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# Massachusetts Youth Screening Instrument Long-Term Outcomes and Scale Stability

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**MASSACHUSETTS YOUTH SCREENING INSTRUMENT LONG-  
TERM OUTCOMES AND SCALE STABILITY**

by

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## ABSTRACT

### MASSACHUSETTS YOUTH SCREENING INSTRUMENT-2 (MAYSI-2) LONG-TERM OUTCOMES AND SCALE STABILITY

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The Massachusetts Youth Screening Instrument-2 (MAYSI-2; Grisso & Barnum, 2006) was developed in 1998 to offer an efficient measure for identifying adolescents within the juvenile justice system in need of further psychiatric evaluation, treatment, or specialized care. Since the instrument's publication, several studies have evaluated the psychometric properties and clinical utility of the MAYSI-2. The current study adds to the literature examining the reliability and validity of this measure. Specifically, the current study sought to evaluate the long-term characteristics and predictive utility of the MAYSI-2 scale scores. This study utilized a sample of 8,929 boys ( $n = 6,780$ ) and girls ( $n = 2,149$ ) admitted into one of Virginia's 25 detention facilities between July 2004 and June 2005. During this 12-month period the juvenile detainees were administered the MAYSI-2 from once to as many as nine times, with approximately 35% who had reoffended on at least one occasion. T-tests revealed significantly different MAYSI-2 scale scores for boys and girls. Thus, all analyses were conducted separately by gender. Among both boys and girls, correlations based on number of days between MAYSI-2 administrations revealed stronger test-retest correlational values with briefer time intervals (< 60 days versus > 60 days). A series of repeated measures ANOVAs compared mean MAYSI-2 scale scores across the first three test administrations. Results from these analyses revealed significant decline in test scores on four out of seven

MAYIS-2 scales for boys (Angry-Irritable, Depressed-Anxious, Somatic Complaints, and Traumatic Experiences) and four out of six MAYIS-2 scales for girls (Angry-Irritable, Depressed-Anxious, Somatic Complaints, and Suicide Ideation). Logistical regression analyses were conducted to identify significant predictors of recidivism. Results yielded four significant predictors for boys (Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, and Somatic Complaints) and three significant predictors for girls (Alcohol/Drug Use, Angry-Irritable, and Somatic Complaints). Overall, correct classification was 63.9% for boys and 68.8% for girls. Analyses evaluating the relationship between MAYSI-2 scale scores and length of detention stay were not significant. This study contributes to the literature evaluating the psychometric properties of the MAYSI-2. Recommendations for further research are included.

To My Parents and My Husband Mark  
Thank You for Everything

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## CHAPTER I

### INTRODUCTION

Although estimates vary, data indicate that nearly two-thirds of juvenile offenders meet minimum criteria for at least one psychiatric disorder other than conduct disorder (Grisso, 2004, 2005). In comparison to data from the general adolescent population, which are closer to 20% (U.S. Dept of Health and Human Services, 1999), juvenile offenders appear to be diagnosed with psychiatric disorders at a rate that is two to three times higher (e.g., Kazdin, 2000). These data on mental illness in the juvenile justice system have important implications for understanding how to treat these individuals appropriately. To address mental illness within the juvenile justice system, appropriate procedures for identifying mental health needs among juvenile offenders is critical. These data also raise questions concerning particular variables related to mental health that might predict juvenile reoffense. The current study adds to the literature that evaluates the reliability and validity of a widely used screening measure, the Massachusetts Youth Screening Instrument-2 (MAYSI-2; Grisso & Barnum, 2001, 2006). The present study also examines long-term characteristics of MAYSI-2 scale scores and other variables that might be related to reoffense status.

#### *The Juvenile Justice System*

##### *History of the Juvenile Justice System*

Prior to the 19<sup>th</sup> century, no suitable method existed for managing and punishing juvenile offenders. Delinquent youths were either forced into servitude or punished in the

criminal justice system as adults (Ferro, 2003). Recognizing the need to develop a better system for handling offending minors, in the early 1800's, many United States cities introduced shelter houses and reformatories for juvenile delinquents (Ferro, 2003). In 1899, the Illinois Juvenile Court Act helped to establish the first juvenile court in Chicago by separating the juvenile from the criminal court and probation system. Courts dedicated to hearing juvenile cases were introduced across the United States, and although all states had some form of juvenile court law by 1945, it was not until 1974 that federal legislation was developed to regulate the treatment and handling of juvenile offenders. The Juvenile Justice and Delinquency Prevention Act of 1974 deinstitutionalized status offenders, removed juvenile offenders from adult facilities, provided support for the development of delinquency prevention programs, and established better systems for managing runaway minors (McNeece & Jackson, 2004). The Juvenile Justice and Delinquency Act has been amended several times, with the most recent amendment in 2002.

### *The Juvenile Justice Process*

Although current processing of juvenile offenders in the United States varies by jurisdiction, the common procedure for handling cases typically includes intake, diversion, detention, adjudication, disposition, and probation. Figure 1 outlines this process.

