from 18.8 (Body Disapproval) to 70.7 (Social Insensitivity). The scales comprising Clinical Syndromes ranged from 16.3 (Eating Dysfunction) to 73.7 (Delinquent Predisposition). Table 1 provides means and standard deviations for all 30 MACI scales.

On the MACI, a base rate score at or above 75 indicates that the trait being measured is considered present and clinically significant, and at or above 85 indicates that the trait being measured is prominent and highly significant. In the juvenile offender sample, 122 respondents (90.4%) had at least one base-rate score of 75 or greater on one

of the 27 MACI clinical scales, while 99 respondents (73.3%) had at least one base rate score of 85 or greater. The mean number of scale elevations for juvenile offenders was

Table 1. MACI Base Rate Scores for Juvenile Offenders

MACI Scale	N	Minimum	Maximum	Mean	Std. Deviation
Disclosure	135	0	98	53.21	19.86
Desirability	135	17	95	67.44	16.57
Debasement	135	35	95	54.42	16.65
Introversive	135	6	109	47.67	16.16
Inhibited	135	1	87	42.42	19.39
Doleful	135	6	93	54.27	21.79
Submissive	135	1	89	54.78	17.33
Dramatizing	135	4	102	61.15	17.25
Egotistic	135	8	87	56.41	14.29
Unruly	135	18	108	68.76	18.66
Forceful	135	2	108	39.47	25.84
Conforming	135	1	99	53.27	18.08
Oppositional	135	13	103	59.97	19.09
Self Demeaning	135	1	106	42.21	20.32
Borderline Tendency	135	3	90	38.79	22.68
Identity Diffusion	135	16	98	46.53	17.62
Self Devaluation	135	12	104	44.64	22.81
Body Disapproval	135	1	98	18.79	18.77
Sexual Discomfort	135	11	79	45.16	13.63
Peer Insecurity	135	4	112	43.89	21.01
Social Insensitivity	135	20	112	70.69	18.64
Family Discord	135	16	105	64.16	19.86
Childhood Abuse	135	6	111	33.75	23.26
Eating Dysfunction	135	1	108	16.32	16.25
Substance Abuse Proneness	135	6	115	60.19	31.48
Delinquent Predisposition	135	30	115	73.71	17.16
Impulsive Propensity	135	6	115	60.01	24.61
Anxious Feelings	135	1	112	53.09	20.61
Depressive Affect	135	8	110	53.15	25.93
Suicidal Tendency	135	1	111	28.93	21.51

4.6 (≥75) and 2.4 (≥85). Table 2 provides a summary of the number of elevated scores for the juvenile offender sample.

Table 2. Elevated Base Rate Scores for Juvenile Offenders

	Number of MACI scales > 75			Number of MACI scales > 85		
Elevations	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
0	13	9.6	9.6	36	26.7	26.7
1	15	11.1	20.7	30	22.2	48.9
2	16	11.9	32.6	17	12.6	61.5
3	13	9.6	42.2	17	12.6	74.1
4	17	12.6	54.8	8	5.9	80.0
5	10	7.4	62.2	15	11.1	91.1
6	14	10.4	72.6	2	1.5	92.6
7	13	9.6	82.2	4	3.0	95.6
8	8	5.9	88.1	2	1.5	97.0
9	5	3.7	91.9	2	1.5	98.5
10	2	1.5	93.3	1	.7	99.3
11	3	2.2	95.6	0	0	0
12	2	1.5	97.0	1	.7	100.0
13	3	2.2	99.3	0	0	0
14	1	.7	100.0	0	0	0
Totals	135	100.0		135	100.0	

Among the twelve scales that comprise Personality Patterns, juvenile offenders were most likely to score in the clinical range (≥ 75) on the Unruly scale (58 participants). The least likely scales to have elevations were Self-Demeaning and Introversive, as only four offenders scored in the clinical range on each scale. On the Expressed Concerns scales, offenders were most likely to have elevations on the Family Discord scale (55), and least likely to have elevations on the Sexual Discomfort scale (2). Delinquent Predisposition was the most frequently elevated scale among Clinical

Syndromes (62), while Eating Dysfunctions was the least (1). Table 4 provides a summary of the number of elevated base rate scores for each MACI scale.

Age and race differences. A multivariate analysis of variance (MANOVA) was utilized to test for age differences in base-rate scores on the 30 MACI scales. Offenders were grouped into three age groups, 13-15 year olds (n = 32), 16 year olds (n = 43), and 17-18 year olds (n = 49). The MANOVA was significant for age differences (F (60, 206) = 3.42, p = .000, Eta^2 = .50). Follow-up univariate analyses of variance (ANOVA) were conducted to determine which MACI scales had significant differences by age. Only one scale, Peer Insecurity, was found to have significant mean differences between age groups (p < .04, Eta^2 = .05), with 13-15-year-olds (37.21) scoring significantly lower than 16-year-olds (48.47). Effect sizes for these analyses ranged from .001 to .05.

A multivariate analysis of variance (MANOVA) was utilized to compare MACI base rate scores between African American and Caucasian offenders. Race was broken down into the two groups that comprised 92% of our sample, Caucasian (n = 55) and African American (n = 69). A MANOVA comparing racial groups on all 30 MACI scales was not significant (p = .07). When groups were compared on the 27 clinical scales, the MANOVA was significant for race differences (F (27, 96) = 1.6, p = .05, Eta^2 = .31). Follow-up univariate analyses of variance (ANOVA) were used to compare specific scales between groups. The significant alpha value for these analyses was set at .05/27 = .002 in an effort to correct for possible Type I error. Using this criterion, significant differences were found on only one MACI scale, Substance Abuse Proneness (p < .000, Eta^2 = .10). Mean differences approached significance for Egotistic (p = .003), Borderline

Table 3. MACI Elevations by Scale

MACI Scale	Participants with BR ≥75	Percentage of Population	Participants with BR ≥85	Percentage of Population
Introversive				
Juvenile Offender	4	3.0	2	1.5
Psychiatric	6	15.4	2	5.1
Inhibited				
Juvenile Offender	10	7.4	3	2.2
Psychiatric	5	12.8	2	5.1
Doleful				
Juvenile Offender	33	24.4	10	7.4
Psychiatric	14	35.9	1	2.6
Submissive				
Juvenile Offender	12	8.9	3	2.2
Psychiatric	5	12.8	0	0
Dramatizing				
Juvenile Offender	25	18.5	15	11.1
Psychiatric	3	7.7	0	0
Egotistic				
Juvenile Offender	11	8.1	2	1.5
Psychiatric	1	2.6	0	0
Unruly				
Juvenile Offender	58	43.0	32	23.7
Psychiatric	16	41.0	13	33.3
Forceful				
Juvenile Offender	16	11.9	11	8.1
Psychiatric	13	33.3	8	20.5
Conforming				
Juvenile Offender	17	12.6	7	5.2
Psychiatric	2	5.1	1	2.6
Oppositional				
Juvenile Offender	27	20.0	10	7.4
Psychiatric	17	43.6	4	10.3
Self-Demeaning				
Juvenile Offender	4	3.0	2	1.5
Psychiatric	6	15.4	0	0
Borderline Tendencies				
Juvenile Offender	15	11.1	6	4.4
Psychiatric	12	30.8	3	7.7
Identify Diffusion				
Juvenile Offender	13	9.6	3	2.2
Psychiatric	12	30.8	4	10.3

Self-Devaluation				
Juvenile Offender	18	13.3	7	5.2
Psychiatric	12	30.8	6	15.4
Body Disapproval				
Juvenile Offender	4	3.0	3	2.2
Psychiatric	4	10.3	2	5.1
Sexual Discomfort				
Juvenile Offender	2	1.5	0	0
Psychiatric	3	7.7	1	2.6
Peer Insecurity				
Juvenile Offender	14	10.4	5	3.7
Psychiatric	10	25.6	6	15.4
Social Insensitivity				
Juvenile Offender	49	36.3	34	25.2
Psychiatric	14	35.9	6	15.4
Family Discord				
Juvenile Offender	55	40.7	27	20.0
Psychiatric	22	56.4	14	35.9
Childhood Abuse				
Juvenile Offender	10	7.4	5	3.7
Psychiatric	8	20.5	4	10.3
Eating Dysfunction				
Juvenile Offender	1	.7	1	.7
Psychiatric	2	5.1	1	2.6
Substance Abuse				
Juvenile Offender	46	34.1	30	22.2
Psychiatric	14	35.9	7	17.9
Delinquent Predisposition				
Juvenile Offender	62	45.9	43	31.9
Psychiatric	16	41.0	12	30.8
Impulsive Propensity				
Juvenile Offender	50	37.0	23	17.0
Psychiatric	18	46.2	11	28.2
Anxious Feelings				
Juvenile Offender	14	10.4	9	6.7
Psychiatric	6	15.4	5	12.8
Depressive Affect				
Juvenile Offender	39	28.9	21	15.6
Psychiatric	25	64.1	14	35.9
Suicidal Tendencies				
Juvenile Offender	9	6.7	4	3.0
Psychiatric	11	28.2	3	7.7

Note. Juvenile Offender, N = 135; Psychiatric Patient, N = 39.

Tendency (p = .003), and Childhood Abuse (p = .003). Effect sizes for these analyses ranged from .003 to .10. Table 4 shows complete MANOVA results.

Comparison with psychiatric sample. The MACI results from the juvenile offender sample were compared with a sample of adolescents undergoing psychiatric hospitalization at another Virginia state facility. This sample was recruited to participate in a study on predictors of aggressive behavior by adolescent inpatients (Stafford, 1997). Participants in that study were drawn from 165 consecutive admissions to a state psychiatric hospital between December 1995 and June 1996. Patients were excluded from the study if they had an active current psychosis (17 patients excluded on that basis), failure to obtain voluntary informed consent from either the adolescent or his parent or guardian (32 patients excluded) or intellectual functioning determined to be in the mentally retarded range according to staff consensus (9 patients excluded). Of the remaining adolescent patients in this sample, 45 were male. Of these 45 adolescents, only 39 completed valid MACI's. This psychiatric sample ranged in age from 12 to 17. The sample consisted of 9 twelve year olds, 7 thirteen year olds, 5 fourteen year olds, 9 fifteen year olds, 6 sixteen year olds, and 3 seventeen year olds. The ethnic composition of the sample included 30 Caucasian patients, and nine patients from other ethnic groups.

Of the twelve scales that comprise the Personality Patterns, mean base rate scores for the 39 male psychiatric patients ranged from 41.6 (Conforming) to 70.1 (Unruly). Mean base rate scores for the eight scales that comprise Expressed Concerns ranged from 36.9 (Body Disapproval) to 72.6 (Family Discord). The scales comprising Clinical Syndromes ranged from 27.6 (Eating Dysfunction) to 73.9 (Depressive Affect).

Table 4. ANOVA Results of Race Comparisons of Juvenile Offenders

MACI Scale	African Americans (n=69)	Caucasians (n=55)	F-Statistic	Eta^2
Introversive	47.4	45.8	.31	.003
Inhibited	39.1	46.0	4.07*	.03
Doleful	52.2	57.0	1.50	.01
Submissive	57.0	51.8	2.73	.02
Dramatizing	63.9	58.3	3.24	.03
Egotistic	59.6	52.0	9.52**	.07
Unruly	66.6	71.4	2.08	.02
Forceful	36.4	44.5	3.02	.02
Conforming	57.1	48.1	7.62**	.06
Oppositional	57.0	64.1	4.17*	.03
Self-Demeaning	38.1	48.1	7.99**	.06
Borderline Tendency	33.3	45.7	9.34**	.07
Identity Diffusion	44.3	48.7	1.86	.02
Self-Devaluation	40.0	50.4	6.76**	.05
Body Disapproval	15.6	23.1	4.83*	.04
Sexual Discomfort	45.9	43.8	.68	.01
Peer Insecurity	42.4	44.6	.35	.003
Social Insensitivity	71.7	70.0	.27	.002
Family Discord	61.1	68.7	4.63*	.04
Childhood Abuse	28.6	40.9	8.89**	.07
Eating Dysfunction	15.1	18.4	1.18	.01
Substance Abuse Proneness	52.2	72.4	13.12***	.10
Delinquent Predisposition	72.3	75.5	1.10	.01
Impulsive Propensity	55.2	65.9	5.99*	.05
Anxious Feelings	55.9	49.8	2.78	.02
Depressive Affect	49.1	60.1	5.82*	.05
Suicidal Tendency	25.0	34.9	6.73*	.05

Note. Multivariate F (27, 96) = 1.6, $p < .05$, $Eta^2 = .31$).

* $p < .05$

** $p < .01$

*** $p < .001$

Table 5 provides mean MACI scores for the 39 patients in the psychiatric sample.

In the psychiatric sample, 97.4% of participants had at least one base rate score of 75 or greater, while 87.2% had at least one base-rate score at or above 85. The range of scale elevations was 0 to 14, meaning that one patient had no elevations on any MACI scale, while three patients had MACI scale elevations on 14 MACI scales (≥75). The mean number of scale elevations for psychiatric patients was 7.1 (≥ 75) and 3.3 (≥ 85). Table 6 provides a summary of the number of elevated scores for the psychiatric sample.

Of the twelve scales that comprise Personality Patterns, psychiatric patients were most likely to have base rate scores in the clinical range (≥ 75) on the Unruly scale (16), and least likely to have elevations on the Egotistic scale (1). On the Expressed Concerns scales, patients were most likely to have elevations on the Family Discord scale (22), and least likely to have elevations on the Sexual Discomfort scale (3). Depressive Affect was the most frequently elevated scale among Clinical Syndromes (25), while Eating Dysfunctions was the least (2). Table 4 provides a summary of the number of elevated scores for both psychiatric patients and juvenile offenders on each MACI scale.

I conducted a MANOVA to compare the mean base rate scores of juvenile offenders with those of psychiatric patients. The MANOVA was significant for group effects, ($\underline{F}$ (30, 143) = 3.51, $\underline{p} < .000$, $Eta^2 = .42$). Significant differences were found on 21 of 30 MACI scales. The psychiatric sample had higher base rate scores than the juvenile offender sample for 16 of the 21 mean differences. Effect sizes for significant mean differences ranged from .03 to .12. Using a Bonferonni correction to control for the possibility of Type I error, significance levels were placed at .05/30 = .002. Sixteen of the

Table 5. MACI Base Rate Scores for Psychiatric Patients

MACI Scale	N	Minimum	Maximum	Mean	Std. Deviation
Disclosure	39	5	97	63.41	22.00
Desirability	39	20	85	55.49	17.60
Debasement	39	35	95	64.18	18.28
Introversive	39	25	104	59.41	16.21
Inhibited	39	16	97	53.41	20.64
Doleful	39	10	93	59.85	21.66
Submissive	39	10	82	48.46	19.03
Dramatizing	39	7	84	50.54	17.19
Egotistic	39	11	79	46.77	16.94
Unruly	39	9	107	70.13	23.94
Forceful	39	1	111	55.79	30.53
Conforming	39	6	89	41.56	18.05
Oppositional	39	22	91	67.54	16.05
Self Demeaning	39	7	79	53.82	21.55
Borderline Tendency	39	4	87	56.44	23.79
Identity Diffusion	39	18	112	59.26	24.71
Self Devaluation	39	11	109	57.49	28.08
Body Disapproval	39	5	108	36.85	27.38
Sexual Discomfort	39	13	115	46.08	22.03
Peer Insecurity	39	6	104	50.59	28.10
Social Insensitivity	39	17	104	62.82	20.94
Family Discord	39	21	110	72.64	20.59
Childhood Abuse	39	6	113	48.10	27.47
Eating Dysfunction	39	3	108	27.56	22.39
Substance Abuse Proneness	39	4	115	61.00	29.95
Delinquent Predisposition	39	25	104	69.13	21.53
Impulsive Propensity	39	10	103	65.97	26.93
Anxious Feelings	39	21	115	53.46	22.16
Depressive Affect	39	12	111	73.92	25.06
Suicidal Tendency	39	5	111	49.82	30.86

Table 6. Elevated MACI Base Rate Scores for Psychiatric Patients

	Number of MACI scales > 75			Number of MACI scales > 85		
Elevations	Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
0	1	2.6	2.6	5	12.8	12.8
1	2	5.1	7.7	7	17.9	30.8
2	4	10.3	17.9	7	17.9	48.7
3	1	2.6	20.5	5	12.8	61.5
4	4	10.3	30.8	4	10.3	71.8
5	1	2.6	33.3	1	2.6	74.4
6	6	15.4	48.7	4	10.3	84.6
7	2	5.1	53.8	2	5.1	89.7
8	2	5.1	59.0	3	7.7	97.4
9	3	7.7	66.7	0	0	0
10	5	12.8	79.5	0	0	0
11	3	7.7	87.2	1	2.6	100.0
12	1	2.6	89.7	0	0	0
13	1	2.6	92.3	0	0	0
14	3	7.7	100.0	0	0	0
Total	39	100.0		39	100.0	

21 mean differences were found to be significant at that level with effect sizes in the range of .05 and .12.

Because race and group membership appear to be confounded, I conducted a 2x2 MANOVA to test for group differences after race was partialed out. There was a significant main effect for group status, F (30, 140) = 3.29, $p < .000$, $Eta^2 = .41$). Univariate analyses revealed that, once corrected for race, 15 of 30 MACI clinical scales were statistically significant ($p < .05$) with effect sizes ranging from .03 to .07. Psychiatric patients had higher base rate scores on twelve of the fifteen mean differences. A Bonferonni adjustment set the significance level at .002, and psychiatric patients had

higher scores on the only five scales that were significant, Introversive, Borderline Tendency, Body Disapproval, Depressive Affect, and Suicidal Tendency.

Correlations with outcome criteria

Statistically significant correlations ($p<.05$) were found between MACI scales and our outcome criteria. I calculated 300 two-tailed correlations between the 30 MACI scales and ten outcome criteria and found 100 to be significant. Correlations between the MACI clinical scales and 10 outcome criteria ranged from .18 to .47, all statistically significant. See Table 7 for scale correlations with select outcome criteria. Offenders who committed violent offenses while incarcerated were more likely to score higher on 18 of the 30 MACI scales than offenders who did not commit violent offenses. MACI scales that correlated significantly with this measure of violent behavior included Submissive (-.25), Forceful (.25), Conforming (-.26), Sexual Discomfort (-.27), and Impulsive Propensity (.21).

I used a modified version of the OAS scale as another measure of aggressive behavior. Staff at the juvenile facility completed a modified version of the OAS for each juvenile offender. Based upon this rating scale, I tabulated a score for offender's aggression towards objects, peers, and staff. Thirty correlations were calculated between MACI scales and this modified OAS score and found that eight were significantly correlated. Correlations ranged from .17 (Impulsive Propensity) to .21 (Delinquent Predisposition).