A juvenile's first contact with law enforcement typically occurs after a community member files a report, or upon direct observation by a police officer (Ferro, 2003). If there is evidence that the juvenile committed an offense, the case is either diverted or formally processed within the justice system. Diversion, which is commonly

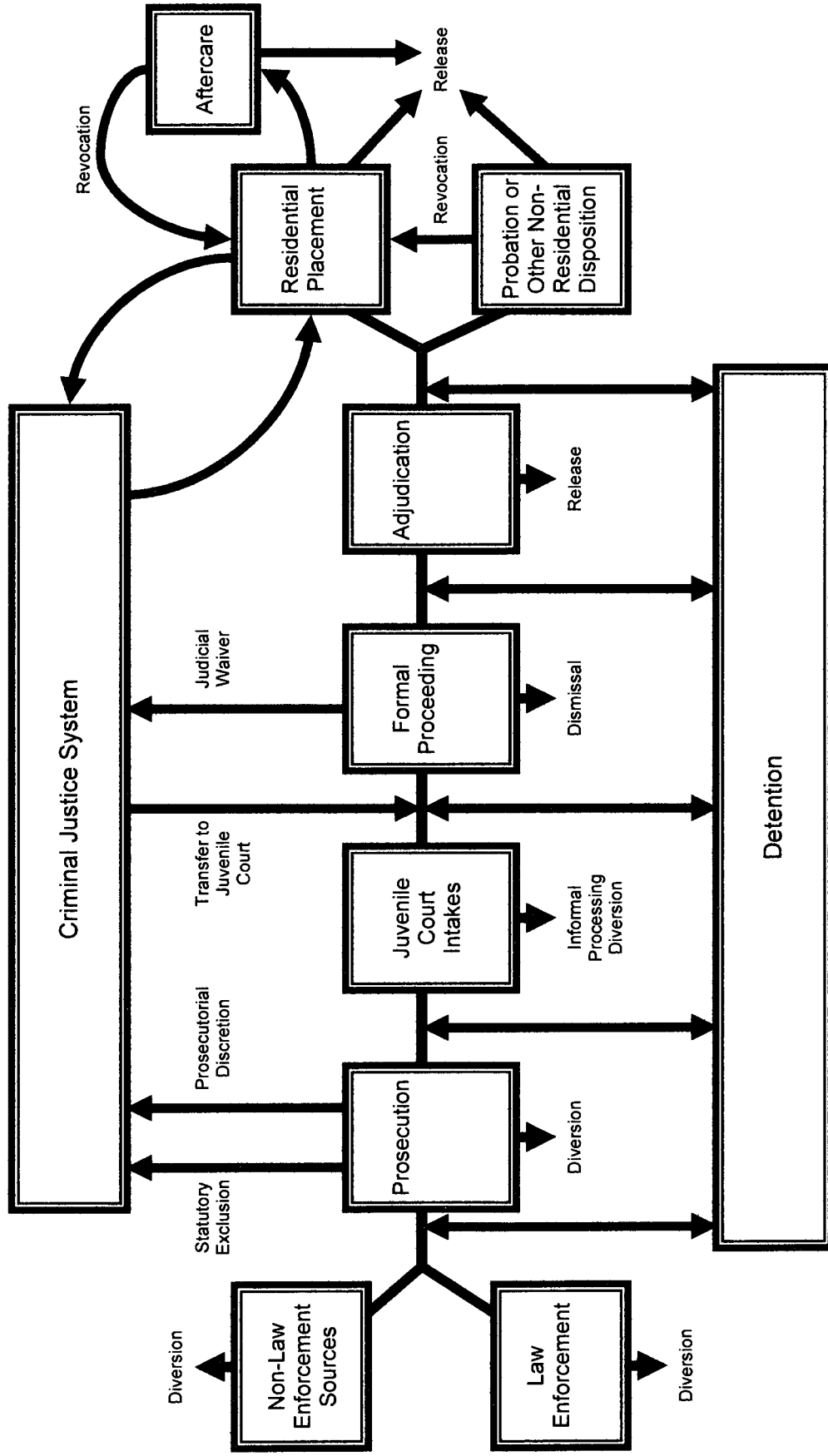
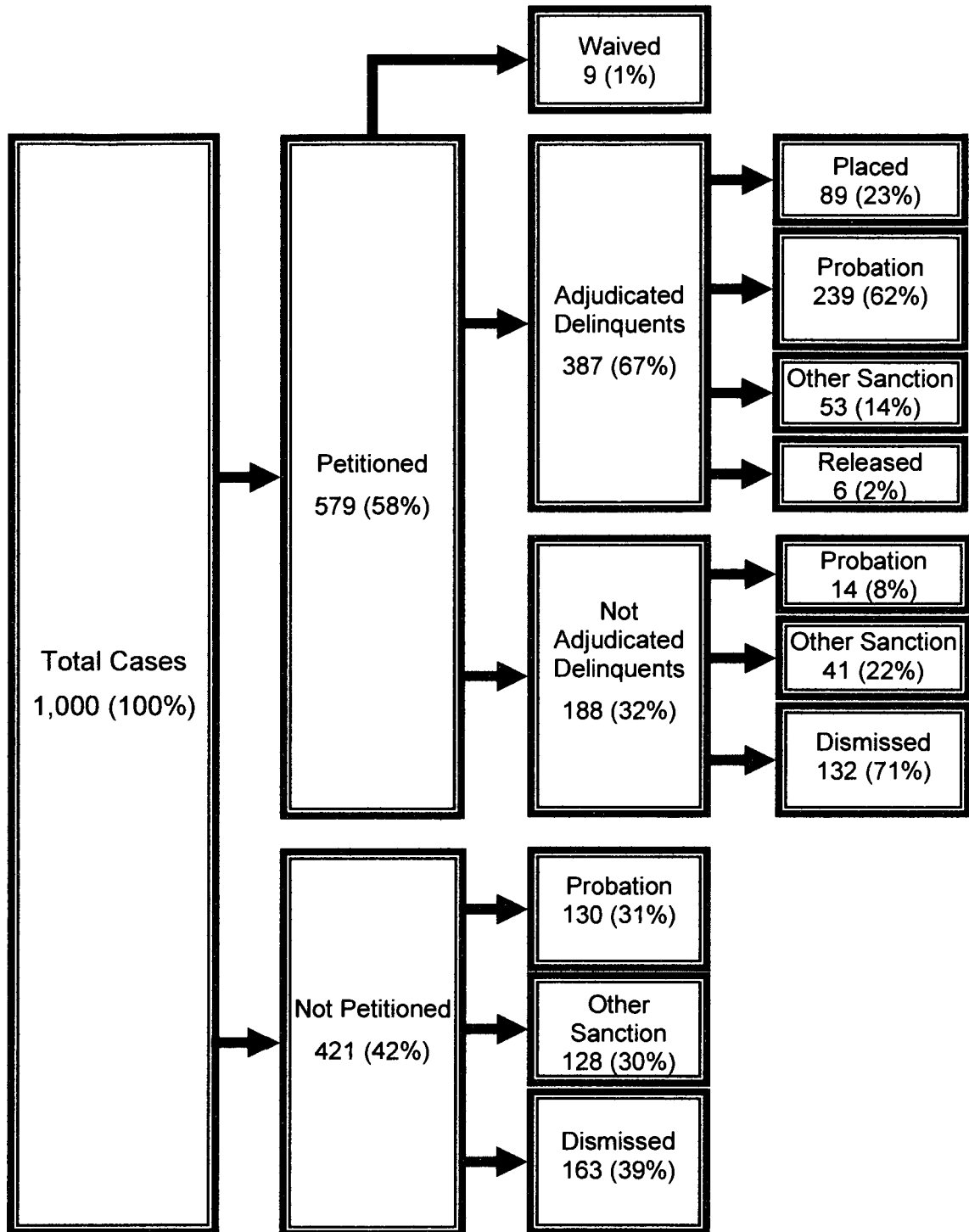