Table 7. MACI Scale Correlations with Outcome Criteria

MACI Scale	Violence While Incarcerated	OAS Aggression vs. objects/peers/staff	Chronic Offenders	Sex Offenders	Mood Disorder	Conduct Disorder	Substance Abuse Disorder
Introversive	.089	.041	-.003	.049	.116	.024	-.046
Inhibited	.019	-.183*	-.022	.104	.211*	.136	-.048
Doleful	.159	-.028	.054	-.047	.201*	.176*	.306**
Submissive	-.253**	-.182*	-.233**	.106	-.046	-.116	-.275**
Dramatizing	-.099	-.035	-.118	-.030	-.248**	-.134	-.074
Egotistic	-.081	.029	-.101	.020	-.286**	-.065	-.185*
Unruly	.166	.169	.138	-.161	-.094	-.011	.304**
Forceful	.245**	.253**	.128	-.164	.011	.050	-.274**
Conforming	-.260*	-.195*	-.257**	.070	-.195*	-.153	-.337**
Oppositional	.173	.151	.098	-.053	.191*	.063	.317**
Self Demeaning	.187*	-.067	.004	-.012	.215*	.141	.287**
Borderline Tendencies	.179*	.122	.122	-.078	.153	.038	.300**
Identity Diffusion	.211*	.173*	.107	-.096	.170	.067	.325**
Self Devaluation	.184*	-.043	.018	-.003	.288**	.131	.234**
Body Dissaproval	.080	-.045	-.091	-.031	.166	.093	.090
Sexual Discomfort	-.274**	-.159	-.151	.223**	.008	-.065	-.351**

Peer Insecurity	-.016	-.018	.008	.075	.161	.076	-.052
Social Insensitivity	.225*	.187*	.123	-.139	-.102	.051	.180*
Family Discord	.180*	.097	.168	-.102	.099	.009	.334**
Child Abuse	.183*	-.083	.141	.031	.285**	.096	.188*
Eating	.078	-.068	-.074	-.030	.203*	.126	.017
Substance Abuse Proneness	.196*	.104	.204*	-.145	.116	.138	.472**
Delinquent Predisposition	.192*	.213*	.114	-.140	-.147	-.049	.350**
Impulsive Propensity	.208**	.172*	.207*	-.138	.026	.058	.335**
Anxious Feelings	-.186*	-.043	-.194*	.145	.033	-.102	-.278**
Depressive Affect	.091	-.020	.082	-.001	.300**	.238**	.232**
Suicidal Tendencies	.189*	.015	.089	-.038	.288**	.092	.301**
Disclosure	.251**	.139	.119	-.081	.230**	.193*	.348**
Desirability	-.047	-.117	-.187*	-.044	-.183*	.045	-.128
Debasement	.218*	.007	.096	-.009	.306**	.115	.292**

* $p < .05$
** $p < .01$
*** $p < .001$

A third measure of aggressive behavior used in this study was a classification of offenders into nonviolent, reactive violence, or instrumental violence categories. Researchers utilized the protocol developed by Cornell et al. (1996) to classify whether each youth was a nonviolent offender, a reactive violent offender, or an instrumental violent offender based upon a review of offense history. I conceptualized nonviolence, reactive violence, and instrumental violence as different points along a continuum that ranged from unwillingness to commit violence, to capable of committing violence in an emotional response to provocation, to a comfort employing violence strategically for other goals. This same categorization was also used in a previous study of juvenile psychopathy (Murrie, 2002). This classification as an ordinal variable allowed the present study to conduct correlations with MACI scores. Interestingly, none of the 27 MACI scales were statistically significant with this measure of violent behavior, with correlations ranging from .001 (Childhood Abuse) to -.15 (Family Discord).

MACI scales were also correlated with the RDC's measure of chronicity of offending derived from the number and severity of prior offenses. Five out of 30 MACI scales were significantly correlated with this measure of chronic offending, including Submissive (-.23), Conforming (-.26), Substance Abuse Proneness (.20), Impulsive Propensity (.21), and Anxious Predisposition (-19).

Only one MACI clinical scale out of 30 correlated with a measure of sex offenders. Sex offenders were those youth who had a documented history of sexual offenses. The MACI's Sexual Discomfort scale correlated with this measure at a level of .23. The Sexual Discomfort scale measures adolescent's rate and comfort level with developing sexuality. Adolescents scoring high on this scale are described by Millon as

troubled and preoccupied with thoughts and feelings of sexuality, and fearful of their sexual impulses.

MACI clinical scales also correlated positively with outcome criteria measuring mental health problems. I calculated 120 correlations between the 30 MACI scales and measures of mood disorder, conduct disorder, and substance abuse problems, and found 64 to be significant. Significant correlations with a measure of mood disorders ranged from .19 (Oppositional) to .30 (Depressive Affect). Additional correlations were conducted with two other measures of depression, documented history of suicidal behavior or suicidal ideation, and a documented history of antidepressants. The measure of suicidal behavior correlated with four MACI scales with correlation coefficients ranging from .19 (Borderline Tendency) to .34 (Suicidal Tendency), while the measure of antidepressant use correlated with 19 MACI scales with scores ranging from .17 (Inhibited) to .38 (Childhood Abuse).

The measure of conduct disorder correlated significantly with only two MACI scales, Doleful (.18), and Depressive Affect (.24). The measure of substance abuse problems correlated with 21 of 27 MACI clinical scales with scores ranging from -.19 (Egotistic) to .47 (Substance Abuse Proneness).

Confirmatory Factor Analysis

Salekin conducted an exploratory factor analysis of MACI data from 250 juvenile offenders. Salekin ran three separate factor analyses, one for each of the three groups of clinical scales including Personality Patterns, Expressed Concerns, and Clinical Syndromes and reported that each analysis resulted in a two-factor solution. I conducted a confirmatory factor analysis to determine if Salekin's factor models provided a good fit

with the present sample. The AMOS 4.1 (Arbuckle & Wothke) program was used to determine the level of fit. Separate analyses were conducted comparing each of the three sets of MACI scales, Personality Patterns, Expressed Concerns, and Clinical Syndromes.

For each factor analysis, four statistics were used to determine the goodness of fit of the expected factor structure. In addition to the chi-square statistic, I utilized the goodness of fit index (GFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). The GFI and CFI statistics range from 0-1, with values of .9 or higher considered an indication of fit between data sets (Bentler & Bonnett, 1980). The RMSEA index indicates a close fit of the model when values are less than .05 (Browne & Cudeck, 1993).

Overall, Salekin's factor structure was found to be a poor fit for our juvenile offender sample. For example, the first analysis tested the fit between offender's scores on the twelve Personality Patterns scales with the two-factor solution found by Salekin (2002). This analysis indicated an unacceptable fit based on $\chi^2(48) = 330.05$, $p<.001$; GFI = .74; CFI = .80; RMSEA = .21. For Expressed Concerns, the present study's data was similarly a poor fit with Salekin's two factor model as evidenced by $\chi^2(20) = 286.91$, $p<.001$; GFI = .70; CFI = .46; RMSEA = .32. Finally, the juvenile offender sample's scores on the Clinical Syndromes scales was also found to have an unacceptable fit with Salekin's two factor model based on $\chi^2(13) = 177.80$, $p<.001$; GFI = .74; CFI = .74; RMSEA = .31.

Exploratory Factor Analysis

I conducted an exploratory factor analysis for the MACI scores of the juvenile offender sample. Separate analyses were conducted for Personality Patterns (12 scales),

Expressed Concerns (8 scales), and Clinical Syndromes (7 scales). For each of the three factor analyses, I employed principal components factoring using varimax rotation. Factors were retained based upon examination of the scree plots, and presence of eigenvalues greater than 1.0.

Factor analytic techniques analyze variance, which is represented by the sum of the values in the positive diagonal of the correlation matrix. Principal components factoring differs from other factor analytic techniques in that it accounts for all the variance, including error and unique variance, by placing 1's in the diagonal of the correlation matrix. This differs from other methods of factor analysis, such as principal axis factoring, which uses estimates of shared variance, or communalities, in the diagonal. The resulting difference between the two methods is that principal components factoring is an analysis of variance, while principal axis factoring is an analysis of covariance. According to Tabachnick & Fidell (2001), principal components factoring is the solution of choice for reducing a large number of variables down to a smaller number of components, and may be the preferred choice in providing researchers with an empirical summary of a data set. A separate factor analysis of the MACI also utilized principal components factoring (Romm, Bockian, & Harvey, 1999), and for the purpose of the present study it appears that this approach is a logical choice for analyzing the MACI scales.

The twelve MACI scales that comprise Personality Patterns generated a three-factor solution that explained 81.9% of the total variance. The first factor consisted of four scales that had unique and substantial loadings, including Submissive, Unruly, Forceful, and Conforming. This factor appears to be a measure of aggressive behavior.

This factor accounted for 33% of the common variance. Factor II was comprised of four scales with unique and substantial loadings, including Introversive, Inhibited, Dramatizing, and Egotistic. This factor accounted for 26% of the variance and appeared to be measuring personality characteristics that were dramatic, histrionic, and self-centered. This factor was named, Attention-Seeking. Factor III was comprised of two scales, Self Demeaning and Doleful, with unique and substantial loadings. This Factor accounted for 23% of the variance and had substantial loadings for two scales (Oppositional and Borderline Tendency) that also loaded on Factor I. Factor III appears to be a measure of depressive personality style that may be marked by angry, surly behavior towards others. This combination of personality characteristics appeared to describe a Self-Defeating factor. Table 8 shows the factor structure of the 12 Personality Patterns scales.

Table 8. Factor Structure of the MACI Personality Patterns Scales

Scale	Factor I Aggressive	Factor II Attention-seeking	Factor III Self-defeating
Submissive	***-.923***	-.022	-.058
Forceful	***.912***	.049	.133
Conforming	***-.826***	.301	-.361
Unruly	***.799***	.348	.261
Oppositional	***.650***	-.233	***.562***
Dramatizing	-.129	***.935***	-.150
Introversive	-.045	***-.855***	.059
Egotistic	-.104	***.792***	-.412
Inhibited	-.334	***-.667***	.401
Self-Demeaning	.160	-.258	***.876***
Doleful	.208	-.204	***.835***
Borderline Tendency	***.527***	-.150	***.692***
Eigenvalues	3.92	3.08	2.84
Variance Accounted For	32.6%	25.7%	23.6%

Note. Factor loadings greater than .50 are italicized. Total variance accounted for was 81.9%

A factor analysis of the eight Expressed Concerns scales generated a two-factor solution. Factor I was composed of four scales that contributed unique and substantial loadings including Self-Devaluation, Childhood Abuse, Body Disapproval, and Peer Insecurity. This factor was named Poor Self-Concept, and accounted for 33% of the variance among the Expressed Concerns scales. The second factor was comprised of three scales with unique and substantial loadings including Family Discord, Sexual Discomfort, and Social Insensitivity. This factor appears to be measuring socially problematic behavior, and was named Interpersonal Problems. This factor accounted for 32% of the variance. The Identity Diffusion scale loaded similarly on both Factor I and Factor II. See Table 9 for Expressed Concerns factor loadings.

The seven Clinical Syndromes scales yielded a two-factor solution (See Table 10). Factor I consisted of four scales with unique and substantial loadings and accounted for 47% of the common variance. This factor appears to provide a measure of antisocial or delinquent personality traits (Antisocial-Delinquent). The four scales that loaded significantly on this factor included Anxious Feelings, Delinquent Predisposition, Impulsive Propensity, and Substance Abuse Proneness. Factor II consisted of three scales that loaded uniquely and significantly, and included Depressive Affect, Suicidal Tendency, and Eating Dysfunction. This appears to be a measure of depression, and was named Depressed Mood. This factor accounted for 31% of the common variance.

Table 9. Factor Structure of the MACI Expressed Concerns Scales

Scale	Factor I Poor Self-concept	Factor II Interpersonal Problems
Self-Devaluation	***.911***	.244
Childhood Abuse	***.686***	.393
Body Disapproval	***.656***	-.079
Peer Insecurity	***.597***	-.356
Family Discord	.112	***.840***
Sexual Discomfort	-.141	***-.821***
Social Insensitivity	-.424	***.704***
Identity Diffusion	***.599***	***.608***
Eigenvalues	2.66	2.59
Variance Accounted For	33.2%	32.4%

Note. Factor loadings greater than .50 are italicized. Total variance accounted for was 65.6%

Table 10. Factor Structure of the MACI Clinical Syndromes Scales

Scale	Factor I Antisocial-delinquent	Factor II Depressed Mood
Anxious Feelings	***-.921***	.037
Delinquent Predisposition	***.904***	-.282
Impulsive Propensity	***.859***	.283
Substance Abuse Proneness	***.839***	.378
Depressive Affect	-.122	***.914***
Suicidal Tendency	.337	***.782***
Eating Dysfunction	-.186	***.638***
Eigenvalues	3.27	2.16
Variance Accounted For	46.7%	30.8%

Note. Factor loadings greater than .50 are italicized. Total variance accounted for was 77.5%

Correlations by factors. Utilizing the seven factors generated by the exploratory factor analysis, correlations were calculated between ten outcome criteria and each of the seven factors for a total of 70 correlations. Twenty-six of these correlations were statistically significant ($p < .05$). Table 11 has select correlation results with all seven factors. Each of the three factors from the Personality Patterns scales correlated with at least one outcome criterion. The Aggressive factor correlated with two violent criteria, Violence While Incarcerated (r =.24) and OAS Aggression (.28). The Aggressive factor also correlated with the study's measure of chronic offending (.21), and with Substance Abuse Disorder (r =.28). The Attention Seeking factor correlated with Mood Disorder (-.22). The Self-Defeating factor correlated with two measures of depression, Mood Disorder (.18) and history of antidepressant medication (.19). This factor also correlated with a measure of Substance Abuse Disorder (.29).

The two factors generated from the Expressed Concerns scales also correlated with outcome criteria. The Poor Self-Concept factor correlated with three measures of depression, Mood Disorder (.30), history of suicidal ideation or behavior (.19), and history of antidepressant medication (34). The Interpersonal Problems factor correlated with five different outcome criteria, the most of any factor. The correlations ranged from .18 (OAS Aggression), to .36 (Substance Abuse Disorder).

Antisocial Delinquent and Depressed Mood factors were generated from the MACI's Clinical Syndrome scales. Antisocial Delinquent correlated with two outcome criteria measuring aggression, with a measure of chronic offending (.23), and with Substance Abuse Disorder (.39). The Depressed Mood factor correlated with all three criteria measuring mental health problems, including three measures of depression, Mood

Table 11. Correlations for MACI Factors and Outcome Criteria

Outcome Criteria	Personality Patterns Factor I (Aggressive)	Personality Patterns Factor II (Attention-Seeking)	Personality Patterns Factor III (Self-Defeating)	Expressed Concerns Factor I (Poor Self-Concept)	Expressed Concerns Factor II (Interpersonal Problems)	Clinical Syndromes Factor I (Antisocial-Delinquent)	Clinical Syndromes Factor II (Depressed Mood)
Violence While Incarcerated	.235**	-.069	.102	.119	.277**	.215*	.113
OAS Aggression	.275**	-.015	-.108	-.055	.175*	.186*	-.057
Sex Offenders	-.145	-.074	-.006	.049	-.191*	-.167	.013
Chronic Offenders	.206*	.013	.053	.045	.215*	.231**	.084
Mood Disorder	.018	-.224**	.182*	.303**	.014	-.040	.344**
Conduct Disorder	.045	-.086	.107	.114	.040	.045	.196*
Substance Abuse Disorder	.276**	.011	.293**	.178*	.356**	.387**	.200*

* $p < .05$
** $p < .01$
*** $p < .001$

Disorder (.34), history of suicidal ideation or behavior (.17), and history of antidepressant medication (.32). This factor also correlated with measures of Conduct Disorder (.20) and Substance Abuse Disorder (.20).

Discriminant Function Analyses

Discriminant function analysis was utilized to examine the ability of each factor to distinguish between offenders based on offense history characteristics and by mental health problems. The seven factors were used as independent variables in the discriminant function analysis, while the six outcome variables were used as dependent variables. The outcome variables included measures of three different types of offenders common to juvenile justice facilities (offenders who committed violent offenses while incarcerated, sex offenders, and chronic offenders) and a measure of three types of mental health problems common to juvenile offenders (mood disorder, conduct disorder, and substance abuse problems). I conducted a total of 63 discriminant function analyses and found that 21 were statistically significant ($p < .05$).

Of the three factors comprising Personality Patterns, Factor 1 (Aggressive) successfully classified offenders who committed a violent offense while incarcerated, chronic offenders, and offenders with substance abuse problems. In classifying offenders with substance abuse problems, factor 1 yielded a Wilk's Lambda of .924 ($p<.000$). This factor correctly classified 67.4% of juvenile offenders with substance abuse problems. Sensitivity was .48, specificity was .83 and Kappa was .32.

Factor 2 from Personality Patterns (Attention Seeking) correctly classified offenders diagnosed with a mood disorder. Wilk's lambda was .950 ($p<.01$). This factor successfully classified 69% of offenders with a mood disorder. Sensitivity was .07,

specificity .97, and kappa coefficient was .05. The third factor from Personality Patterns (Self Defeating) correctly classified offenders diagnosed with a mood disorder and those who met criteria for substance abuse. This factor successfully classified 65% of offenders with substance abuse problems ($p<.001$), sensitivity was .50, specificity was .77, and kappa coefficient was .28. See Table 12 for results of discriminant analyses with the three factors derived from the Personality Patterns scales.

The first factor derived from Expressed Concerns (Poor Self-Concept) differentiated between offenders who met three different criteria associated with mood disorders. Of the seven factors, it was the most effective in differentiating between offenders with and without documented suicide risk (Wilk's Lambda = .966, $p<.03$, overall classification accuracy = .81, sensitivity = .04, specificity = 1.0, kappa = .05), as well as between offenders with and without a history of being prescribed antidepressant medication (Wilk's lambda = .887, $p<.001$, 72% correctly classified, sensitivity = .32, specificity = .91, and kappa coefficient = .26). This factor also classified offenders based upon a mood disorder diagnosis. In addition to mood problems, this factor also classified offenders by substance abuse diagnosis as well.Out of the seven factors that emerged from the exploratory factor analyses, the Interpersonal Problems factor was the most successful factor in classifying offenders by outcome criteria. This factor classified offenders who committed violent acts while incarcerated (Wilk's lambda = .940, $p<.006$, 65% correctly classified, sensitivity = .34, specificity = .85, and kappa coefficient = .21). This factor also classified offenders based upon ratings of reactive or instrumental violence (Wilk's lambda = .934). Classification accuracy = 61%, sensitivity = .62, specificity = .57, positive predictive validity = .71, negative predictive validity = .49, and kappa = 20).