Figure 1. Stages of delinquency case processing in the juvenile justice system. Source: Figure adapted from Snyder, H. N., & Sickmund, M. (2006). *Juvenile offenders and victims: 2006 National Report*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

referred to as informal probation, involves the juvenile's placement in a community-based program, such as counseling, community service, or an Alternative Dispute Resolution (Furro, 2003). In contrast, if the courts elect to prosecute, the juvenile will either be sent to detention or released to the custody of his or her legal guardian(s). To detain a minor for an extended length of time, a detention hearing must be held, and the juvenile granted the right to counsel. In cases in which the prosecution team or intake officer believe that the minor ought to be prosecuted in criminal court, a waiver hearing (also called a transfer or fitness hearing) is conducted and the judge decides whether to waive jurisdiction over the minor. The decision to waive jurisdiction must be made prior to adjudication (i.e., the juvenile court trial). During the adjudication hearing, if the adolescent is found to be guilty, he or she faces disposition (i.e., sentencing). Generally, recommendations from the probation department, social agencies, and psychiatric evaluations are used to determine appropriate disposition for juvenile offenders. Disposition may involve dismissal, probation, suspended judgment, placement into community treatment programs, or commitment to a state institution for juvenile offenders. Often, the process of disposition can be a relatively lengthy one while all information about the juvenile is collected and while the best course of action is considered.

Figure 2 presents national data on the handling of cases within the juvenile justice system for the year 2002. As seen in Figure 2, 42% of all juveniles are not prosecuted. Among those who are prosecuted, approximately 1% is waived to the criminal justice system, 67% are adjudicated, and 32% are diverted after prosecution. The majority of adjudicated delinquents (62%) are placed on probation and approximately 23% of



*Figure 2.* Handling of cases in the juvenile justice system for typical 1,000 cases. Cases are categorized by their most severe or restrictive sanction. Details may not add to totals because of rounding.

*Source.* Figure adapted from Stahl, A. L., Puzanchera, C., Sladky, A., Finnegan, T.A., Tierney, N., & Snyder, H.N. (2005). *Juvenile Court Statistics 2001–2002*. Pittsburgh, PA: National Center for Juvenile Justice.

adjudicated juveniles (less than 9% of all delinquency cases) are placed in a correctional facility.