Table 12. Discriminant Function Analyses for Personality Patterns Factors

Outcome Criteria	Wilk's Lambda	Chi Square	(df)	P value	Percent Correctly Classified	Sensitivity	Specificity	Positive Predictive Validity	Negative Predictive Validity	Kappa
Violence While Incarcerated										
Factor 1	.941	7.43	1	p<.006**	.64	.3	.86	.6	.65	.18
Factor 2	1.0	.044	1	p<.834	.60	0	1	0	.60	0
Factor 3	.988	1.497	1	p<.221	.56	.5	.61	.46	.64	.11
Chronic Offenders										
Factor 1	.958	5.362	1	p<.021*	.56	.59	.52	.57	.53	.11
Factor 2	1.0	.021	1	p<.866	.52	1	0	.52	0	0
Factor 3	.997	.348	1	p<.555	.54	.82	.23	.54	.54	.05
Sexual Offenders										
Factor 1	.979	2.77	1	p<.096	.82	0	1	0	.82	0
Factor 2	.994	.724	1	p<.395	.82	0	1	0	.82	0
Factor 3	1.0	.005	1	p<.945	.82	0	1	0	.82	0
Mood Disorder										
Factor 1	1.0	.043	1	p<.835	.69	0	1	0	.69	0
Factor 2	.950	6.70	1	p<.010**	.69	.07	.97	.5	.70	.05
Factor 3	.967	4.396	1	p<.036*	.70	.05	.99	.67	.70	.05
Conduct Disorder										
Factor 1	.998	.270	1	p<.604	.64	1	0	.64	0	0
Factor 2	.993	.965	1	p<.326	.64	1	0	.64	0	0
Factor 3	.989	1.50	1	p<.220	.64	1	0	.64	0	0
Substance Abuse										
Factor 1	.924	10.52	1	p<.001**	.67	.48	.83	.69	.67	.32
Factor 2	1.0	.015	1	p<.903	.50	.53	.47	.44	.56	0
Factor 3	.914	11.90	1	p<.001**	.65	.5	.77	.64	.66	.28

Note. N = 125 for Violence While Incarcerated; Chronic offenders, N = 126, Sex offenders, N = 133; Mood disorder, N = 133; Conduct disorder, N = 133, Substance abuse, N = 135.

Table 13. Discriminant Function Analyses for Expressed Concerns Factors

Outcome Criteria	Wilk's Lambda	Chi Square	(df)	P value	Percent Correctly Classified	Sensitivity	Specificity	Positive Predictive Validity	Negative Predictive Validity	Kappa
Violence While Incarcerated										
Factor 1	.998	.297	1	p<.586	.60	0	1	0	.60	0
Factor 2	.940	7.472	1	p<.006**	.65	.34	.85	.61	.66	.21
Chronic Offenders										
Factor 1	.998	.254	1	p<.614	.53	.95	.07	.53	.57	.02
Factor 2	.954	5.834	1	p<.016*	.56	.59	.53	.58	.54	.12
Sex Offenders										
Factor 1	.998	.311	1	p<.577	.82	0	1	0	.82	0
Factor 2	.964	4.852	1	p<.028*	.82	0	1	0	.82	0
Mood Disorder										
Factor 1	.908	12.61	1	p<.000***	.72	.27	.92	.61	.74	.23
Factor 2	1.0	.024	1	p<.877	.69	0	1	0	.69	0
Conduct Disorder										
Factor 1	.987	1.703	1	p<.192	.64	1	0	.64	0	0
Factor 2	.998	.213	1	p<.644	.64	1	0	.64	0	0
Substance Abuse										
Factor 1	.968	4.268	1	p<.039*	.61	.32	0.84	.61	.61	.16
Factor 2	.873	17.982	1	p<.000***	.68	.58	0.76	.66	.70	.35

Note. N = 125 for Violence While Incarcerated; Chronic offenders, N = 126, Sex offenders, N = 133; Mood disorder, N = 133; Conduct disorder, N = 133, Substance abuse, N = 135.

In addition to classifying offenders based upon violence criteria, this factor also correctly classified between chronic offenders, sexual offenders, and offenders with substance abuse problems. Results of discriminant function analyses for the two factors derived from the MACI scales comprising Expressed Concerns can be found in Table 13.

Factor 1 from Clinical Syndromes (Antisocial-Delinquent) correctly classified offenders with substance abuse problems, Wilk's lambda = .850. This factor correctly classified 72% of offenders with substance abuse problems with sensitivity of .63, specificity of .79, and a kappa value of .42. Factor 1 also correctly classified sexual offenders and offenders who committed violent offenses while incarcerated.Factor 2 (Depressed Mood) correctly classified offenders with mood disorder, conduct disorder, and substance abuse problems. This factor correctly classified 74% of offenders with mood disorders, Wilk's lambda = .881, sensitivity of .34, specificity of .92, and a kappa value of .31. Table 14 has complete results of discriminant function analyses for the two factors derived from the MACI scales comprising Clinical Syndromes.

I also conducted 6 additional discriminant function analyses, one analysis for each outcome criteria. In these analyses, each factor was eligible to enter the equation and was entered in stepwise fashion. These results indicate which MACI factor or factors best discriminates between the outcome variables. Two of these six analyses had two factors enter the equation. For example, Factors 6 (Antisocial-Delinquent) and 3 (Self-Defeating) best differentiated between offenders with substance abuse problems and those without (Wilk's lambda = .808, $p<.000$, 68% correctly classified, sensitivity = .60, specificity = .75, and kappa coefficient = .35). The stepwise analysis with conduct disorder was informative in that no single factor classified offenders who had this diagnosis. In the

stepwise analysis, two factors entered the equation (Depressed Mood and Poor Self-Concept) and classified conduct disordered offenders with moderate accuracy (65%, sensitivity = .91, specificity = .19, kappa = .11). Complete results of these stepwise discriminant function analyses can be found in Table 15.

Table 14. Discriminant Function Analyses for Clinical Syndrome Factors

Outcome Criteria	Wilk's Lambda	Chi Square	(df)	P value	Percent Correctly Classified	Sensitivity	Specificity	Positive Predictive Validity	Negative Predictive Validity	Kappa
Violence While Incarcerated										
Factor 1	.945	6.83	1	p<.009**	.65	.32	.86	.62	.65	.20
Factor 2	.997	.407	1	p<.524	.60	0	1	0	.60	0
Chronic Offenders										
Factor 1	.947	6.75	1	p<.009**	.58	.64	.52	.59	.56	.15
Factor 2	.993	.871	1	p<.351	.53	.70	.35	.54	.51	.05
Sex Offenders										
Factor 1	.972	3.703	1	p<.054	.82	0	1	0	.82	0
Factor 2	1.0	.022	1	p<.883	.82	0	1	0	.82	0
Mood Disorder										
Factor 1	.998	.211	1	p<.646	.69	0	1	0	.69	0
Factor 2	.881	16.48	1	p<.000***	.74	.34	.92	.67	.76	.31
Conduct Disorder										
Factor 1	.998	.270	1	p<.604	.64	1	0	.64	0	0
Factor 2	.961	5.136	1	p<.023*	.64	.99	.02	.64	.5	.01
Substance Abuse										
Factor 1	.850	21.47	1	p<.000***	.72	.63	.79	.70	.73	.42
Factor 2	.960	5.41	1	p<.020*	.64	.38	.85	.68	.63	.25

Note. N = 125 for Violence While Incarcerated; Chronic offenders, N = 126, Sex offenders, N = 133; Mood disorder, N = 133; Conduct disorder, N = 133, Substance abuse, N = 135.

Table 15. Stepwise Discriminant Function Analysis With 7 MACI Factors

Outcome Criteria and MACI Factor(s)	Wilk's Lambda	Chi Square	(df)	P value	Percent Correctly Classified	Sensitivity	Specificity	Positive Predictive Validity	Negative Predictive Validity	Kappa
Violence While Incarcerated										
Interpersonal Problems	.940	7.47	1	.006**	.65	.34	.85	.61	.66	.21
Chronic Offenders										
Antisocial Delinquent	.947	6.75	1	.009**	.58	.64	.52	.59	.56	.15
Sex Offenders										
Interpersonal Problems	.964	4.852	1	.028*	.82	0	1	0	.82	0
Mood Disorder										
Depressed Mood	.881	16.48	1	.000***	.74	.34	.92	.67	.76	.31
Conduct Disorder										
Depressed Mood & Poor Self-Concept	.934	8.93	2	.012*	.65	.91	.19	.66	.53	.11
Substance Abuse										
Antisocial Delinquent & Self-Defeating	.808	28.14	2	.000***	.68	.60	.75	.66	.70	.35

Note. N = 125 for Violence While Incarcerated; Chronic offenders, N = 126, Sex offenders, N = 133; Mood disorder, N = 133; Conduct disorder, N = 133, Substance abuse, N = 135.

Chapter 6: Discussion

The purpose of this study was to examine the utility of the Millon Adolescent Clinical Inventory in the assessment of male juvenile offenders. I attempted to address the following research questions: (1) Is there a distinctive MACI profile for juvenile offenders? (2) What is the factor structure of the MACI? (3) Are there distinctive MACI profiles associated with offense history characteristics such as a history of aggressive offending, chronic offending, or sex offending? (4) Do juvenile offenders with mental disorders such as mood disorder, conduct disorder, or substance abuse disorder have distinctive MACI profiles?

Question 1: Is there a distinctive MACI Profile for juvenile offenders?

Adolescent offenders at the RDC registered a high rate of externalizing problems on the MACI. Three MACI scales measuring antisocial behavior and disregard for ordinary societal constraints – Delinquent Predisposition (mean base rate score = 73.7), Social Insensitivity (70.7), and Unruly (68.8)– were more elevated than all other scales. Using Millon's clinical cutoffs of 75 and 85, we found that nearly half of all juvenile offenders scored in the clinical range (> 75) on the Delinquent Predisposition scale (46%), and 32% had scores of 85 or above. Scores of 85+ indicate that this was the most prominent feature of that adolescent. Similar elevations were found for scale scores on Unruly (43% above 75 and 24% above 85) and Social Insensitivity (36% > 75 and 25% > 85). These three scales had the highest mean base-rate scores for this sample. See Table 3 for a complete list of MACI scale score elevations.

Three other scales were highly elevated, Family Discord (64.2), Substance Abuse Proneness (60.2), and Impulsive Propensity (60.0); these scales identify problems

commonly associated with delinquent and antisocial youth. In addition to conduct problems, this sample of offenders had extremely negative perceptions of their family relationships, and were likely to have had symptoms and characteristics consistent with ADHD and Substance Abuse disorders.

These MACI results share similarities with other samples of juvenile offenders. Timmons-Mitchell et al. (1997) administered the MACI to 121 males randomly selected from a juvenile correctional facility. The authors reported base rate scores ranging from 16.4 (Eating Dysfunction) to 79.8 (Delinquent Predisposition), similar to our stated range of 18.8 for Body Disapproval, and 73.7 for Delinquent Predisposition. The next five highest elevations in the Timmons-Mitchell et al. study were the same as in the present sample of juvenile offenders. See Figures 1-4 for comparisons of MACI base-rate scores between studies.

There were also differences between the present study and that of Timmons-Mitchell et al. In general, Timmons-Mitchell et al.'s sample had higher base-rate scores than the RDC sample in those MACI scales measuring traits and characteristics common to juvenile offenders. Several of these differences were substantial enough to push mean scores into the clinical range. It is notable that Timmons-Mitchell et al. reported four scales with mean base rate scores above the clinical range (>74), while our sample had no mean base rate scores at that level. A comparison of validity scales between studies indicated that there were only incremental differences in the validity scales measuring overly positive, or overly negative responding. However, as seen in Table 25, Timmons-Mitchell sample did have a higher mean score for Disclosure (61 compared with 53), suggesting that offenders in that sample were somewhat more likely to be frank and

revealing in their response to MACI items. This may partially explain the relatively higher overall base-rate scores in the Timmons-Mitchell study. These two studies suggest that juvenile offenders are likely to have personality styles that include antisocial, negativistic traits. They often report family problems, are likely to have substance abuse problems, violate the rights of others, and evidence signs of impulsive behavior. At the same time, low scores on Body Disapproval, Eating Dysfunction, and Suicidal Tendencies in both samples suggest that juvenile offenders are unlikely to report concerns about body image, eating disorders, or suicidal ideation. These results suggest that these samples of juvenile offenders are more likely to present with personality traits, attitudes, and behavior consistent with externalizing problems. Although internalizing features are also present, these traits are less prominent among juvenile offenders.

While the present study shares important similarities with Timmons-Mitchell at al., these results differ somewhat from a study of juvenile offenders completed by Salekin, Larrea, and Ziegler (2002). Although these authors do not report mean base-rate scores for their sample of 92 male and female offenders, they did report that the five most elevated MACI scales were Family Discord, Depressive Affect, Doleful, Peer-Insecurity and Self-Devaluation. Only the Family Discord scale corresponds with the present findings, while the other four scales are not among the top 10 elevated MACI scales. It is possible that the inclusion of females accounted for some of these group differences.

The MACI results from the present study identify a high proportion of offenders as scoring in the clinical range on scales measuring characteristics consistent with certain Axis I mental disorders. Descriptive analyses revealed that 72% of offenders had two or

Figure 1. Validity Base Rate Scores from Two Juvenile Offender Samples

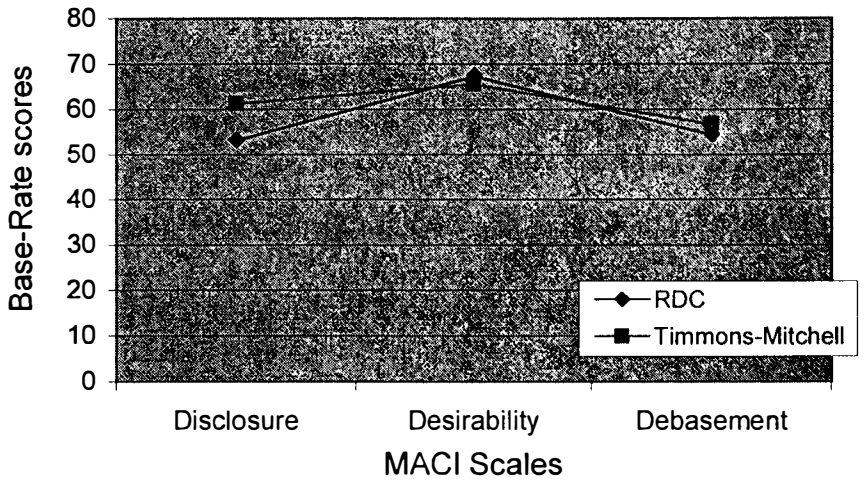


Figure 2. Personality Patterns Base-Rate Scores from Two Juvenile Offender Samples

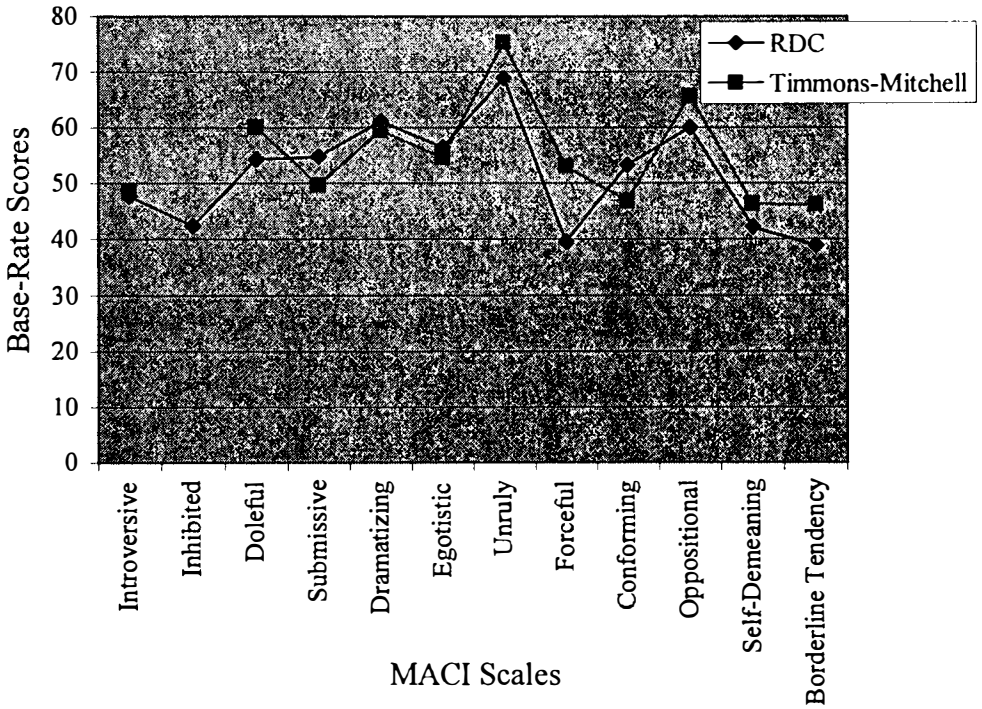


Figure 3. Expressed Concerns Base-Rate Scores from Two Juvenile Offender Samples

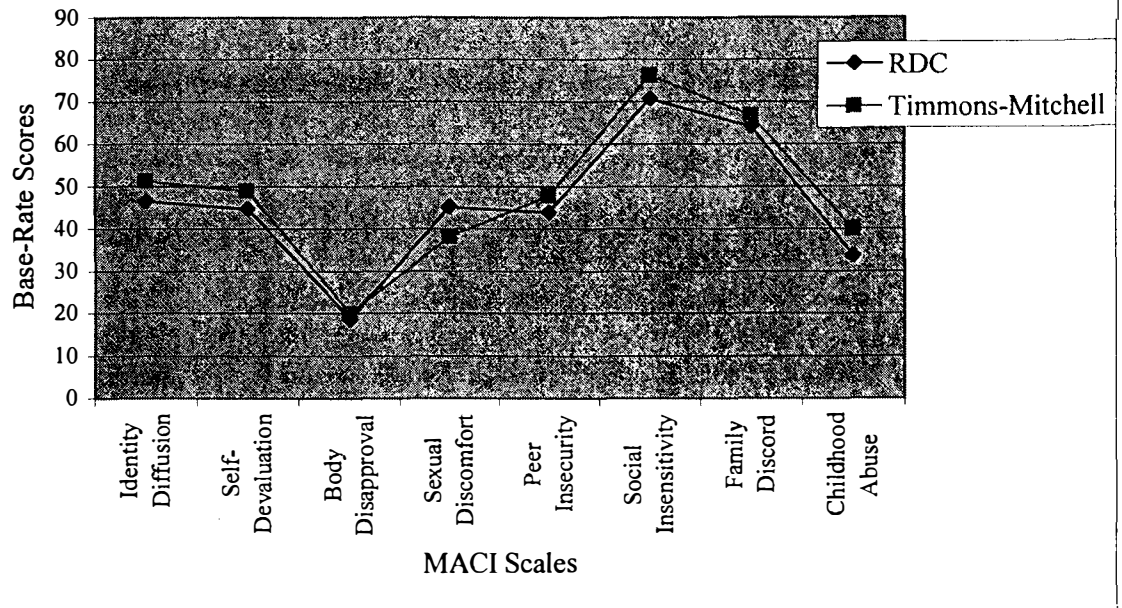
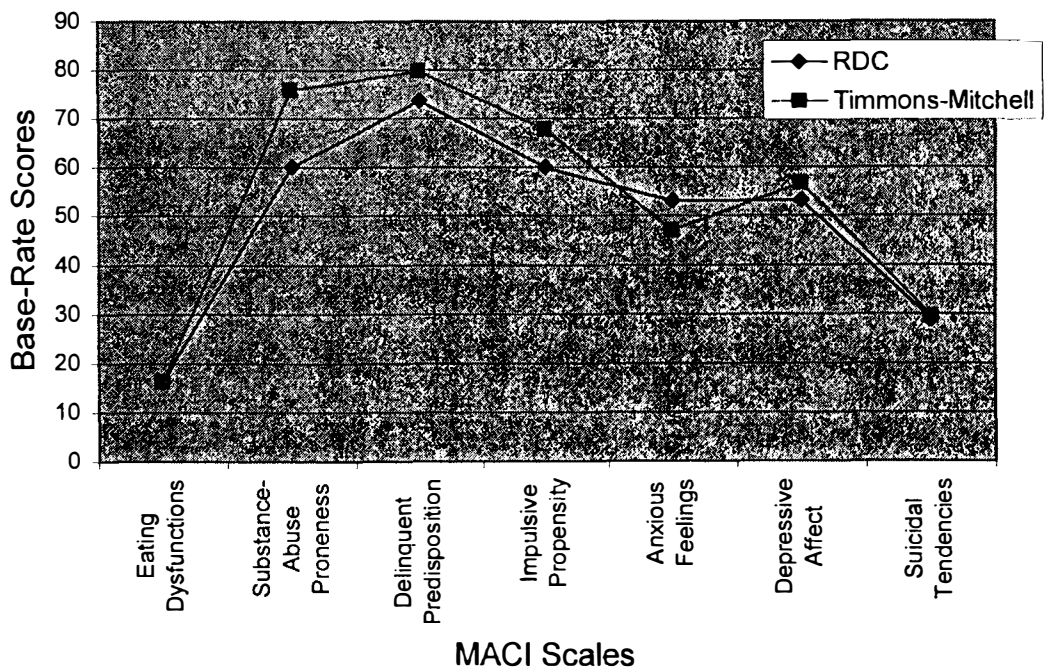


Figure 4. Clinical Syndrome Base-Rate Scores from Two Juvenile Offender Samples



more scale elevations as determined by any of 27 base rate scores above 75. Analysis of five Clinical Syndrome scales determined to be approximations of frequently diagnosed Axis I mental disorders (Impulsive Propensity, Anxious Feelings, Depressive Affect, Substance Abuse Proneness, and Delinquent Predisposition) indicated that 90 (66.7%) offenders had one or more elevations, while 55 (40.7%) had two or more elevations. See Table 1 for a complete listing of MACI scale elevations.

These findings are consistent with emerging research on the rates of mental health problems among juvenile offender populations. In a study that included 1172 male juvenile detainees, Teplin and colleagues examined the prevalence rates of comorbid psychiatric disorders as determined by the Diagnostic Interview Schedule for Children (DISC). The authors reported that 66% of male juvenile delinquents had one or more psychiatric diagnoses, and 46% of delinquents met diagnostic criteria for two or more psychiatric disorders (Abram, Teplin, McClelland & Dulcan, 2003; Teplin, 2001). The consistency between these findings and MACI results in the RDC sample are notable. It is important to note that a base rate score of 75 or higher is not sufficient information for a diagnosis and is only an approximation of rates of mental health problems. However, these findings suggest that the MACI is sensitive to measuring the types of mental health problems identified by Teplin and colleagues as the most common to this population.

Differences by age. Statistically significant age differences were found on only one MACI scale, Peer Insecurity. The general lack of age differences is likely due to Millon's adjustment for age in the norming process of the MACI. When transforming raw scores into base rate scores, Millon developed empirically generated prevalence rates of traits measured by each MACI scale for males and females between the ages of 13 and

15, and males and females between the ages of 16 and 19. This adjustment for age differences may account for the finding that only one scale had age differences. The age differences on the Peer Insecurity scale were between 16 year olds (48.9) and 13-15 year olds (35.8); both scores are well below Millon's cut-offs for clinical significance and the effect size ($eta^2 = .05$) for this difference is small. Overall, there appear to be no important age differences in MACI base rate scores for juvenile offenders in the age range considered in this study.

It is difficult to determine if substantial age differences existed before the transformation from raw scores to base-rate scores. Comparison of raw scores between groups for selected MACI scales from the validity sample yielded inconclusive results. For example, for adolescents between the ages of 13 and 15, a base-rate score of 75 on the Unruly scale was anchored at a raw score of 40, and a base-rate of 85 was set at a raw score of 43. These anchor points were determined by the prevalence data gathered from the validity sample in combination with more general epidemiological data about particular disorders. These raw scores were somewhat lower than for the group of males ages 16-19 where base rates of 75 and 85 were anchored in raw scores of 46 and 51 respectively. This suggests that given a higher prevalence rate of Unruly personality traits among 16-19 year old males, a higher number of antisocial traits must be endorsed for a 16-year-old adolescent to reach the clinical threshold determined by Millon than it would be for a 15-year-old adolescent. However, because the MACI manual does not report figures for the number of adolescents who recorded different raw or scores, it is impossible to calculate age differences prior to the transformation to base rate scores.

Differences by race. MACI clinical scale scores were analyzed for differences by race of respondents. Because Caucasian and African American offenders combined to total 91.8% of the sample, Hispanic offenders (n = 7) and offenders endorsing Other (n = 3) were omitted from the racial analyses. Significant differences ($p < .05$) were found on 14 of the 27 comparisons of Caucasian (n = 55) and African-American (n = 69) offenders. These differences were found on 6 Personality Patterns scales, 4 Expressed Concerns scales, and 4 Clinical Syndromes scales. Caucasians scored higher than African American offenders on 12 of 14 clinical scales where statistically significant differences were found ($p < .05$). When the significance level is adjusted by Bonferonni correction to a p value of .002 (.05/27), only one MACI scale maintained statistical significance, Substance Abuse Proneness ($p < .001$, $Eta^2 = .10$).

Racial differences are not easily explained and may be due to many different factors. When examining race differences, it is necessary to examine effect sizes to determine the clinical significance of group differences. Effect size provides a metric for determining the practical significance of statistical differences between groups. Effect sizes below .20 had been considered small (Cohen, 1990), and therefore risk being dismissed by researchers as unimportant. However, effect sizes of this magnitude can be associated with meaningful real-world effects and outcomes (Rosenthal, 1990). Meyer and colleagues (Meyer et al., 2001) presented evidence that a large number of important medical diagnostic procedures and treatments are associated with numerically small effect sizes as indexed by conventional measures in psychology.

In the present study, effect sizes for significant mean differences ($p < .05$) in MACI scales by race ranged from .03 (Inhibited) to .10 (Substance Abuse Proneness).

This finding is consistent with a recent meta-analysis of MMPI/MMPI-2 research on racial differences across 31 years (Nagayama Hall, Bansal, & Lopez, 1999). The authors of that study concluded that while some studies have shown that ethnic minorities scored higher on some scales and lower on other scales when compared to European Americans, these differences were found to be unimportant or negligible from both a statistical and clinical perspective (1999).

One interesting finding in the present study was that when the three validity scales were included in the analysis, the main effect was not significant ($p<.07$). Although this finding approached clinical significance, the non-significant finding suggests that as a whole, the validity scales do not contribute to differences between groups. Despite this finding, I examined validity scales for information about response styles between groups. Caucasian offenders differed significantly from African-Americans on two of three indices, and both differences were in the direction that could possibly yield higher MACI scores among Caucasians. On the Desirability scale, Caucasian offenders (63.3) were significantly lower than African-Americans (70.0), suggesting that African-American's scores were more affected by an inclination to appear socially attractive and emotionally stable. On the Debasement scale, which measures a respondent's tendency to devalue oneself, or appear more troubled than they might actually be, Caucasians scored higher than African-Americans (59.1 vs. 51.2) suggesting that Caucasians were more invested in presenting themselves as deviant or pathological than African-Americans.

While the differences in these two validity scores are notable, they do not necessarily indicate that higher MACI scale scores are the result of the validity scores. Millon developed MACI validity scales so that they share item overlap with some clinical

scales. Validity indices are interpreted in terms of their impact on clinical scales only if they reach Millon's clinical cutoff score of 85. When validity scores are less than 85, it is impossible to determine the causal effects that high validity scales have on clinical scales. Table 4 presents a summary of the comparisons between Caucasian and African American offenders on all 30 MACI scales.

Another possible explanation for the consistently higher scores for Caucasians in this study may be due to the juvenile justice setting. In general, juvenile justice agencies have a higher representation of African American youth than Caucasians, and race has been found to be a factor in sentencing and decisions to detain African-American juvenile offenders (Wordes, Bynum, and Corley, 1994; Secret & Johnson, 1997). Given the generally stronger likelihood that African Americans become incarcerated in the United States, it could be hypothesized that Caucasian youths who are incarcerated represent a more disturbed group who have higher prevalence rates of conduct problems and other associated mental health symptoms.

A recent survey with adolescent offenders on the MAYSI found results that resembled the present study's findings. In that study (Stewart & Trupin, 2002), Caucasian offenders were more likely to be in high symptom groups as measured by the MAYSI than African American offenders. The authors suggested that one explanation for the racial differences among Caucasian offenders may have been related to previous history of mental health treatment and exposure to symptom identification. Thus, the outcome variable (previous history of mental health treatment) may have influenced the way in which participants completed the MAYSI. While the present study's independent (staff diagnosis) and dependent (MACI scores) variables were uncontaminated, it is possible

that previous history of mental health treatment affected the response style of participants. Future research might control for this variable when analyzing MACI results between different groups.

Comparison with psychiatric sample. I compared the MACI results with a sample of psychiatric patients to assess differences across populations. Statistically significant differences were found between juvenile offenders and psychiatric patients on 21 of 30 MACI scales. Significant effect sizes ranged from .03 (Family Discord, Oppositional, and Social Insensitivity) to .12 (Body Disapproval and Suicidal Tendencies). Psychiatric patients had higher scores on 16 of those scales, which was to be expected given the chronic and acute nature of mental health problems inherent in a psychiatric sample.

One notable finding was the differences in each of the three validity indices. Psychiatric patients scored higher on Debasement and Disclosure, while juvenile offenders scored higher on Desirability. These trends suggest that psychiatric patients may have been more likely to appear pathological on the MACI, while juvenile offenders generally may have had a more defensive response style. However, given the overlap between clinical scales and validity scales as mentioned previously, it is impossible to draw clear conclusions from the mean differences in validity scores that do not reach Millon's clinical cutoff of 85.

Both samples contained youth who endorsed high rates of rebellious and antisocial traits, along with a tendency to act out in ways that violate the rights of others. Thus, Unruly and Delinquent Predisposition scales were among the most elevated scales for both groups. An interesting and unexpected finding was that psychiatric patients also scored significantly higher on selected scales associated with delinquent behavior such as

Forceful (adolescents who have domineering and hostile personality traits) and Oppositional (adolescents described as irritable, unhappy, and sullen).

I conducted a 2 x 2 MANOVA to examine the impact that racial differences had on group membership. When race was partialed out of this analysis, differences between the juvenile offender and psychiatric sample were somewhat attenuated. Fifteen scales maintained clinical significance when corrected for race, and psychiatric patients had higher mean scores on twelve. The greatest differences between the two samples were on those MACI scales measuring depressive features including Depressive Affect (eta^2 = .10), Suicidal Tendency (.12), and Body Disapproval (.12). Psychiatric patients had significantly higher scale scores than juvenile offenders on all three scales.

Question 2: What is the factor structure of the MACI?

This study originally proposed to employ discriminant function analyses using the MACI's 27 clinical scales as independent variables to classify offenders into different groups. However, discriminant analyses involving 27 scales would have the effect of reducing statistical power due to the higher possibility of Type I error. I conducted an exploratory factor analysis as a way to reduce the number of clinical scales entering each analysis.

One previous study (Salekin, 2002) conducted a factor analysis of the MACI with a juvenile offender population. Rather than conduct a single factor analysis of all 27 scales, Salekin chose to conduct separate factor analyses for each of the three groupings of scales as defined by Millon: Personality Patterns, Expressed Concerns, and Clinical Syndromes. The author reported that two factors emerged from each analysis, yielding a total of six factors.

In the present study, a confirmatory factor analysis was conducted to determine the fit of Salekin's model with the present data set. Statistically, the analyses revealed that each of Salekin's two-factor solutions were a poor fit with our data. A factor analysis is considered to be a good fit when GFI and CFI statistics approach .9. The present analyses ranged from .46 - .80. Similarly, RMSEA statistics indicate a good fit when values are > .05 and the present figures ranged from .20 - .32. As a result of these findings, exploratory factor analyses were conducted in the same manner as Salekin to determine the appropriate factor structure for this sample of juvenile offenders.

Exploratory factor analyses. Three separate factor analyses were conducted to reduce the MACI data. In the analysis for the 12 Personality Patterns scales, a three-factor solution emerged that accounted for 81.9% of the variance. The factor analysis conducted on the 8 Expressed Concerns scales revealed a two-factor solution that accounted for 65.6% of the variance. The seven scales that comprise Clinical Syndromes broke into two factors that accounted for 77.5% of the variance. Only three of 27 clinical scales had co-occurring factor loadings greater than .5, suggesting that factors are distinct from each other and broke out cleanly.

Personality patterns. The 12 Personality Patterns scales were best accounted for by three factors. Factor I had positive loadings from the Forceful, Unruly, Oppositional, and Borderline Tendency scales, and negative loadings from the Submissive and Conforming scales. These loadings contributed to the conceptualization of this factor as a measure of aggression. Of all the Personality Disorders defined by DSM-IV, Antisocial Personality Disorder may have the most direct links to this factor, which included aspects

of individuals who may act out negative emotions, have a dominant personality style, and freely violate the rights of others as a means of achieving their goals.

The Attention-seeking factor (Factor II) had positive loadings from the Dramatizing and Egotistic scales, and negative loadings from the Introversive and Inhibited scales. This factor also appeared to measure expressive and externalizing personality styles that may be less aggressive than those described by Factor I. Instead, this factor appeared to measure dramatic, extroverted, uninhibited, self-centered personality traits.

Factor III had four positive loadings from Self-Demeaning, Doleful, Borderline Tendency, and Oppositional scales. This factor appeared to measure Self-defeating personality traits as indicated by two scales measuring externalizing personality traits (Oppositional, Borderline Tendency) paired with two scales measuring depressive traits (Doleful, Self-demeaning). The highest loading came from the Self-Demeaning scale (.88). Millon described adolescents who score high on this scale as their own worst enemies, whose behavior is often self-defeating, and who appear content to experience suffering (Millon, 1993).

The twelve Personality Patterns scales loaded uniquely onto these three factors with the exception of two scales that cross-loaded. The Oppositional and Borderline Tendency scales loaded onto both Factors I and III. Factor I was a clear measure of aggressive tendencies, and individuals scoring high on this factor may have personality styles that are dominant and forceful, with antisocial and aggressive tendencies. Factor III appeared to measure personality styles with less aggressive tendencies, but who may exhibit oppositional and unpredictable behavior along with underlying depressive

personality traits. This combination of depressive features and disruptive behavior is indicative of adolescent depression as defined by DSM-IV, which includes irritability and oppositional behavior in its symptom checklist for depression. The significance of these co-occurring scales is that they may be reflecting an important distinction between a subset of externalizing offenders. Offenders with more focused aggressive tendencies with the absence of depressive features, that is those scoring high on Factor I, are likely to be more violent, and have poorer outcomes than offenders whose externalizing behavior is better accounted for by depression. Some research on violent offending suggests that this distinction plays an important role in determining which offenders go on to become career offenders, and which offenders begin and end their offending careers in adolescence. While no single measure alone is sufficient in differentiating between these types of offenders, it would be interesting to explore the possible contributions of these MACI factors in assisting clinicians differentiate between types of violent offenders.

Expressed concerns. The Expressed Concerns scales are intended to measure clinical phenomenon and personal concerns considered to be most relevant to clinical samples of adolescents. The eight scales in this dimension broke out into two factors. Factor I appeared to be a measure of Poor self-concept with significant positive loadings from 5 scales. Offenders scoring high on this factor have low self-esteem, a strong likelihood for experiencing child abuse, poor body image, and insecure relationships with peers. Youth scoring high on this factor may also struggle with identity formation.

Factor II represented youth with interpersonal problems as evidenced by high scores on a measure of family problems, a low degree of sexual discomfort, and social

insensitivity. Youth scoring high on this factor reported identity problems. These traits cluster together to describe a subgroup of youth with unstable family histories, a general indifference to the feelings and reactions of others, and a poor sense of who they are in relation to others. Additionally, youth scoring high on this factor also reported a low degree of sexual discomfort, which may reflect a tendency towards sexual promiscuity. It is likely that significant interpersonal problems will result when the combination of low empathy and indifference towards others is paired with a history of inconsistent parenting and family conflict (Broidy et al., 2003; Gorman-Smith et al., 1996). As will be discussed, this factor is an important one from a clinical perspective as it correlated significantly with five different outcome measures.

Clinical syndromes. The variance for the seven scales that comprise Clinical Syndromes was best explained by two factors. There were no cross-loadings for either factor and the combined variance explained was 77.5%. Factor I, Antisocial-delinquent, accounted for the most variance of any of the seven factors (46.7%). The scales that load onto this factor measured traits common to violent juvenile offenders, including predisposition towards delinquency, impulsivity, substance abuse, and low levels of anxiety. Factor II consisted of three scales and represented a measure of depressed mood. The Depressive Affect scale and the Suicidal Tendency scale clearly measure aspects of depressive behavior and suicidal ideation and/or behavior. The other MACI scale that loaded onto this factor is the Eating Dysfunction scale. Diagnostic criteria for depression include eating problems and marked change in appetite which are traits measured by this scale.