### *Juvenile Delinquency*

#### *Juvenile Offense Data*

Snyder and Sickmund (2006) provided a broad array of data on juvenile arrests (unless otherwise noted, the remainder of this section is based on the Snyder and Sickmund report). Juvenile delinquency generally falls into two main categories: status offenses and criminal offenses. Status offenses are defined as delinquent acts that are against the law only if committed by a minor, and include running away, truancy, ungovernability, curfew violations, or liquor law violations. In contrast, criminal offenses are those that can lead to arrest for a juvenile as well as for an adult. Criminal acts are generally categorized as violent crimes against a person (e.g., murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault) or nonviolent property crimes (e.g., burglary, larceny-theft, motor vehicle theft, arson), but can also include other illegal activities such as fraud, embezzlement, possession of a weapon, and so forth.

Each year, the Federal Bureau of Investigations (FBI) Uniform Crime Reporting Program collects data on the incidents and nature of crimes committed in the United States. These data are generally categorized according to crime index (i.e., violent crime and property crime) to aid in tracking criminal activities. According to these data, in 2003, approximately 2.2 million juveniles were arrested, 92,300 of which were for violent crimes and 463,300 for non-violent or property crimes. Individuals under the age of 18 represent about 25% of the United States resident population and account for 16% of all arrests (15% of male arrests and 20% of female arrests). Approximately 71% of



juvenile arrestees are male, 71% of offenders are White while 27% are African American, and 68% of arrests are for juveniles between the ages of 16 and 17 years. The three most frequent juvenile offenses, according to national statistics, include larceny-theft, simple assault, and drug abuse violations. See Table 1 for further data on frequently committed offense categories.

Table 1

*The Ten Most Frequently Occurring Offenses Among Juvenile Arrests*

Offense	No. of Juveniles Arrested
Total	2,220,300
Larceny-theft	325,600
Simple assault	241,900
Drug abuse violation	197,100
Disorderly conduct	193,000
Liquor law violation	136,900
Curfew and loitering law violation	136,500
Runaway status offense	123,600
Vandalism	107,700
Burglary	85,100
Aggravated assault	61,490

*Note.* Adapted from Snyder, H. N., & Sickmund, M. (2006). *Juvenile offenders and victims: 2006 National Report*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Although these numbers are staggering and signify an undeniable social issue, juvenile crime appears to be on the decline. Between 1994 and 2003, there was an 18% reduction in the total number of juvenile arrests, with a 22% decline for male juvenile arrests and a 3% decline for female juvenile arrests. Of great importance, the arrest rate

for juvenile violent crime is at its lowest since the late 1980's. From 1980 to 1988, the juvenile violent crime arrest rate remained relatively stable; however, in 1989 the number of juvenile violent crime arrests began to rise. From 1989 to 1994, when rates peaked, there was a 61% increase in juvenile violent arrest rates. Since 1994, however, these rates have gradually declined each year. Arrest rates for property crimes are also steadily declining. Although there was little variance (less than 10%) in juvenile property crime arrest rates from 1980 to 1998, property crime arrest rates declined 39% from 1997 to 2003.

Although overall arrest rates have declined for most offenses (e.g., violent crimes, property crimes, weapons violations, prostitution), the arrest rates for some offense categories have increased substantially since 1980. For example, between 1980 and 2003, the juvenile arrest rate for simple assault more than doubled. Among all adolescents, drug abuse violations have increased by 19% since 1994, and arrests for driving under the influence have increased by 33%.

There are also important exceptions in the data on declining delinquency rates for female offenders. For example, the proportion of female juvenile offenders entering the juvenile justice system has increased in the past two decades. In 1980, females accounted for 20% of all juvenile arrests, but in 2003, the proportion of juvenile female arrestees was 29%. The greatest increase was seen in the proportion of females arrested for property crimes. From 1980 to 2003, the percentage of female juvenile arrests increased from 10% to 18% for Violent Crime Index offenses and from 19% to 32% for Property Crime Index offenses.

In evaluating the official arrest data, it is important to note that these data provide limited information about the scope and nature of juvenile delinquency because many delinquent acts are never brought to the attention of juvenile justice agencies. For example, as stated above, 42% of all juveniles initially arrested are diverted or informally processed (Snyder & Sickmund, 2006). As one might therefore expect, most adolescent self-report surveys suggest that a much larger proportion of juveniles engage in illegal activities than are indicated by official data (e.g., Roberts, 2004).

### *Re-Offense Data*

The act of recidivism, or reoffending, is important for measuring outcomes in juvenile and adult justice settings. However, definitions and measurement methodologies of this critical outcome variable vary widely. In the most general sense, recidivism refers to the repetition of illegal behavior. However, three general categories are most commonly applied to the definition and measurement of recidivism: rearrest rates, reconviction rates, and reincarceration rates (Virginia Department of Juvenile Justice [DJJ] Data Resource Guide, 2006). There are no national data for recidivism rates due to the large variability between juvenile justice systems within different state jurisdictions, as well as because of the lack of consensus on how and when to measure reoffense. However, as described below, individual studies suggest that recidivism rates are exceptionally high (e.g., Virginia DJJ, 2005).