Comparison with Salekin's factor analyses. There are important similarities and differences between the present factor structure, and that found by Salekin. The factor analysis of the 12 Personality Patterns scales held the most noteworthy difference between the two studies. Salekin reported that two factors emerged, one that measured internalizing symptoms, and a second that represented a Forceful, Unruly, and Dominant personality style. The present findings supported a three-factor solution that differed conceptually from Salekin's two factors. While Salekin's Forceful, Unruly, and Dominant factor is similar to the present study's Factor I (Aggressive), there were substantial differences between Salekin's Internalizing factor and the present study's Factor II (Attention-Seeking), and Factor III (Self-Defeating).

Salekin's Internalizing factor had significant loadings from 9 of the 12 Personality Patterns scales, and accounted for 54.4% of the 67.8% variance explained by this analysis. In the RDC analysis, two factors emerged from these nine scales that appeared to describe different personality traits than an Internalizing factor alone. The present study's Factor II (Attention-seeking) for example, is not consistent with a purely internalizing personality style, as evidenced by dramatic, self-centered, and extroverted traits. These traits seem more consistent with an individual who freely expresses their thoughts and feelings, strives to be the center of attention, and tends to be disruptive in group activities. This factor appeared to represent those offenders who conceptually, may fall between an internalizing youth who tends to avoid contact with others, and an externalizing youth who acts out aggressively towards others. Thus, while youth who scored high on this Attention-seeking factor may be expressive and disruptive, there is a notable absence of violent or aggressive tendencies. Current analyses show that there are

no statistically significant correlations between the Attention-Seeking factor and this study's measures of violence (Violence while incarcerated r=-.07, OAS Aggression r=-.02). This type of offender may play a big role in disrupting the institutional milieu, but by MACI profile, is unlikely to commit violent acts. Given the reported personality traits of these offenders, it could be hypothesized that they are more likely to be the victim of institutional violence than instigators. More research on this MACI factor is necessary to explore its utility in identifying victims of institutional violence.

The third factor from the RDC factor analysis (Self-Defeating) shared similarities with Salekin's Internalizing factor. However, rather than a pure measure of internalizing traits, the Self-Defeating factor appeared to be more reflective of a DSM-IV characterization of adolescent depression (which includes irritability and oppositional behavior) as indicated by the presence of Oppositional and Borderline Tendency loadings. By contrast, in Salekin's analysis, these scales loaded onto his Factor I (Forceful, Unruly, Dominant), and not his Internalizing factor.

The fundamental difference between the Expressed Concerns factors described by Salekin (Identity Confusion and Social Sensitivity) and the present study's factors (Poor Self-Concept and Interpersonal Problems) involved the Social Insensitivity scale. This scale was developed by Millon to measure indifference towards the feelings or thoughts of other people, and has been found to be associated with aggressive behavior while incarcerated (Caggiano) and psychopathy (Cornell & Murrie, 2000). In the present study, the Social Insensitivity scale loaded significantly onto the Interpersonal Problems factor, along with scales measuring family problems, sexual promiscuity, and identity confusion. This combination of scale loadings contributed to this factor's consistent association with

aggressive behavior and violent offending. By contrast, Salekin's Identity Confusion factor is similar to the present study's Interpersonal Problems factor minus the significant loading from the Social Insensitivity scale. This appears to result in a measure of adjustment or identity problems which Salekin describes as an indicator of a lack of confidence towards one's own goals or identity, as well as withdrawal, diffuse unruliness, and general resentment towards others (Salekin, p. 26). This difference in Expressed Concerns factor structure between studies appears to be important given the consistent relationship and predictive utility of the present study's Interpersonal Problems factor with different violence criteria.

The factor analyses of the Clinical Syndromes scales yielded factors that were similar to those reported by Salekin. Salekin's Psychopathic Precursors factor and the present study's Factor VI (Antisocial-Delinquent) each had significant loadings from four MACI scales, Delinquent Predisposition, Substance Abuse Proneness, Impulsivity, and Anxious). Salekin's Internalizing factor has clear similarities with the present study's Factor VII (Depressed Mood) as evidenced by significant loadings from Depressed Affect (present study's factor loading = .91, Salekin's factor loading = .90), Suicidal Tendencies (.78/.79), and Eating Dysfunction (.64/.56).

It is not uncommon for factor analysis studies to report different factor loadings when different samples are utilized. Accounting for differences in factor loadings is very difficult. One possible reason for differences in MACI factor structure between studies are in the different samples. Salekin's sample included both boys and girls, while the present sample was limited to boys. Additionally, the RDC sample included those males already sentenced to serve time for criminal acts, whereas Salekin's sample included

youth who were referred to a juvenile court assessment center for a variety of offenses including property offenses, theft, and offenses against persons. Salekin's sample would have encompassed a range of youth including some who may be diverted from incarceration, placed on probation, or found innocent of their charges.

Statistical differences provide another important distinction between studies. Although both studies employed varimax rotation and retained factors based on examination of scree plots and eigenvalues greater than 1.0, the studies differed in the factor extraction technique utilized. The present study employed principal components factoring, whereas Salekin utilized principal axis factoring. In either approach, the variance which is analyzed is the sum of the values in the positive diagonal of the correlation matrix. Principal components factoring accounts for all the variance, including error and unique variance, by placing1's in the diagonal. Principal axis factoring places estimates of shared variance in the diagonals. These estimates of shared variance, or communalities, are derived through an iterative procedure and exclude error and unique variance from the analysis. This is done on the belief that such variance only confuses the picture of underlying processes. Thus, the difference between the two approaches is that principal axis factoring provides a theoretical solution uncontaminated by unique and error variability (Tabachnick & Fidell, 1989).

The present study attempted to use principal axis factoring to mirror Salekin's study. However, in one analysis (Expressed Concerns), communalities in the correlation matrix exceeded 1.0, and the procedure was terminated. Principal components analysis was therefore used in its place. Principal components factoring is considered the solution of choice for reducing a large number of variables down to a smaller number of

components, and may be the preferred choice in providing researchers with an empirical summary of a data set (Tabachnick & Fidell, 2001). However, given the difference with Salekin's analyses, this difference in factor extraction techniques may explain some of the differences in factor results between studies.

Romm factor analysis. Romm, Bockian, and Harvey (1999) investigated the factor structure of the MACI among 251 adolescents in residential treatment. Comparisons between Romm's factor analysis and the current study's analyses are difficult due to a fundamental difference in the way the analyses were conducted. Romm conducted one factor analysis in which all 30 MACI scales were eligible for entry into the factor matrix. The present study conducted three separate factor analyses to accommodate Millon's groupings of the MACI clinical scales by Personality Patterns, Expressed Concerns, and Clinical Syndromes, consistent with the approach taken by Salekin. This approach separated the scales as Millon intended, and is consistent with much of the factor analytic literature involving the MCMI-II, in which researchers typically conduct separate analyses for clinical and personality scales (Dozois & Kelln, 1999; Retzclaff & Gibertini, 1990).

Despite this fundamental difference in analysis strategy, there were some theoretical similarities between the two factor analyses. Romm & Bockian reported that a five-factor solution was the best fit for their data. Factor 1, Defiant Externalizers explained the most variance (25.1%) and was the dimension characterized by adolescents with multiple problems with authority, school figures, or their parents. This factor appeared to have significant overlap with aspects of RDC's Factors I (Aggressive), V (Interpersonal Problems), and VI (Antisocial Delinquent). These three factors are

comprised of 14 MACI scales, 11 of which are represented by Romm & Bockian's Defiant Externalizers factor. Similarly, Romm & Bockian's factor 2 (Intrapunitive Ambivalents) accounted for 23.9 % of the variance and represents internalizing youth often diagnosed with depression. The MACI scales loading onto this factor are also found in the present study's factors III (Self-defeating), IV (Poor self-concept), and VII (Depressed Mood).

Question 3: Are there distinctive MACI profiles associated with offense history characteristics? We explored the utility of the MACI in discriminating between different types of juvenile offenders including violent, chronic, and sex offenders. I examined the correlations of MACI scales and factor scores with offense history variables. I then assessed the ability of the seven MACI factors to classify offenders by offense characteristics.

Can the MACI discriminate between violent and nonviolent offenders? It is important for juvenile institutions to identify offenders who are likely to act violently. MACI scales and factors were consistently correlated with two different violence variables; staff report of aggression using a modified version of the OAS Aggression Scale, and incident reports of violence while incarcerated. The MACI did not correlate with a measure of instrumental versus reactive aggression or with a scale of the severity of violent offenses committed prior to incarceration.

Violence While Incarcerated. Each of the three subgroups of MACI scales (Personality Patterns, Expressed Concerns, and Clinical Syndromes) had a representative factor that correlated significantly with the violence while incarcerated variable. The significant correlations ranged from .22 to .28. Aggressive offenders had higher scores on

scales measuring symptoms consistent with Axis I disorders such as substance abuse, conduct problems, and impulsivity. These offenders typically scored low on scales measuring anxiety, submissive and conforming behavior, and tended to demonstrate behaviors and personality traits of a dominant, forceful nature with little regard to the rights or feelings of other people. Additionally, while these offenders may not be best characterized by depressed mood, they tended to have elevated scores on some scales measuring traits and beliefs consistent with depression including self demeaning, self devaluation, and suicidal ideation.

The present study's results supported some existing research on the MACI and violent offenders. Caggiano studied juvenile delinquents that committed violent acts towards staff members. The author hypothesized that these delinquents had elevated scores on three MACI scales that measured characteristics consistent with psychopaths; the Social Insensitivity scale, and the Forceful and/or Unruly scales. Caggiano found that these three scales postdictively assigned 100% of delinquents in his sample to the correct violent towards staff (n = 12) or non-violent towards staff (n = 56) group. Caggiano (2000) also reported that these three scales, along with three additional scales that shared theoretical similarities with a "psychopathy taxon" (Delinquent Predisposition, Impulsive, Submissive) also postdictively assigned all 68 juvenile delinquents to the correct violence towards staff group.

In the present sample, these three scales were all significantly correlated with violence while incarcerated (Forceful = .24, Unruly = .23, Social Insensitivity = .20). These MACI scales loaded onto the two factors (Forceful and Unruly with the Aggressive factor, and Social Insensitivity with the Interpersonal Problems factor) that

correlated most strongly with the violence while incarcerated variable (.24 and .28 respectively). Classification results from the present study further support Caggiano's findings. In the present study, the Social Insensitivity, Forceful, and Unruly scales correctly classified 63.7% of offenders who committed a violent act while incarcerated. Similarly, of the seven factors, Interpersonal Problems best classified offenders as violent or nonviolent with a classification accuracy of 65% (sensitivity = .34, specificity = .85, and kappa = .21). These findings provide support for the predictive validity of the MACI in relation to violent infractions while incarcerated.

One caveat concerns the predictive versus postdictive nature of this analysis. Researchers for the present study attempted to obtain MACI data for participating offenders approximately one week after their arrival at the RDC. Because dates that institutional violence occurred were not recorded, it is possible that some violent infractions were committed prior to MACI administration. In these situations, the results would support the MACI's concurrent or postdictive validity. However, it is believed that most violent infractions occurred after the MACI administration.

Although these accuracy rates are lower than Caggiano's findings, this may be due to differences in the violence criteria used in the two studies. I classified offenders as violent while incarcerated based on chart reviews that indicated disciplinary infractions involving aggressive behavior or violation of the rights of others. For the present study, 50 out of 124 (40%) offenders met criteria for committing violent acts while incarcerated, while Caggiano identified only 12 out of 68 (18%) delinquents who aggressed against staff. It is likely that offenders committing violence towards staff are a more aggressive subset of violent offenders who score higher on MACI scales measuring insensitivity to

the welfare to others, as well as antisocial and hostile personality traits than offenders exhibiting a broader range of violent behavior. Despite these differences, it appears that the present results provide general support for Caggiano's findings.

Due to the important nature of violent behavior for institutions, a third analysis was conducted in an attempt to improve classification rates of violent offenders. Clinicians using the MACI frequently utilize Millon's cutoffs of 75 (where a trait is considered clinically significant) and 85 (where a trait is considered the central feature for that adolescent). Some MACI studies conducted similar analyses based on these cutoff scores. For example, Hiatt & Cornell (1999) examined whether a cutoff of 75 on the Doleful scale classified psychiatric patients as depressed. To assess the utility of these cutoffs with this juvenile offender sample, MACI scales that correlated highest with our violence criteria were analyzed, including Forceful, Social Insensitivity, Unruly, Delinquent Predisposition, and Impulsive Propensity. Because relatively few juveniles scored above the conventional cut-off of 75, we investigated the possible value of a third cutoff score of 65.

Clinicians using the MACI may be most interested in identifying optimal cut-scores that maximize sensitivity, or the ability of the instrument to detect true cases. Manipulating the cut-scores based on Millon's cutoffs increased the sensitivity of the MACI considerably. As stated previously, the Interpersonal Problems Factor was the most effective MACI factor in differentiating between offenders who commit violence while incarcerated and those who do not. Overall classification accuracy was 65% and specificity was 34%. By contrast, using a cutoff of 75 on the Delinquent Predisposition scale, sensitivity was 54%. Using an even lower cutoff of 65 on this scale yielded a

sensitivity rate of 72%. That is, of the 50 offenders who committed a violent act while incarcerated, 36 had base rate scores of 65 or higher. This increased sensitivity came at the expense of specificity (34%), which means that 49 offenders who did not commit violent acts during their stay were falsely predicted to do so using this cutoff. Table 18 summarizes the classification accuracy and sensitivity rates of selected MACI scales using these cutoffs.

Staff reported OAS aggression. To further support the MACI's utility in measuring aggression, I included another measure of aggressive behavior in the present study. Corrections staff who interacted most closely with juvenile offenders at the RDC completed a survey of aggressive behavior, the Overt Aggression Scale. For the present study, the OAS was modified to exclude incidences of verbal aggression or aggression against self. The result is a measure of more heightened aggressive behavior that was committed against objects, peers, or staff. Staff reports of aggressive behavior provided an objective rating of aggression that was not dependent on institutional records.

Results indicate that staff ratings of aggression correlated significantly with the same three factors that correlated with violence while incarcerated, Aggressive, Interpersonal Problems, and Antisocial-Delinquent. The range of correlations for these analyses was .18 to .28 with effect sizes ranging from .03 to .08. Despite some similarities between these two violence criteria, these variables were not significantly correlated with each other ($r = .09$) suggesting that they are measuring different aspects of aggressive behavior. OAS ratings may reflect a more general rating of disruptive behavior, whereas violence while incarcerated may include those offenders who committed more extreme infractions that merited an official disciplinary action that was

recorded in offender's charts. These findings provide support for the MACI as a measure of violent behavior in juvenile institutions, whether it is judged by staff ratings of general aggressive behavior or by documented incidents of violence.

Together, the results of both sets of violence analyses provide clinicians with information about some of the characteristics of those offenders who commit violent acts while incarcerated. In general, their positive correlations with the Forceful scale, and negative correlations with the Conforming and Submissive scales, indicate personality styles marked by antisocial tendencies, lack of social connection to others, and noncompliance with authority. These offenders do not seek attention or approval from others, demonstrate a lack of empathy and may have a history of sexual promiscuity. Axis I disorders that may be most common to this group are ADHD, Conduct Disorder, and Substance Abuse.

The majority of MACI scales, and all MACI factors that correlate with these two violence criteria, do not correlate with measures of depression. Thus, despite the tendency of depressed adolescents to display irritability and oppositional behavior, depressive traits may be an indicator of a lower likelihood to commit violence while incarcerated. A review of offenders who committed violent behavior while incarcerated, for example, revealed that while 22 out of 50 violent offenders had base-rate scores over 84 for Delinquent Predisposition, only 4 out of 50 had scores over 84 on the Doleful scale.

Instrumental or reactive violence. Instrumental and reactive violence were coded by chart review. Offenders were coded as instrumental if some form of instrumental violence was inferred from police reports of charges. The use of records in coding this

variable may have introduced a high rate of error into the data. It is possible that youth coded as reactive had committed an instrumental crime that was not reported to the police or not adequately recorded in the youth's file.

Results suggest that MACI factors were only minimally useful in differentiating violent offenders by instrumental versus reactive violence. A MANOVA comparing scores on the seven MACI factors between offenders coded as instrumental or reactive was not significant ($F(7, 68) = 1.18$, $p = .33$). Thus, while differences have been found in psychopathy scores between offenders classified as instrumental and reactive, I found no discernable difference when broader MACI criteria were used. However, the MACI factor most associated with aggressive behavior (Interpersonal Problems) was able to distinguish between instrumental and reactive offenders. Factor V, Interpersonal Problems, differentiated between these two groups (Wilk's lambda = .934). Classification accuracy was only 61%, while sensitivity = .62, specificity = .57, positive predictive validity = .71, negative predictive validity = .49, kappa = 20.

Can the MACI discriminate between sex offenders and non-sex offenders? In general, the MACI did not prove to be useful in distinguishing sex offenders from non-sex offenders. The only significant correlation between MACI clinical scales and sex offenders was with the Sexual Discomfort scale (.22). Despite the positive correlation, only one sex offender scored in the clinical range (>75) on this scale, and no sex offenders had a base rate score of 85 or higher on this scale. Thus, while sex offenders had generally higher base rate scores on this scale, the cutoffs prescribed by Millon were not a useful indicator in identifying sex offenders in this sample.

While this finding was surprising, there is no evidence in the MACI literature that the Sexual Discomfort scale was constructed to measure sexual offending. Millon described the scale as a measure of the ease and rate of transition from the sexual attitudes and experiences of childhood to a more mature expression of sexuality. Millon stated that adolescents scoring high on this scale, "find sexual thoughts and feelings confusing or disagreeable. They are troubled by their impulses and often fear the expression of their sexuality. They are either preoccupied with or in conflict over the roles their sexuality may require" (Millon, 1993, p. 48).

Given Millon's explanation, it is possible that many sexual offenders would not have elevated scores on this scale. For example, Worling found support for a general taxonomy of juvenile sex offenders that included four major types, Unusual/Isolated, Overcontrolled/reserved, Antisocial/Impulsive and Confident/Aggressive (2001). Given Millon's description of the Sexual Discomfort scale, it could be hypothesized that the scale would be more sensitive in identifying Unusual/Isolated and Overcontrolled/reserved offenders than either Antisocial/Impulsive or Confident/Aggressive offenders. Additionally, it could be hypothesized that the Sexual Discomfort scale in conjunction with the Forceful, Social Insensitivity, and Impulsivity scale would be better able to identify a broader range of sexual offenders than it would be by itself. Further research is necessary to clarify how the Sexual Discomfort scale could be useful in identifying sex offenders either alone or in combination with other MACI scales.

MACI validity indices were examined to rule out high rates of defensive responding as a possible explanation for the generally lower scale scores among this

subgroup of offenders. Comparisons of MACI Disclosure scale (willingness to reveal negative traits) and Desirability scale (Faking good) were made between sex offenders and non-sex offenders. T-tests revealed no statistically significant differences between the groups on either scale. Two sex offenders (8%) scored over 75 on the Disclosure scale while 21 (19%) non-sex offenders did. Seven sex offenders scored above that threshold (29%), contrasted with 40 non-sex offenders who scored above that threshold (37%).

I examined the frequency of elevations on any MACI clinical scale (> 85) among the 24 offenders with sex offenses. The MACI scales most often elevated among this group included Delinquent Predisposition (n = 6, 25%), Unruly (n = 4, 17%), Family Discord (n = 4, 17%), Social Insensitivity (n = 4, 17%), and Anxious Feelings (n = 4, 17%). All but the Anxious Feelings scale are among those most commonly elevated among the general samples of juvenile offenders reported in the present study and by Timmons-Mitchell et al. These results suggest that although general scores were not as elevated, sex offenders did have clinically significant MACI scores on scales typical of non-sex offenders. Thus, these MACI scales did not differentiate between sex offenders and non-sex offenders as other instruments have shown.

Sex offender scores on the MACI correlated with only one factor, Interpersonal Problems (-.19). The negative correlation suggested that in general, sex offenders in this sample are unlikely to be overtly aggressive or to identify themselves as having problems with others. However, rates of committing violent acts while incarcerated were similar for sex offenders (39%) and non-sex offenders (40%). A step-wise discriminant function analysis was conducted to determine the MACI factor that best differentiated between sex

offenders and non-sex offenders. The Interpersonal Problems factor emerged as the best predictor of sexual offending. However, sensitivity was 0, suggesting that the MACI was unable to accurately classify these offenders by sex offender status. Losada-Paisey demonstrated that the MMPI-A was successful in classifying 71% of sexual offenders, and 77% of non-sexual offenders, resulting in a 75% overall classification rate. When compared to these findings, it appears that the MACI is not sensitive to the differences between sex offenders and non-sex offenders.

Can the MACI discriminate between chronic and non-chronic offenders? At the RDC, all offenders were given a chronicity score which is determined by the number and severity of prior offenses. Very different profiles emerged when comparing chronic offenders with MACI scales or with MACI factors. Scale score correlations suggested chronic offenders were dominant and non-conformist, had low anxiety, and reported traits and behaviors consistent with substance abuse and impulsivity. Individual MACI scales measuring aggression did not correlate with chronicity. However, analysis of factor scores presented a different picture as chronic offenders had significant correlations with three factors measuring aspects of aggressive and antisocial traits; Factor I (Aggressive, r=.21), Factor V (Interpersonal Problems, r=.22), and Factor VI (Antisocial Delinquent, r=.23).

I examined the frequency of MACI scales with the most clinical elevations ($\geq$ 75) among chronic offenders. Chronic offenders were most likely to have elevations on the Unruly scale, as 35 of 66 chronic offenders had base-rate scores of 75 or greater. Other MACI scales with frequent elevations were Impulsivity (n = 33), Delinquent Predisposition (n = 32), and Substance Abuse Proneness (n = 30). Using the base-rate

cutoff of 75 as a screen for chronic offenders yielded sensitivity levels ranging from .45 to .53 using these three MACI scales. Finally, chronic offenders scoring over 85 on these MACI scales were compared to chronic offenders scoring below 75 to determine if the MACI could detect meaningful differences between these groups. Substance Abuse Proneness was the only MACI scale where statistically significant differences were found between chronic offenders scoring high on the MACI and those scoring below clinical cutoffs ($t = 2.78$, $p < .002$).

In the present study, I examined the utility of MACI data to postdict chronicity status. Factor V, Interpersonal Problems was best able to classify offenders into correct groups based on their chronicity scores (Wilk's lambda = .947, percent accuracy = .58, sensitivity = .64, specificity = .52, kappa = .15). However, these analyses were retrospective, whereas a more important benefit of an instrument is its prospective ability to predict which young offenders are most likely to develop into chronic offenders. Smith and Alessi (1999), for example, reported that a 12-item prospective instrument was able to predict chronic offending with a good degree of accuracy (ROC analysis area under the curve = .69). The authors' instrument consisted of a tabulation of 12 risk factors associated with recidivism where the presence of factors such as early onset of court docketing, parental criminality, impulse control problems, and substance abuse all added a point to the total score (range from 0 – 14). While this instrument is focused more on profile data, psychosocial factors addressed by the MACI such as impulsivity, physical abuse history, and substance abuse history were also included in the measure's tabulation. Future research might explore whether optimal cutoff scores on specific MACI scales and

factors might improve this instrument's ability to predict which offenders may develop chronic offense histories.

Question 4: Do juvenile offenders with mental disorders have distinctive MACI profiles?

I explored the MACI's correlations with common mental health problems among juvenile offenders. These relationships were analyzed at a MACI scale level and then with the seven factors. I then assessed the MACI factors' utility in discriminating between offenders with and without these mental health problems.

Conduct disorder. For the present study, I determined the absence or presence of Conduct Disorder based upon the diagnostic impressions of the RDC Behavioral Services Unit Staff. This outcome criterion was notable in that it was correlated with only two of the 27 MACI clinical scales (Doleful = .18 and Depressive Affect = .24). Similarly, only two of the 27 MACI scales accurately distinguished between offenders with and without conduct disorder diagnoses, and none of the seven factors predicted group membership on their own. However, a stepwise discriminant function analysis, two factors (Depressed Mood and Poor Self-Concept) discriminated between groups (classification accuracy = 65%).

One likely reason why the MACI was not sensitive to a diagnosis of Conduct Disorder is the restricted range of this diagnosis among this sample of juvenile offenders. Sixty-three percent of offenders met diagnostic criteria for Conduct Disorder, and an additional 29% met criteria for the related diagnosis of Oppositional Defiant Disorder. Thus, over 90% of all offenders met full DSM-IV diagnostic criteria for one of the two major behavioral disorder diagnoses. These rates are consistent with other studies of

juvenile offenders (McManus, Alessi, Grapentine, and Brinkman, 1984; Milin, Halikas, Meller, and Morse, 1991).

While conduct disorder alone does not appear to be a useful variable among offenders, because it is so prevalent, it has been shown to have some utility when considered as comorbid diagnostic picture. Studies have examined conduct disorder diagnoses in conjunction with depressive disorders, substance abuse problems, and ADHD. Offenders with comorbid diagnoses were found to have more severe depressive symptoms, earlier onset of conduct problems, and increased incidence of substance abuse problems when compared to offenders without comorbid diagnoses (Forehand, Wierson, Frame, Kempton, & Armistead, 1992; Rhode, Mace, & Seeley, 1997; Thompson, Riggs, Mikulich, and Crowley, 1996). Two comorbid variables were created to compare with existing literature on conduct disorder and comorbidity. However, measures of conduct/mood disorder and conduct/substance abuse disorder did not account for more variance than mood or substance abuse disorders alone.

One subset of conduct disorder that has received attention recently in juvenile offender literature is adolescent psychopathy. Adolescent psychopathy is a controversial diagnosis because it has potentially serious connotations and might prejudice juvenile authorities in their decision-making about juvenile offenders carrying this label. There is not sufficient evidence that psychopathy exists as a stable condition that can be identified in early adolescence and persists into adulthood, or that a diagnosis in early adolescence has the same implications as an adult diagnosis of psychopathy; nevertheless, there is growing evidence that psychopathy traits can be reliably measured in adolescence and that psychopathy scores are linked to violent behavior (Murrie, Cornell, Kaplan,

McConville, & Levy Elkon, 2004). Youth with psychopathic-like personality traits are more likely to be violent offenders, have histories consistent with chronic offending, commit violent behavior in the institution, and are more likely to be recidivists (Brandt, Kennedy, Patrick, and Curtin, 1997; Forth, Hart, and Hare, 1990). While a personality inventory such as the MACI alone is not sufficient to determine psychopathy, there is some evidence supporting its use as a measure of psychopathic personality traits. Murrie and Cornell (2000) found that specific MACI scales and a subset of MACI items correlated significantly with a measure of psychopathy among a sample of adolescent psychiatric patients.

The present study did not attempt to address psychopathy among juvenile offenders as this topic is reported elsewhere (Murrie & Cornell, 2002). However, clinicians using the seven MACI factors to evaluate juvenile offenders will find that the six MACI scales found to be most associated with psychopathy (Substance Abuse Proneness, Unruly, Delinquent Predisposition, Forceful, Impulsive Propensity, and Social Insensitiviy) load onto three different MACI factors (Aggressive, Interpersonal Problems, and Antisocial-Delinquent). The six scales are highly correlated with these factors, including a range of .78 to .91 for the Aggressive factor, .72 to .83 for Interpersonal Problems, and .68 to .91 for Antisocial-Delinquent. More research is needed to compare these MACI factors with a measure of psychopathic personality traits. However, given previous results indicating the utility of MACI scale scores and a Psychopathy Content Scale of MACI items in discriminating between offenders with and without psychopathic personality traits, these general findings suggest the possibility that factor scores may also assist clinicians in detecting aspects of psychopathy among juvenile offenders.

Mood disorder. Twelve different MACI scales measuring depressive characteristics all correlated with our criterion for mood disorder. These included seven scales from the Personality Patterns domain, two from Expressed Concerns, and three from Clinical Syndromes. These correlations were consistent with existing MACI research on depression. MACI scales most often associated with measures of depression in the literature include Depressive Affect, Doleful, and Suicidal Tendencies scales (Hiatt & Cornell, 1999; Millon, 1993). Millon found that the Depressive Affect scale correlated with the Beck Depression Inventory at a level of .59 in the validity study. Hiatt and Cornell reported correlations of .67 and .77 between MACI scales Doleful Personality and Depressive Affect, and the Child Depression Inventory. I found more modest correlations between MACI scales measuring depressive attributes and the measure of mood disorders (Doleful = .20, Suicidal Tendencies = .29, Depressive Affect = .30). Additional MACI scales with relatively strong correlations with mood disorder diagnosis included Child Abuse (.29), Self-Devaluation (.29), Egotistic (-.29) and Dramatizing (-25).

One reason for these lower correlation coefficients may be that the criterion for mood disorder was based on the independent diagnosis of BSU staff rather than another self-report measure. It is possible that shared method variance may account for some of the relationship between MACI scales and other self-report measures completed by adolescents. The present study's correlations are more comparable to validity studies that utilized third party ratings of depression, rather than another self-report measure. For example, Millon reported correlations between MACI base-rate scores and clinician ratings of which MACI scales best approximated their clients. Select MACI scales were

significantly correlated with this clinical rating of depressive attributes including Inhibited (.27), Doleful (.22), Egotistic (.20), Self-Devaluation (.25), Depressive Affect (.31), and Suicidal Tendency (.24).

In addition to MACI scale correlations, I also analyzed factor correlations with the mood disorder variable. Four factors were found to be correlated ($p<.05$) with mood disorder diagnoses including Attention-seeking (-.24), Self-defeating (.18), Poor Self-concept (.30), and Depressed Mood (.34). The Poor Self-concept factor and Depressed Mood factor were correlated at a higher level than any individual MACI scale. While the differences were small (.30 for Depressive Affect scale vs. .34 for Depressed Mood factor) it suggests some evidence that a grouping of MACI scales may prove to be a better measure of depression than any one scale alone.

I utilized two additional measures of depression to provide concurrent validity for the MACI and depression: history of suicidal ideation/attempt, and history of being prescribed antidepressant medication. Institutions housing juvenile offenders are charged with maintaining the safety of their residents. Prevalence rates of suicide in juvenile facilities were found to have increased four-fold in the years between 1950 and 1990, and was found to be four times greater in detention and correctional facilities then in the general population, (Memory, 1989). I utilized documented history of suicide attempt or suicidal ideation to determine which offenders were at risk for suicide. The Suicidal Tendencies scale correlated with this objective measure of suicide risk at .34. Previous MACI research on suicide attempters suggested that of the 12 Personality Patterns scales, significant differences were found between attempters and non-attempters for Submissive, Forceful, Conforming, and Borderline Tendency (Velting, Rathus, & Miller,

2000). The present study proposed to address the rates of concordance of all MACI scales and MACI factors with a measure of suicide risk, and found that Borderline Tendency (.19), Childhood Abuse (.32), Substance Abuse Proneness (.22), and Suicidal Tendency (.34) were significantly correlated with suicide risk. Postdictive classification results indicated that the Poor Self-Concept factor best differentiated between offenders with and without documented suicide risk (Wilk's Lambda = .966, $p<.03$, overall classification accuracy = .81, sensitivity = .04, specificity = 1.0, kappa = .05).

The individual MACI scale Suicidal Tendency was clearly more related to this measure of suicide risk than any of the seven factors, and predicted group membership at a more effective rate (Wilk's Lambda .89, 79% classification accuracy, sensitivity = .19, specificity = .94, kappa = .16). This postdictive classification provides support for this MACI scale in identifying offenders with a history of suicide risk.

The MACI was moderately correlated with another depression variable, previous or current use of antidepressant medication. This variable was included in the analyses to provide another measure of depressive features among the juvenile offender sample. This variable correlated with three factors, Self-Defeating, Poor Self-Concept, and Depressed Mood. Effect sizes ranged from .04 to .11. A step-wise discriminant function analysis indicated that Factor IV (Poor Self-Concept) best differentiated between offenders with and without a history of being prescribed antidepressant medication (Wilk's lambda = .887, $p<.001$, 72% correctly classified, sensitivity = .32, specificity = .91, and kappa coefficient = .26).

The 12 MACI scales that correlated with Mood Disorder all correlated with the antidepressant variable, along with four additional scales. Correlations with MACI

factors indicated a similar overlap with the diagnosis of Mood Disorder by BSU staff. Correlations between these variables were examined to determine the degree of overlap among the three mood disorder variables. Mood Disorder is significantly correlated with both Antidepressant (r= .43) and Suicidal Ideation (r = .23). Even though these measures are not distinct and separate from one another, the overall correspondence with these different measures of depression provides further evidence for the MACI to measure depressive symptomatology among this population.

Substance abuse disorder. In contrast with Conduct disorder, the analyses for Substance Abuse Disorder were notable in that the variable was correlated significantly with 21 of 27 MACI clinical scales and six of seven MACI factors. Eighteen of the twenty-one significant correlations were significant at $p<.01$ with a range between .23 and .47. These results supported previous MACI research with substance abuse.

Grilo, Fehon, Walker, and Martino, (1996) reported that adolescent inpatients with substance use disorder diagnoses (SUD) differed from non-SUD inpatients on four MACI Clinical Syndromes scales: Substance Abuse Proneness, Delinquent Predisposition, Impulsive Propensity, and Anxious Feelings. The present study's factor analysis indicates that these same scales all load significantly on to the Antisocial-Delinquent factor (factor loadings range from .84 to -.92). This factor correctly classified 72% of juvenile offenders into the correct substance abuse group (sensitivity = 63%, specificity = 79%). This finding supports existing research and provides preliminary support for this MACI factor as a potentially useful screen for substance abuse disorders among juvenile offenders.

One factor that may contribute to the high rate of correlations between substance abuse and most MACI scales is that substance abuse has been found to be highly correlated with a variety of comorbid psychological symptoms. For example, a diagnosis of conduct disorder is more likely to occur with juvenile delinquents with substance abuse problems than those without substance abuse problems (Hovens, Cantwell, & Kiriakos, 1994; Neighbors, Kempton, and Forehand 1992). Accordingly, we found that substance abuse problems correlated with factors measuring different aspects of conduct problems, including aggressive personality traits (Aggressive = .28), social conflict (Interpersonal Problems = .36) and delinquent behavior (Antisocial Delinquent = .39). Research has also indicated that substance abuse disorders are often comorbid with depression (Lexcen & Redding, 2000; Milin, Halikas, Meller, and Morse, 1991). Our results reflect these rates as well, as indicated by positive correlations between substance abuse problems and two factors measuring depressive traits (Depressed Mood = .20, Self-Defeating = .29).

Another possible reason for the high number of correlations between the Substance Abuse Disorder variable and most MACI scales is that it is the only outcome criterion that is based on youth self-report. Because our dependent variables, scores on the MACI clinical scales, are also self-report measures, the strength of correlations may be partly due to shared method variance.

Future Research

The present study provides support for the MACI's utility as a screening tool for institutions housing juvenile offenders. Results suggest that MACI scales and factors are able to measure characteristics of juvenile offenders and differentiate between different

groups of offenders. To maximize the MACI's appeal to juvenile institutions, it would be important to show its ability to detect positive cases and identify offenders most likely to have a particular mental health problem or to commit a violent act while incarcerated. Thus, sensitivity rates must be maximized to be most useful for clinicians. The present study found preliminary support for increasing sensitivity for detecting violent offenders by manipulating cutoff scores based on Millon's base-rate cutoffs of 65, 75, and 85. Additional analysis may yield improved classification rates than the present study where sensitivity rates as determined by SPSS 10.0 ranged from .05 to .64. Further research of optimal MACI cutoffs may enhance this measure's efficacy in the eyes of juvenile institutions.

The present study addressed the MACI's utility in the assessment of juvenile offenders. The link from assessment and identification to treatment of juvenile offenders is a difficult task facing all institutions. In the development of the MACI, Millon (1993) cited its utility as a treatment planning tool to clinicians in a variety of clinical settings. At this time, there has been little research to support its use in this regard with a juvenile offender population. Future research is needed to explore the MACI's utility in aiding clinical decisions regarding treatment. It is possible that the MACI is well suited to aid in the selection of offenders for group psychotherapy based on personality characteristics as well as mental health symptoms. MACI data may also provide information regarding receptivity and amenability to treatment. For example, there is some evidence from MAPI research that the Forceful scale did not fluctuate following a course of treatment in a psychiatric facility. Is a high Forceful base rate score a contra-indication for individual therapy? Would high scores on Conforming and Self-Demeaning scales indicate

receptivity to group therapy? Future research might address the utility of the MACI in informing treatment.