The Virginia DJJ (2005) collected reoffense data from 27 states that employed comparable methodologies for tracking recidivism among juveniles released from state incarceration. During a 12-month follow-up period for juvenile delinquent or criminal offenses, the study reported that an average of 55% of juveniles were rearrested (based on

data from Florida, New York, and Virginia). Approximately 45% of juvenile cases were rereferred to court within the 12-month follow-up period (based on data from Colorado and Maryland) and approximately 33% were reconvicted or readjudicated (based on data from Arkansas, Florida, Georgia, Kentucky, Maryland, North Dakota, Oklahoma, and Virginia). Furthermore, approximately 24% of all juvenile delinquent or criminal offenders were reincarcerated or reconfined within 12 months (based on data from Arizona, Ohio, and Texas).

More recently, the Virginia DJJ (2006) released data on juvenile reoffending patterns in the Commonwealth of Virginia for 2000 to 2005. For this data, recidivism was measured by reconviction, or a guilty adjudication. Based on this measurement of recidivism, in 2002, the 12-month recidivism rates were 43% for juveniles released from a juvenile correctional facility and 26% for juveniles placed on probation. At the 24-month follow-up, reconviction rates increased to 61% and 40%, for those released from a juvenile correctional center and those placed on probation, respectively. At the 36-month follow-up, reconviction rates reached 69% for adolescents released from a juvenile correctional center and 48% for adolescents previously placed on probation. When comparing juvenile offenders by gender and race, males and African American juveniles were generally reconvicted with the highest frequency. For example, after 12 months, approximately 42% of boys versus 27% of girls released from the juvenile correctional complex were reconvicted, whereas 28% of boys versus 19% of girls previously placed on probation were reconvicted. In comparing juveniles based on race, 42% of African American adolescents, 39% of White adolescents, and 24% of Hispanic adolescents previously released from the juvenile correctional complex were reconvicted after 12

months. Among those previously placed on probation, 31% of African American adolescents, 22% of White adolescents, and 22% of Hispanic adolescents were reconvicted.

To better evaluate recidivism risk and make appropriate placement decisions, researchers have evaluated variables related to juvenile recidivism (for reviews see Cottle, Lee, & Heilbrun 2001; Loeber & Dishion, 1983). Although some studies have revealed consistent gender and offense category effects, the preponderance of literature on risk factors associated with reoffending among juvenile offenders is inconclusive (Cottle et al., 2001). However, a recent meta-analysis by Cottle et al. (2001) offers a useful summation of previous findings. These researchers analyzed data from 22 articles published between 1983 and 2000, and identified 23 significant predictors (out of 30 possible predictor variables) associated with recidivism. Results from the meta-analysis are provided in Table 2. As can be seen, the three best predictors of recidivism included younger age at first commitment, younger age at first contact with the law, and less severe forms of psychopathology.

#### *Mental Health and Juvenile Delinquency*

Until recently, no reliable data existed for determining the prevalence rate of psychiatric illness among juvenile offenders (e.g., Coccozza & Skowrya, 2000; Grisso, 2004; Shufelt & Coccozza, 2006; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Previous estimates vary widely, ranging from 20% (Coccozza & Skowrya, 2000) to 100% (McManus, Alessi, Grapentine, & Brickman, 1984). Possible explanations for discrepancies in rates of psychiatric illness include the following: inconsistency in defining psychiatric disorders; disagreement on which disorders to include for study (e.g.,

Table 2

*Predictors of Recidivism Arranged in Descending Order of Effect Size*

Rank Order	Variable	Zr
1.	Younger age at first commitment	.346***
2.	Younger age at first contact with the law	.341***
3.	Less severe forms of psychopathology (e.g., stress, anxiety)	.305***
4.	Family problems	.277***
5.	Conduct problems	.255***
6.	Poor use of leisure time	.233***
7.	Associating with delinquent peers	.204***
8.	Longer length of first incarceration	.187***
9.	More out-of-home placements	.184***
10.	More prior commitments	.174***
11.	More serious offense category	.159***
12.	Low standardized achievement scores	.153***
13.	Presence of substance abuse	.149***
14.	Low Full Scale IQ score	.142***
15.	History of special education	.130**
16.	Risk assessment instruments	.118***
17.	History of physical or sexual abuse	.112***
18.	Gender (male)	.111***
19.	Low Verbal IQ scores	.111**
20.	Raised in a single parent home	.070***
21.	Severe pathology (e.g., psychosis, suicidality)	.069
22.	Race (minority status)	.067***
23.	Lower socioeconomic status	.065***
24.	More prior arrests	.058***
25.	Poor school attendance	.048
26.	Parent pathology	.047
27.	Low Performance IQ score	.031
28.	Poor academic achievement	.028
29.	History of psychiatric treatment	.019
30.	Substance use	.014

*Note.* Zr = weighted mean effect size. Authors adaptation from Cottle, C. C., Lee, R. J., & Heilbrun, K. (2001). The prediction of criminal recidivism in juveniles: A meta-analysis. *Criminal Justice and Behavior*, 28, 365-394.

\*\*p<.01, \*\*\*p<.001.

whether to include disruptive and substance use disorders); nonstandardized measurement instruments; biased, nonrandom, or small samples; and variations related to setting or legal systems (Cocozza & Skowyra, 2000; Goldstein, Olubadewo, Redding, & Lexcen, 2005; Grisso, 2004; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002).