Additional mental health variables that were beyond the scope of the present study should be considered in future MACI research with juvenile offenders. For example, Post Traumatic Stress Disorder among juvenile offenders has been estimated to be between 24% - 32% (Burton, Foy, Bwanausi, Johnson, & Moore, 1994; Steiner, Garcia, & Matthews, 1997). Identifying offenders with trauma histories could be difficult given that aggressive, anxious, hyper-vigilant symptoms consistent with PTSD could be seen as somewhat adaptive or typical of incarcerated adolescents. It appears as if a screening device sensitive to PTSD would be of use to clinicians and of great benefit to offenders with trauma histories. Future research might explain the MACI's usefulness in measuring PTSD within this population.

Another important mental health problem to be considered by clinicians in juvenile facilities is schizophrenia. According to DSM-IV, the typical age range for the onset of schizophrenia begins in the late teens. Determining if the MACI can detect early signs and symptoms of thought disordered offenders would further its utility among clinicians working with this population.

Study Limitations

The MACI is a self-report inventory and thus has the same limitations as other self-report instruments, including vulnerability to respondent bias or defensiveness in acknowledging undesirable characteristics. It is notable that mean base-rates scores for Desirability were among the highest scores in the sample ($x = 67.4$). Although the MACI adjusts the base rate scores of some clinical scales for respondents with high or low

Disclosure scales, the general trend of higher scores suggests that overall, offenders were motivated to present as socially desirable and emotionally stable. This may result in MACI scores under-reporting the trait being measured.

This study may be somewhat limited by issues related to generalizeability to other juvenile offender populations. In this study, the MACI was administered to juvenile offenders by researchers who were clearly identified as students from the University of Virginia and were not affiliated with the Reception and Diagnostic Center or the Department of Juvenile Justice. Respondents were assured of confidentiality and that MACI responses would not be shared with Behavioral Services Unit staff, so that test results would not affect their incarceration. The terms of confidentiality consistent with this research project could have had the effect of increasing disclosure and decreasing inhibition in responding. Thus, although the present sample suggests some inclination to present as desirable and well-adjusted, this inclination might be even greater in routine clinical administration of the MACI by BSU staff.

This study was also limited by some weaknesses in outcome measures. Mood Disorder and Conduct Disorder were based upon the diagnostic impressions of Behavioral Services Unit staff members. While these staff members are very skilled and experienced in working with juvenile offenders, and diagnoses were determined after a comprehensive evaluation, there was no means of measuring the reliability or validity of the staff diagnoses. Many studies utilize a structured clinical interview such as the Diagnostic Interview Schedule for Children (DISC), a measure with established reliability and validity in determining psychological diagnoses. Such a procedure might be used in future MACI studies

The variable for substance abuse was derived from the SASSI, a self-report measure the RDC administers to all offenders. The SASSI has been found to have a high detection rate for adolescents who admit to substance use and a much lower rate for classifying non-users or non-admitters (Rogers et al., 1997). Rogers et al., reported that the SASSI was effective in documenting drug and alcohol abuse among offenders who acknowledged such use. However, they found the SASSI to be less effective in identifying unreported substance abuse. The authors found that nearly two-thirds of non-users were mistakenly classified as chemically dependent. This deficiency may have contributed to the significant correlations between most MACI scales and this measure of substance abuse. However, these deficits in identifying substance abusing adolescents who lie about their use is one that is common to most substance abuse measures and is not unique to this study.

The present study utilized record reviews for two violence variables, violence while incarcerated and severity of violent offense. These variables may under-represent the true occurrence of violent offenses because record reviews only represent the offenses for which offenders were caught and prosecuted. This flaw may also affect the chronic offending variable, which takes into account the number and severity of prior offenses by history. As reported by Murrie, (2001), a good deal of institutional aggression was reported to interviewers that went undetected by staff. These limitations likely led to an overall under-count of violence in study measures.

Clinical Implications

The prevalence of mental health problems among juvenile offenders poses a major problem for juvenile institutions. Identifying those offenders with mental health

problems or who pose a threat to peers and/or institutional staff members has become a priority as these prevalence rates increase. The Millon Adolescent Clinical Inventory was designed to be used with clinical populations and is often used in correctional settings. However, there is little research into the validity of this measure with juvenile offenders. The present study provides solid evidence that supports the validity of the MACI in identifying violent offenders, chronic offenders, and offenders with mood and substance abuse disorders.

Results of this study demonstrate support for a new factor structure of the MACI. Factor analyses by Millon's grouping of MACI clinical scales yielded three (Personality Patterns), two (Expressed Concerns), and two (Clinical Syndromes) factor solutions. These factors accounted for a high percentage of the total variance in each analysis, and formed theoretically meaningful groupings of MACI scales. These factors showed good correspondence with theoretically related outcome criteria. Results also supported the predictive validity of some factor scores in assessing violent behavior while incarcerated.

The present results suggest that the MACI holds promise for clinicians working with juvenile offender populations. While no instrument should be used as the sole source of information in the diagnosis of mental disorders, the MACI would be an effective supplement for clinicians as they formulate diagnostic impressions and develop treatment plans for offenders with a wide range of psychopathology. Other possible uses exist as well. Data from the MACI's Personality Patterns scales and factors may provide useful information that clinicians could share with unit staff who interact with difficult offenders on a day-to-day basis. Retzlaff, Stoner, and Kleinsasser (2002) reported that with adult offenders, the MCMI-II is used to identify prominent personality types for corrections

staff for the purpose of aiding communication and facilitating understanding of inmates. An offender with a high score on the Schizoid scale, for example, might be identified to staff as one whose personality style is likely introverted, shows little emotion, acts as a loner, and who will likely comply with directions if given simple requests, one at a time. These traits could be framed as pare part of the inmate's personality style, rather than an indication of a problem (Retzlaff, Stoner, and Kleinsasser, 2002).

Many studies have explored the utility of a variety of personality inventories with juvenile offender populations. Studies have demonstrated support for the MMPI-A in classifying offenders based on offense characteristics (Glaser, Calhoun, & Petrocelli, 2002). Other studies have shown support for the validity of a particular instrument in measuring a particular outcome criteria such as PTSD (Cashel, 2000), institutional aggression (Marsh, 2002), or sex offending (Losada-Paisey, 1997). Perhaps the most comparable studies to the present study involve the MAYSI, which was developed as a screening instrument for juvenile offenders. One report (Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001) supported the MAYSI's validity with juvenile offenders by indicating that select MAYSI scales had significant correlations with select scales on other personality inventories, including the MACI. However, the results did not include external criteria such as clinician diagnoses or institutional records. Another study reported that the MAYSI was able to classify offenders into groups by severity of mental health problems, which was determined by history of mental health services.

The present study shows support for the clinical use of the MACI as a screening instrument in a juvenile offender population. Results support the predictive validity of the MACI with respect to violent behavior while incarcerated. MACI results were

demonstrated to be good indicators of important features of juvenile offenders such as chronic offending, mood disorder, and substance abuse problems. Further research is warranted to support these findings, to explore the MACI's ability to measure additional areas of psychopathology inherent in this population, and to investigate the utility of this measure in informing the treatment of juvenile offenders with mental health problems.

References

Abram, K.M., Teplin, L.A., McClelland, G.M., & Dulcan, M.K. (2003). Comorbid psychiatric disorders in juvenile detention. *Archives of General Psychiatry, 60,* 1097-1108.

Alessi, N.E.,McManus, M., Grapentine, W.L., & Brickman, A. (1984). The characterization of depressive disorders in serious juvenile offenders. *Journal of Affective Disorders, 6,* 9-17.

Allen-Hagen, B. (1993). *Conditions of confinement in juvenile detention and correctional facilities.* Washington, C.C.: National Criminal Justice Reference Service.

Atkins, D.L., Pumariega, A.J., Rogers, K., Montgomery, L., Nyobro, C., Jeffers, G., & Sease, F. (1999). Mental health and incarcerated youth I: Prevalence and nature of psychopathology. *Journal of Child and Family Studies, 8,* 193-204.

Borduin, C.M., Henggeler, S.W., Blaske, D.M., & Stein, R.J. (1990). Multisystemic treatment of adolescent sexual offenders. *International Journal of Offender Therapy and Comparative Criminilogy, 34,* 105-114.

Brandenberg, N., Freedman, R., & Silver, S. (1990). The epidemiology of childhood psychiatric disorders: Prevalence findings from recent studies. *Journal of the American Academy of Child and Adolescent Psychiatry, 29,* 76-83.

Brezina, T. (1998). Adolescent maltreatment and delinquency: The question of intervening processes. *Journal of Research in Crime and Delinquency, 35,* 71-99.

Burton, D., Foy, D., Bwanausi, C., Johnson, J., & Moore, L. (1994). The relationship between traumatic exposure, family dysfunction, and post-traumatic stress symptoms in male juvenile offenders. *Journal of Traumatic Stress, 7* , 83-93.

Butcher, J.N., Braswell, L., & Raney, D. (1983). A cross-cultural comparison of American Indian, black, and white inpatients on the MMPI and presenting symptoms. *Journal of Consulting and Clinical Psychology, 51*, 587-594.

Butcher, J.N., Williams, C.L., Graham, J.R., Archer, R.P., Tellegen, A., Ben-Porath, Y.S., & Kaemmer, B. (1992). MMPI-A (Minnesota Multiphasic Personality Inventory – Adolescent). Minneapolis: University of Minnesota Press.

Caggiano, A.D. (2001). Identifying violent-toward-staff juvenile delinquents via the Millon Adolescent Clinical inventory and neuropsychological measures. *Journal of Offender Rehabilitation, 32*, 147-165.

Cashel, M.L., Ovaert, L., & Holliman, N.G. (2000). Evaluating PTSD in incarcerated male juveniles with the MMPI-A: An exploratory analysis. *Journal of Clinical Psychology, 56* , 1535-1549.

Cellini, H.R. (2000). Mental health concerns of adjudicated adolescents. *Juvenile Justice Update, 6*, 1-14.

Chiles, J., Miller, M., & Cox, C. (1979). Depression in an adolescent delinquent population. *Archives of General Psychiatry, 37*, 1179-1184.

Choca, J.P., Shanley, L.A., Peterson, C.A., Van Denburg, E (1990). Racial Bias and the MCMI. Journal of Personality Assessment, *54*, 479-490.

Cocozza, J.J., & Skowyra, K.R. (2000). Youth with mental health disorders: Issues and emerging responses. *Juvenile Justice Journal, 7*, 3-13.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, H.L., Parmalee, D.X., Irwin, L., Weisz, J.R., Howard, P., Purcell, P., & Best,

A.M. (1990). Characteristics of children and adolescents in a psychiatric hospital and a corrections facility. *Journal of the American Academy of Child and Adolescent Psychiatry*, *131*, 909-913.

Cornell, D.G., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive offenders. *Journal of Consulting and Clinical Psychology*, *64*, 783-790.

Costello, J.C., Jameson, E.J. (1987). Legal and ethical duties of health care professionals to incarcerated children. *The Journal of Legal Medicine*, *8*, 191-220.

Costello, R.M., Tiffany, D.W., & Gier, RH. (1972). Methodology issues and racial (black-white) comparisons on the MMPI. Journal of Consulting and Clinical Psychology, *38*, 161-168.

Cottle, C., Lee, R., & Heilbrun, K. (2001). The prediction of criminal recidivism in juveniles: A meta analysis. *Criminal Justice & Behavior*, *28*, 367-394.

Cottler, L., Robins, L., & Helzer, J. (1989). The reliability of the SAM. *British Journal of the Addictions*, *84*, 801-814.

Dana, R. H. (1993). Multicultural assessment perspectives for professional psychology. Boston: Allyn & Bacon. Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (1994). American Psychological Association: Washington, D.C.

DiCataldo, F., Greer, A., & Profit, W. (1995). Screening prison inmates for mental disorder: An examination of the relationship between mental disorder and prison adjustment. *Bulletin of American Academy of Psychiatry and Law*, 23, 573-585.

Dozois, D.J., & Kelln, B.R. (1999). Factor Analysis of the MCIM-III on an Offender Population, *Journal of Offender Rehabilitation*, *29*, 77-87.

Eppright, TD., Kashani, J.H., Robinson, B.D., & Reid, J.C. (1993). Comorbidity of Conduct Disorder and Personality Disorders in an Incarcerated Juvenile Population. *American Journal of Psychiatry, 150* , 1233-1236.

Friedman, R.M., & Simmons, D. (in press). Prevalence of social, emotional, and mental disorders in the juvenile justice population. In J.J. Cocozza K. Skowyra (Eds.), *The mental health needs of juvenile offenders: A comprehensive review.* Delmar, NY: Policy Research Associates.

Giaconia R, Reinherz H, Silverman A, Bilge P, Frost A, Cohen E (1995). Traumas and posttraumatic stress disorder in a community population of older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1369-1380.

Glaser, G.A., Calhoun, G.B., & Petrocelli, J.V. (2002). Personality characteristics of male juvenile offenders by adjudicated offenses as indicated by the MMPI-A. *Criminal Justiceand Behavior, 29*, 183-201.

Gorman-Smith, D., Tolan, P.H., Zelli, A., Huesmann, L.R. (1996). The Relation of Family Functioning to Violence Among Inner-City Minority Youths. *The Journal of Family Psychology, 10*, 115-129.

Grilo, C.M., Fehon, D.C., Walker, M., & Martino, S. (1996). A comparison of Adolescent inpatients with and without substance Abuse Using the Millon Adolescent Clinical Inventory. *Journal of Youth and Adolescence, 25* , 379-388.

Grisso, T. (2000). Massachusetts Youth Screening Instrument – Second Version (MAYSI-2): Users manual and technical report. Worcester, MA: University of

Massachusetts Medical School.

Grisso, T., Barnum, R., Fletcher, K.E., Cauffman, E., Peuschold, D. (2001). Massachusetts Youth Screening Instrument for the mental health needs of juvenile justice youths. The Journal of the American Academy of Child & Adolescent Psychiatry, *40*, 541-548.

Hare, R.D. (1996). Psychopathy: a clinical construct whose time has come. *Criminal Justice and Behavior*, *23*,25-54.

Harkavy- Friedman, J.M., & Asnus, G.M. (1989). Assessment of suicidal behavior: A new insrument. *Psychiatric Annals*, *19*, 382-387.

Harpur, T.J., Hare, R.D., & Hakistan, H.A. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, *1*, 6-17.

Hiatt, M.D., & Cornell, D.G. (1999). Concurrent validity of the Millon Adolescent Clinical Inventory as a measure of depression in hospitalized adolescents. *Journal of Personality Assessment*, *73*, 64-79.

Hooper, F.A., & Evans, R.G. (1984). Screening for disruptive behavior of institutionalized juvenile offenders. *Journal of Personality Assessment*, *48*, 159-161.

Hovens, J.G., Cantwell, D.P., & Kiriakos, R. (1994). Psychiatric comorbidity in hospitalized adolescent substance abusers. *The American Academy of Child and Adolescent Psychiatry*, *33*, 476-483.

Jesness, C.J. (1988). The Jesness Inventory classification system. *Criminal Justice and Behavior*, *15*, 78-91.

Jones, P.R., Harris, P.W., Fader, J., Grubstein, L. (2001). Identifying chronic juvenile offenders. *Justice Quarterly*, *18*, 479-507.

Kavoussi, R.J., Kaplan, M., & Becker, J.V. (1988). Psychiatric diagnosis in adolescent sex offenders. Journal of the American Academy of Child and Adolescent Psychiatry, *27*, 241-243.

Kempton, T., & Forehand, R. (1992). Suicide attempts among juvenile delinquents: The contribution of mental health factors. *Behavior Research and Therapy*, *30*, 537-541.

Lexcen, F. & Redding, R. E. (2000). Mental Health needs of Juvenile Offenders. *Juvenile Justice Fact Sheet*. Charlottesville, VA: Institute of Law, Psychiatry, & Public Policy, University of Virginia.

Loeber, L (1990). Development and risk factors of juvenile antisocial behavior and delinquency. *Clinical Psychology Review*, *10*, 1-41.

Loper, A.B., Hoffschmidt, S.J., & Ash, E. (2001). Personality features and characteristics of violent events committed by juvenile offenders. *Behavioral Sciences and the Law*, *19*, 81-96.

Losada-Paisey, G. (1998). Use of the MMPI-A to assess personality of juvenile male delinquents who are sex offenders and nonsex offenders. *Psychological Reports*, *83*, 115-122.

Marsh, T.Y. (2002). Prediction of institutional misbehavior among juvenile offenders with the Personality Inventory for Youth. Unpublished doctoral dissertation. University of Virginia.

Martin, R.D. (1981). Cross-validation of the Jesness Inventory with delinquents and

nondelinquents. *Journal of Consulting and Clinical Psychology, 49*, 10-14.

McCann, J.T. (1997). *The MACI: Composition and Clinical Applications.* In Ed, Millon, T. (Ed,), *The Millon Inventories* (pp.135-174). New York, NY, The Guilford Press.

McCann, J.T. (1999). *Assessing Adolescents with the MACI: Using the Millon Adolescent Clinical Inventory.* New York: John Wiley & Sons, Inc.

McGarvey, E. L., & Waite, D. (1999). *Profiles of incarcerated adolescents in correctional facilities: Fiscal years 1993-1998.* Richmond, VA: Department of Criminal Justice Services.

McGarvey, E. L., & Waite, D. (2000). Mental health needs among adolescents committed to the Virginia Department of Juvenile Justice. *Juvenile Justice Fact Sheet.* Charlottesville, VA: Institute of Law, Psychiatry, & Public Policy, University of Virginia.

McManus, M., Alessi, N.E., Grapentine, W.L., & Brickman, A. (1984). Psychiatric disturbance in serious delinquents. *Journal of the American Academy of Child Psychiatry, 23*, 602-615.

Memory, J. (1989). Juvenile suicides in secure detention facilities: Correction of published rates. *Death Studies, 13*, 455-463.

Metzner, J.L., Miller, R.D., Kleinsasser, D. (1994). Mental health screening and Evaluation within prisons. The Bulletin of the American Academy of Psychiatry and the Law, *22*, 51-457.

Meyers, K. (1991). Comprehensive Addiction Severity Index-Adolescents. Unpublished manuscript.

Milin, R., Halikas, J.Ad., Meller, J.E., Morse, C. (1991). Psychopathology among substance abusing juvenile offenders. Journal of the American Academy of Child and Adolescent Psychiatry, *30*, 569-574.

Millon, T., Millon, C., & Davis, R. (1993). *Millon adolescent clinical inventory manual.* Minneapolis, MN: National Computer Systems.

Munley, P.H., Vacha-Haase, T., Busby, R.M., Paul, B.D. (1998). The MCMI-II and Race. *Journal of Personality Assessment*, *70*, 183-189.

Murrie, D.C. (2002). Psychopathy among incarcerated adolescents: Screening measures and violence prediction. Unpublished doctoral dissertation. University of Virginia.

Murrie, D.C., & Cornell, D.G. (2000). The Millon Adolescent Clinical Inventory and Psychopathy. *Journal of Personality Assessment*, *75*, 110-125.

Nagayama Hall, G.C, Bansal, A., & Lopez, I.R. (1999). Ethnicity and Psychopathology: A Meta-Analytic Review of 31 Years of MMPI/MMPI-2 Research. *Psychological Assessment*, *11*, 186-197.

Neighbors, B., Kempton, T., & Forehand, R. (1992). Co-occurrence of substance abuse with conduct, anxiety, and depression disorders. *Addictive Behaviors.*

Office of Juvenile Justice Delinquency Prevention (1999). *Juveniles in correctional facilities. Juvenile offenders and victims: 1999 National Report.*

Otto, R.K., Greenstein, J.J., Johnson, M.K., & Friedman, R. (1992). Prevalence of mental disorders among youth in the juvenile justice system. In Cocozza, J.J. (Ed.) *Responding to the Mental Health needs of Youth in the Juvenile Justice System.*

Seattle, WA: The National Coalition for the Mentally Ill in the Criminal Justice System, pp. 7-48.

Pena, L.M., Megargee, I.E., & Brody, E. (1996). MMPI-A patterns of male juvenile delinquents. *Psychological Assessment*, *8*, 388-397.

Repucci, D.N., Redding, R.E. (2000). Screening instruments for mental illness in juvenile offenders. *Correctional Mental Health Report*, *2*, 52-53.

Retzlaff, P.D., & Gibertinia, M. (1987). Factor Structure of the MCMI Basic Personality Scales and Common Item-artifact. *Journal of Personality Assessment*, *51*, 588-594.

Retzlaff, P., Stoner, J., Kleinsasser, D. (2002). The Use of the MCMI-III in the Screenng and Triage of Offenders. *International Journal of Offender Therapy and Comparative Criminology*, *46*, 319-332.

Rhode, P., Mace, D. E., & Seeley, J. R. (1997). The association of psychiatric disorders with suicide attempts in a juvenile delinquent sample. *Criminal Behavior and Mental Health*, *7*, 187-200.

Rhode, P., Seeley, J. R., & Mace, D. E. (1997). Correlates of suicidal behavior in a juvenile detention population. *Suicide and Life-Threatening Behavior*, *27*, 164-175.

Rogers, R., Cashel, M.L., Johansen, J., Sewell, K.W., Gonzales, C. (1997). Evaluation of Adolescent Offenders with Substance Abuse. *Criminal Justice and Behavior*, *24*, 114-128.

Romm, S., Bockian, N., & Harvey, M. (1999). Factor-based prototypes of the Millon Adolescent Clinical Inventory in adolescents referred for residential treatment.

Journal of Personality Assessment, 72, 125-143.

Rosenthal, R. (1990). How are we doing in soft psychology? *American Psychologist, 45*, 775-777.

Secret, P.E., & Johnson, J.B.(1997). The effect of race on juvenile justice decision making in Nebraska: Detention, adjudication and disposition. *Justice Quarterly, 14*, 445-478.

Salekin, R. T. (2002). Factor-Analysis of the Millon Adolescent Clinical Inventory in a Juvenile Offender Population: Implications for Treatment. *Journal of Offender Rehabilitation, 34*, 15-29.

Salekin, R.T., Larrea, M.A., Ziegler, T. (2002). Relationships Between the MACI and the BASC in the Assessment of Child and Adolescent Offenders. *Journal of Forensic Psychology Practice, 2*, 35-50.

Sorensen, E, & Johnson, E. (1996). Subtypes of incarcerated delinquents via cluster analysis. *Journal of Child Psychology and Psychiatry, 37*, 293-303.

Stafford, E. (1997). Psychopathy as a predictor of adolescents at risk for inpatient violence. Unpublished Dissertation. University of Virginia.

Steiner, H., Garcia, I.G., & Matthews, Z. (1997). Posttraumatic stress disorder in incarcerated Juvenile delinquents. Journal of the American Academy of Child and Adolescent *Psychiatry, 36*, 357-365.

Stewart, D.G., Trupin, E.W. (2003). Clinical Utility and Policy Implications of a Statewide Mental Health Screening Process for Juvenile Offenders. *Psychiatric Services, 54*, 377-382.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using Multivariate Statistics.* Boston, Allyn &

Bacon, Publishers.

Teplin, L. (2001). Assessing alcohol, drug, and mental disorders in juvenile detainees. *Office of Juvenile Justice and Delinquency Prevention Fact Sheet*, January, 2001. OJJDP: Washington DC.

Thompson, L.L., Riggs, P.D., Mikulich, S.K., Crowley, T.J. (1996). Contribution of ADHD Symptoms to Substance Problems and Delinquency in Conduct-Disordered Adolescents. *Journal of Abnormal Child Psychology, 24*, 325-347.

Timmons-Mitchell, J., Brown, C., Schulz, C., Wester, S.E., Underwood, L.A., Semple, W.E. (1997). Comparing the mental health needs of female and male incarcerated juvenile delinquents. *Behavioral Sciences and the Law, 15*, 195-202.

Ulzen, T., & Hamilton, H. (1998). The nature and characteristics of psychiatric comorbidity in incarcerated adolescents. *Canadian Journal of Psychiatry, 43*, 57-63.

Velting, D.M., Rathus, J.H., Miller, A.L. (2000). MACI Personality Scale Profiles of Depressed Adolescent Suicide Attempters: A Pilot Study. *Journal of Clinical Psychology, 56*, 1381-1385.

Vitacco, M.J., Neumann, C.S., Robertson, A.A., Durrant, S.L., (2002). Contributions of Impulsivity and Callousness in the Assessment of Adjudicated Male Adolescents: A Prospective Study. *Journal of Personality Assessment, 78*, 87-103.

Wierson, M., Forehand,R. L., & Frame, C. L. (1992). Epidemiology and Treatment of Mental Health Problems in Juvenile Delinquents. *Advanced Behavior Research Therapy, 14*, 93-120.

Witt, P.H., Bosley, J.T., Hiscox, S.P. (2002). Evaluation of juvenile sex offenders. *The*

Journal of Psychiatry and the Law, 30, 569-592.

Wordes, M., Bynum, T.S., & Corley, C.J. (1994). Locking up Youth: The Impact of Race on Detention Decisions. *Journal of Research in Crime and Delinquency, 21*, 149-165.

Worling, J.R. (2001). Personality-based typology of adolescent male sexual offenders: Differences in recidivism rates, victim-selection characteristics, and personal victimization histories. *Sexual Abuse: A Journal of Research and Treatment, 13*, 149-166.

Yudofsky, S.C., Silver, J.M., Jackson, W., Endicott, J., & Williams, D (1986). The Overt Aggression Scale for the Objective Rating of Verbal and Physical Aggression. *The American Journal of Psychiatry, 143*, 35-39.

Appendix 1. Description of MACI Scales

Scale	Name	Number of Items	Internal Consistency Coefficient (alpha)
Personality Patterns			
1	Introversive	44	.83
2A	Inhibited	37	.86
2B	Doleful	24	.86
3	Submissive	48	.74
4	Dramatizing	41	.82
5	Egotistic	39	.80
6A	Unruly	39	.84
6B	Forceful	22	.83
7	Conforming	39	.86
8A	Oppositional	43	.85
8B	Self-Demeaning	44	.90
9	Borderline Tendency	21	.86
Expressed Concerns			
A	Identity Diffusion	32	.79
B	Self-Devaluation	38	.91
C	Body Disapproval	17	.85
D	Sexual Discomfort	37	.73
E	Peer Insecurity	19	.75
F	Social Insensitivity	39	.79
G	Family Discord	28	.79
H	Childhood Abuse	24	.83
Clinical Syndromes			
AA	Eating Dysfunctions	20	.86
BB	Substance-Abuse Proneness	35	.89
CC	Delinquent Predisposition	34	.77
DD	Impulsive Propensity	24	.79
EE	Anxious Feelings	42	.75
FF	Depressive Affect	33	.89
GG	Suicidal Tendency	25	.81
Modifying Indices			
X	Disclosure	A	--
Y	Desirability	17	.73
Z	Debasement	16	.87
VV	Reliability	2	--

Note. Internal Consistency statistics represent data from Developmental Sample A (N=579).
(Millon, Millon, & Davis, 1993)

Appendix 2. MACI Personality Patterns and relevant DSM-IV terms

	Personality Patterns	DSM-IV Terms
1.	Introversive	Schizoid-Like
2A.	Inhibited	Avoidant
2B.	Doleful	Depressive
3.	Submissive	Dependent
4.	Dramatizing	Histrionic
5.	Egotistic	Narcissistic
6A.	Unruly	Antisocial
6B.	Forceful	Sadistic
7.	Conforming	Obsessive Compulsive
8A.	Oppositional	Negativistic, Passive Aggressive
8B.	Self-Demeaning	Self-Defeating
9.	Borderline Tendency	Borderline, Paranoid, Schizotypal

Appendix 3. Correlations Among MACI Scale Scores

MACI Scale	1	2A	2B	3	4	5	6A	6B	7	8A	8B	9	A	B	C
1	1.0	.565**	.275**	.072	-.720**	-.566**	-.278**	-.069	-.206*	.251**	.275**	.184*	.445**	.465**	.310**
2A	.565**	1	.329**	.245**	-.609**	-.585**	-.330**	-.222**	-.069	.113	.474**	.175*	.152	.535**	.347**
2B	.275**	.329**	1	-.262**	-.364**	-.479**	.283**	.271**	-.529**	.661**	.726**	.630**	.606**	.706**	.224**
3	.072	.245**	-.262**	1	.085	.088	-.726**	-.814**	.778**	-.573**	-.231**	-.472**	-.589**	-.220*	.015
4	-.720**	-.609**	-.364**	.085	1	.843**	.178*	-.082	.434**	-.394**	-.380**	-.293**	-.468**	-.618**	-.449**
5	-.566**	-.585**	-.479**	.088	.843**	1	.105	-.072	.487**	-.447**	-.583**	-.468**	-.531**	-.757**	-.545**
6A	-.278**	-.330**	.283**	-.726**	.178*	.105	1	.746**	-.624**	.564**	.234**	.520**	.409**	.142	-.021
6B	.069	-.222**	.271**	-.814**	-.082	-.072	.746**	1	-.745**	.624**	.268**	.567**	.535**	.262**	.090
7	-.206**	-.069	-.529**	.778**	.434**	.487**	-.624**	-.745**	1	-.777**	-.526**	-.724**	-.756**	-.597**	-.272**
8A	.251**	.113	.661**	-.573**	-.394**	-.447**	.564**	.624**	-.777**	1	.614**	.709**	.680**	.587**	.236**
8B	.275**	.474**	.726**	-.231**	-.380**	-.583**	.234**	.268**	-.526**	.614**	1	.686**	.577**	.812**	.456**
9	.184*	.175*	.630**	-.472**	-.293**	-.468**	.520**	.567**	-.724**	.709**	.686**	1	.716**	.640**	.202*
A	.445**	.152	.606**	-.589**	-.468**	-.531**	.409**	.535**	-.756**	.680**	.577**	.716**	1	.673**	.221**
B	.465**	.535**	.706**	-.220*	-.618**	-.757**	.142	.262**	-.597**	.587**	.812**	.640**	.673**	1	.590**
C	.310**	.347**	.224**	.015	-.449	-.545**	-.021	.090	-.272**	.236**	.456**	.202*	.221**	.590**	1
D	.112	.237**	-.458**	.670**	.115	.183*	-.731**	-.656**	.686**	-.604**	-.397**	-.509**	-.549**	-.331**	-.104

E	.531**	.655**	.131	.073	-.609**	-.410**	-.334**	-.152	-.087	.069	.197*	-.013	.157	.383**	.195*
F	-.314**	-.568**	-.028	-.666**	.259**	.410**	.596**	.673**	-.372**	.301**	-.240**	.056	.186*	-.236**	-.282**
G	-.286**	-.260**	.288**	-.687**	.171*	-.006	.719**	.630**	-.635**	.477**	.361**	.505**	.440**	.298**	.070
H	.243**	.269**	.602**	-.395**	-.362**	-.447**	.216*	.275**	-.576**	.558**	.661**	.612**	.587**	.640**	.209*
AA	.277**	.308**	.198*	.067	-.397**	-.449**	-.052	.020	-.215*	.170*	.351**	.144	.182*	.515**	.887**
BB	-.130	-.068	.539**	-.721**	-.147	-.240**	.735**	.685**	-.760**	.689**	.493**	.655**	.610**	.419**	.096
CC	-.299**	-.515**	.125	-.710**	.250**	.247**	.841**	.701**	-.495**	.473**	-.017	.315**	.290**	-.141	-.263**
DD	.134	-.194*	.431**	-.707**	-.060	-.164	.817**	.737**	-.798**	.688**	.419**	.720**	.523**	.382**	.113
EE	-.237**	.313**	-.255**	.761**	-.093	-.053	-.844**	-.703**	.595**	-.546**	-.203*	-.424**	-.372**	-.048	.028
FF	-.419**	.544**	.715**	-.238**	-.633**	-.702**	.100	.269**	-.599**	.553**	.763**	.637**	.651**	.873**	.457**
GG	.312**	.291**	.655**	-.452**	-.440**	-.536**	.244**	.378**	-.621**	.645**	.719**	.704**	.696**	.698**	.311**
X	.303**	.229**	.714**	-.654**	-.501**	-.541**	.474**	.629**	-.842**	.785**	.681**	.698**	.807**	.789**	.324**
Y	-.278**	-.185*	-.082	.416**	.442**	.520**	-.237**	-.417**	.568**	-.352**	-.237**	-.370**	-.374**	-.270**	-.260**
Z	.436**	.418**	.743**	-.308**	-.540**	-.671**	.235**	.336**	-.657**	.622**	.770**	.726**	.709**	.852**	.422**

Scale	D	E	F	G	H	AA	BB	CC	DD	EE	FF	GG	X	Y	Z
1	.112	.531**	-.314**	-.286**	.243**	.277**	-.130	-.299**	-.134	.237**	.419*	.312**	.303**	-.278**	.436**
2A	.237**	.655**	-.568**	-.260**	.296**	.308**	-.068	-.515**	-.194*	.313**	.544**	.291**	.229**	-.185*	.418**
2B	-.458	.131	-.028	.288**	.602**	.198*	.569**	.125	.431**	-.255**	.715**	.655**	.714**	-.082	.743**
3	.670**	.073	-.666**	-.687**	-.395**	.067	-.721**	-.710**	-.707**	.761**	-.238**	-.452**	-.654**	.416**	-.308**
4	.115	-.609**	.259**	.171*	-.362**	-.397**	-.147	.250**	-.060**	-.093	-.633**	-.440**	-.501**	.442**	-.540**
5	.183*	-.410**	.410**	-.006	-.447**	-.449**	-.240**	.247**	-.164	-.053	-.702**	-.536**	-.541**	.520**	-.671**
6A	-.731**	-.334**	.596**	.719**	.216*	-.052	.735**	.841**	.817**	-.844**	.100	.244**	.474**	-.237**	.235**
6B	-.656**	-.152	.673**	.630**	.275**	.020	.685**	.701**	.737**	-.703**	.269**	.378**	.649**	-.417**	.336**
7	.686**	-.087	-.372**	-.635**	-.576**	-.215*	-.760**	-.496**	-.798**	.595**	-.599**	-.621**	-.842**	.568**	-.657**
8A	-.604**	.069	.301**	.477**	.558**	.170*	.689**	.473**	.688**	-.546**	.553**	.645**	.785**	-.352**	.622**
8B	-.397**	.197*	.240**	.361**	.661**	.351**	.493**	-.017	.419**	-.203*	.763**	.719**	.681**	-.267**	.770**
9	-.509**	-.013	.056	.505**	.612**	.144	.655**	.315**	.720**	-.424**	.637**	.704**	.698**	-.370**	.726**
A	-.549	.157	.186*	.440**	.587**	.182*	.610**	.290**	.523**	-.372**	.651**	.696**	.807**	-.374**	.709**
B	-.331**	.383**	-.236**	.298**	.640**	.515**	.419**	-.141	.382**	-.048	.873**	.698**	.789**	-.270**	.852**
C	-.104	.195*	-.282**	.070	.209*	.887**	.096	-.263**	.113	-.028	.457**	.311**	.324**	-.260**	.422**
D	1	.168	-.466**	-.564**	-.265**	-.067	-.727**	-.620**	-.674**	.655**	-.326**	-.401**	-.614**	.310**	-.438**

E	.168	1	-.255**	-.287**	-.273**	.226*	-.076	-.401**	.186*	.353**	.397**	.255**	.261**	-.119	.237**
F	-.466**	-.255**	1	.442**	-.039	-.271**	.411**	.737**	.494**	-.634**	-.209*	-.015	.257**	.016	-.147
G	-.564**	-.287**	.442**	1	.443**	.041	.635**	.581**	.732**	-.618**	.243**	.404**	.545**	-.244**	.311**
H	-.265**	.272**	-.039	.443**	1	.183*	.551**	.052	.438**	.176*	.649**	.778**	.664**	-.217*	.680**
AA	-.067	.226**	-.271**	.041	.183*	1	.059	-.278**	.095	.041	.394**	.233*	.288**	-.162	.370**
BB	-.727**	-.076	.411**	.635**	.551**	.059	1	.615**	.756**	-.720**	.462**	.525**	.701**	-.321**	.504**
CC	-.620**	.401**	.737**	.581**	.052	-.278**	.615**	1	.666**	-.807**	-.156	.095**	.307**	-.148	.006
DD	-.674**	-.186*	.494**	.732**	.438**	.095	.756**	.666**	1	-.738**	.348**	.429**	.666**	-.270**	.438**
EE	.655**	.353**	-.634**	-.618**	-.176	.041	-.720**	-.807**	-.738**	1	-.026	-.241**	-.417**	.282**	-.115
FF	-.326**	.397**	-.209**	.243**	-.649**	.394**	.462**	-.156	.348**	-.026	1	.718**	.766**	-.272**	.842**
GG	-.401**	.225**	-.015	.404**	.778**	.233**	.525**	.095	.429**	-.241**	.718**	1	.730**	-.284**	.749**
X	-.614**	.261**	.257**	.545**	.664**	.288**	.701**	.307**	.666**	-.417**	.766**	.730**	1	-.302**	.781**
Y	.310**	-.119	.016	-.244**	-.217*	-.162	-.321**	-.148	-.270**	.282**	-.272**	-.284**	-.302**	1	-.292**
Z	-.458**	.237**	.147	.311**	.680**	.370**	.504**	.006	.438**	-.115	.842**	.749**	.781**	-.292**	1

Note. N = 135.
* $p < .05$
** $p < .01$