To overcome the limitations of previous research, recent efforts have focused on conducting more methodologically sound studies, which might provide more reliable data on the nature and severity of mental health problems among juvenile offenders. Table 3 provides data from four studies that established psychiatric diagnoses with empirically supported instruments and involved large samples of juvenile offenders. In the first of the most comprehensive studies, Teplin and colleagues (2002) collected data from a random sample of intakes into the Cook County Juvenile Temporary Detention Center. The sample included 1,829 boys and girls aged 10 through 18 years, inclusive. The majority of participants were male (90%) and African American (78%). The Diagnostic Interview Schedule for Children version 2.3 (DISC-2.3; Shaffer et al., 1996) was used to determine psychiatric diagnosis. The authors reported that 66% of boys and 73% of girls met the criteria for at least one psychiatric disorder. When excluding Conduct Disorder diagnoses, 61% of boys and 70% of girls still met criteria for a diagnosable disorder.

In a prevalence study conducted by Wasserman and colleagues (2002), diagnostic data were collected on 292 male juveniles recently admitted into correctional facilities in New Jersey or Illinois. Approximately half of the sample was African American and the average age was approximately 17 years. The Diagnostic Interview Schedule for Children Voice Version-IV (Voice DISC-IV; Shaffer et al., 2000) was used in this study to

Table 3

*Comparison of Psychiatric Prevalence Rates From Four Methodologically Sound Studies*

	Shufelt & Cocozza, 2006 <sup>a</sup>			Teplin et al., 2002 <sup>b</sup>			Wasserman et al., 2002 <sup>c</sup>			Wasserman et al., 2005 <sup>d</sup>		
	Total (1,400)	Boys	Girls	Boys (1,172)	Girls (657)	Boys (292)	Girls (200)	Total (991)	Boys (791)	Girls (200)		
Any psychiatric D/O	70.4	66.8	81.0	66.3	73.8	68.5	49.5	45.7	44.8	49.5		
Any D/O excluding CD	66.3	--	--	60.9	70.0	--	--	--	--	--		
Disruptive Behavior D/O	46.5	44.9	51.3	41.4	45.6	32.5	20.0	20.0	20.0	20.0		
CD	--	--	--	37.8	40.6	--	18.0	18.3	16.8	16.8		
ODD	--	--	--	14.5	17.5	--	6.4	5.3	10.5	10.5		
ADHD	--	--	--	16.6	21.4	--	1.1	1.2	0.5	0.5		
Any Substance Use D/O	46.2	43.2	55.1	50.7	46.8	50.3	25.4	26.3	22.0	22.0		
Alcohol Use D/O	--	--	--	25.9	26.5	--	--	--	--	--		
Alcohol Dependence	--	--	--	--	--	13.4	3.1	3.0	3.5	3.5		
Alcohol Abuse	--	--	--	--	--	17.1	7.0	7.3	5.4	5.4		
Marijuana Use D/O	--	--	--	44.8	40.5	--	--	--	--	--		
Marijuana Dependence	--	--	--	--	--	25.8	12.8	13.2	11.3	11.3		
Marijuana Abuse	--	--	--	--	--	15.1	9.5	9.9	8.1	8.1		
Other Substance Use D/O	--	--	--	2.4	6.9	--	--	--	--	--		
Other Substance Dependence	--	--	--	--	--	13.2	3.6	3.3	4.9	4.9		
Other Substance Abuse	--	--	--	--	--	3.9	3.0	2.8	3.8	3.8		
Mood D/O	18.3	14.3	29.2	18.7	27.6	9.6	7.4	5.9	13.0	13.0		
Dysthymia	--	--	--	12.2	15.8	0.7	0.2	0.1	0.5	0.5		
Major Depression	--	--	--	13.0	21.6	7.5	6.3	5.1	11.4	11.4		
Mania	--	--	--	2.2	1.8	2.4	0.9	1.0	0.5	0.5		



Table 3 (continued)

	Shufelt & Cocozza, 2006 <sup>a</sup>		Teplin et al., 2002 <sup>b</sup>		Wasserman et al., 2002 <sup>c</sup>		Wasserman et al., 2005 <sup>d</sup>	
	Total (1,400)	Boys Girls	Boys (1,170)	Girls (656)	Boys (292)	Girls (991)	Boys (791)	Girls (200)
Anxiety D/O	34.4	26.4 56	21.3	30.8	19.5	19.8	17.4	29.0
Panic D/O	--	-- --	0.3	1.5	4.8	2.9	2.8	3.0
Separation Anxiety D/O	--	-- --	12.9	18.6	--	26.5	25.1	32.8
Overanxious	--	-- --	6.7	12.3	--	--	--	--
PTSD	--	-- --	--	--	4.8	4.0	3.5	6.2
Generalized Anxiety D/O	--	-- --	7.1	7.3	2.1	3.5	3.6	3.1
OCD	--	-- --	8.3	10.6	4.8	5.4	5.3	5.7
Social Phobia	--	-- --	--	--	2.4	5.4	4.6	8.5
Agoraphobia	--	-- --	--	--	4.8	9.2	8.3	12.8
Specific Phobia	--	-- --	--	--	8.6	7.1	6.1	11.4

*Note.* Number in parentheses represents sample size. CD = Conduct Disorder; ODD = Oppositional Defiant Disorder; ADHD = Attention Deficit-Hyperactivity Disorder; D/O = Disorder; PTSD = Post-Traumatic Stress Disorder; OCD = Obsessive Compulsive Disorder.

<sup>a</sup>Data were collected from multiple settings and diagnoses were made using the Diagnostic Interview Schedule for Children (DISC) IV. <sup>b</sup>Data were collected from a detentional setting and diagnoses were made using the DISC-2.3. <sup>c</sup>Data were collected from a correctional setting and diagnoses were made using the DISC-IV. <sup>d</sup>Data were collected at probation intake and diagnoses were made using the DISC.

establish psychiatric diagnoses. Overall, among the male offenders, approximately 69% were identified as having at least one psychiatric disorder. No data were reported on the prevalence rate of psychiatric diagnoses excluding Conduct Disorder. In a more recent study, Wasserman et al. (2005) evaluated prevalence rates of psychiatric illness among male and female juvenile offenders in a large sample (N = 991) of youth from the Texas Juvenile Probation Commission. Twenty percent of the sample were female and 51% were Hispanic. Psychiatric diagnoses were based on results from the Voice DISC-IV (Shaffer et al., 2000). In the total sample, 46% of the juveniles met criteria for one or more psychiatric disorder.

In 2006, the National Center for Mental Health and Juvenile Justice (NCMHJJ) released data from a large-scale prevalence study of substance abuse and mental health disorders among youth involved in the juvenile justice system (summarized by Shufelt & Coccozza, 2006). Data were collected on 1,400 juveniles from three different settings within the states of Louisiana, Texas, and Washington. The juvenile justice settings where data were collected included a total of 29 community-based programs, detention centers, and secure residential facilities. The Diagnostic Interview Schedule for Children-Voice Version IV (Voice DISC-IV; Shaffer et al., 2000) was used to determine psychiatric diagnosis. Consistent with data from previous studies, an overwhelming majority (70%) of adolescent offenders met criteria for at least one psychiatric disorder. After excluding conduct disorder diagnoses, 66% of juveniles still met the minimum criteria for a psychiatric disorder. After excluding substance use disorders, 62% met the criteria for a mental disorder. Excluding both conduct disorder and substance use disorders, 46% of the sample still had a diagnosable psychiatric disorder. Importantly, the

researchers reported that approximately 27% of the total sample had a severe psychiatric disorder (e.g., bipolar disorder, major depression, or psychotic disorders).

As these data show, mental health problems in the juvenile justice system are remarkably frequent, especially when compared to prevalence rates of psychiatric disorders in the general population of youth, which is closer to 20% (Schaffer et al., 1996; U.S. Dept of Health and Human Services, 1999). Accordingly, psychiatric illness appears to be at least two to three times higher among adolescents in the juvenile justice system than in community samples of adolescents. Overall, substance-related disorders, disruptive behavior disorders, and internalizing disorders, are especially prevalent in this population (Grisso, 2004). To examine more closely how each of these mental health problems affects juvenile offenders, the prevalence data for each of these mental illness categories is discussed separately in the sections that follow.

*Substance use disorders.* In the juvenile justice system, drug- and alcohol-related disorders are among the most frequently diagnosed psychiatric illnesses. Prevalence rates for the presence of at least one substance use disorder range from 20% to 88% (Aarons et al., 2001; Atkins et al., 1999; Domalanta et al., 2003; Duclos et al., 1998; McCabe et al., 2002; Shelton, 2001; Shufelt & Cocozza, 2006; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Wasserman et al., 2002; Wasserman et al., 2005), with most estimates approximating 50%. In contrast, estimates from the general population are closer to 2% for youths aged nine to 17 years (Schaffer et al., 1996; U.S. Dept of Health and Human Services, 1999). Among juvenile delinquents, marijuana-related diagnoses are generally more prevalent than alcohol-related or other substance use disorders. For example, in a study of detained juveniles, approximately 41% of girls and 45% of boys were diagnosed

with a marijuana use disorder, whereas only 26% of girls and 26% of boys were diagnosed with an alcohol use disorder (Teplin et al., 2002). Although frequencies tended to be lower, Wasserman and colleagues (2002, 2005) observed similar patterns in their studies of juvenile delinquents. Also reported by Wasserman et al. (2002, 2005), while alcohol abuse may occur with greater frequency than alcohol dependency, drug dependency appears to be more prevalent than drug abuse.

*Disruptive behavior disorders.* Following substance use disorders, disruptive behavior disorders are the second most prevalent psychiatric illness among juvenile delinquents. Included in this category are oppositional-defiant disorder and conduct disorder. Some researchers have also included attention-deficit/hyperactivity disorder (ADHD) with this group of diagnoses because of its high rate of comorbidity and similarity in features. Although data indicate that approximately 10% of adolescents in the general population have a disruptive behavior disorder (Schaffer et al., 1996; U.S. Dept of Health and Human Services, 1999), prevalence estimates of juvenile offenders are much higher, and have ranged from 20% to 64% (Garland et al., 2001; McCabe et al., 2002; Shelton, 2001; Teplin et al., 2002; Wasserman et al., 2002; Wasserman et al., 2005). As might be expected, conduct disorders appear to be diagnosed with the highest frequency among juvenile offenders. Because the symptoms associated with conduct disorder include many behaviors that might lead to legal involvement (e.g., aggression to people, destruction of property, deceitfulness or theft, violations of rules), many researchers have suggested that including conducted disorders in prevalence studies with delinquent populations is redundant and probably not useful (e.g., Grisso, 2004). Nonetheless, reliable estimates of conduct disorder in this population have ranged from

approximately 20% to 40% (Teplin et al., 2002; Wasserman et al., 2002, 2005).

Approximately 5% to 20% of juvenile delinquents meet criteria for ADHD, oppositional defiant disorder, or both (Teplin et al., 2002; Wasserman et al., 2002, 2005). In the general population, approximately 2.2% of juveniles meet diagnostic criteria for ADHD, 2.2% meet criteria for oppositional defiant disorder, and approximately 4.4% meet criteria for conduct disorder (Schaffer et al., 1996).

*Mood disorders.* Many researchers have documented high rates of mood disorders and depressive symptoms among juvenile offenders. Prevalence estimates of affective disorder diagnoses (including dysthymia, major depression, mania, or hypomania) have ranged from 5% to 88% among juvenile offenders, with most estimates far exceeding 10% (Atkins et al., 1999; Domalanta et al., 2003; Garland et al., 2001; McCabe et al., 2002; Pliszka et al., 2000; Shelton, 2001; Shufelt & Coccozza, 2006; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Wasserman et al., 2002, 2005). For the most part, these estimates are considerably higher than prevalence rates of mood disorders in the general population, which is roughly 6% (Schaffer et al., 1996; U.S. Dept of Health and Human Services, 1999). Within this group of diagnoses, major depression occurs with the greatest frequency, especially among girls. For example, Teplin et al. (2002) reported that approximately 22% of girls and 13% of boys in their sample of detainees met the criteria for a major depressive episode. In a sample of juvenile offenders on probation, approximately 11% of girls and 5% of boys met criteria for a diagnosis of major depression (Wasserman et al., 2005). In a smaller sample of mostly male juvenile delinquents, although 23% met criteria for a current diagnosis of major depression, the lifetime prevalence rate was 40% (Rohde, Mace, & Seeley, 1997).

*Anxiety disorders.* High rates of anxiety disorders (e.g., panic disorder, post-traumatic stress disorder, generalized anxiety disorder, obsessive compulsive disorder, social phobia, specific phobia) have also been documented within a juvenile offender population. However, prevalence estimates of anxiety disorders have varied widely from study to study, ranging from approximately 2% to 72% (Atkins et al., 1999; Duclos et al., 1998; Garland et al., 2001; Rohde et al., 1997; Shelton, 2001; Shufelt & Cocozza, 2006; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Wasserman et al., 2002, 2005). Some of the most reliable estimates have indicated that an anxiety disorder afflicts approximately 20% to 30% of juvenile delinquents (Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2002, 2005). In contrast, approximately 13% of adolescents in the general population meet minimum diagnostic criteria for an anxiety disorder (Schaffer et al., 1996; U.S. Dept of Health and Human Services, 1999). Clearly, data suggest that anxiety disorders are also diagnosed with greater frequency in juvenile delinquent populations than in the general population.

*Gender effects.* Studies that have examined prevalence estimates for boys and girls separately have suggested that the rates of mental illness vary significantly between genders. Overall, female offenders appear to be diagnosed with a psychiatric disorder at a higher rate than are boys (Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2005). In recent research, a higher proportion of girls than boys have been diagnosed with at least one psychiatric disorder. Additionally, as compared to boys, girls in the juvenile justice system appear to be consistently diagnosed with an affective disorder, an anxiety disorder, or both more frequently. Female offenders may be especially likely to be diagnosed with major depression. For example, Wasserman et al. (2005) reported a

significant difference in the prevalence of major depression among the boys and girls in their sample; 11% of girls met the minimum diagnostic criteria for major depressive disorder and 5% of boys met diagnostic criteria. Similarly, Teplin et al. (2002) reported that girls were 1.86 times more likely to be diagnosed with a major depressive episode than were boys.

In contrast to the high prevalence rates for internalizing disorders among female offenders, prevalence data for disruptive behavior disorders and substance use disorder has been less conclusive. For example, Teplin et al. (2002) and Wasserman et al. (2005) reported slightly higher rates of a substance use disorder among boys (51% and 26%, respectively) than among girls (47% and 22%, respectively); however, the NCMHJJ Prevalence Study (Shufelt & Cocozza, 2006) reported higher prevalence rates for girls (55%) than for boys (43%). Moreover, prevalence estimates for juvenile delinquents with disruptive behavior disorders are generally equal among boys and girls (Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2005).

*Prevalence based on race.* Although few studies examine differences in prevalence rates of mental illness based on race, preliminary data suggest that meaningful differences in the prevalence of psychiatric diagnoses exist between racial groups. In the Teplin et al. (2002) study, psychiatric disorder prevalence data for African American, Non-Hispanic White, and Hispanic juvenile delinquents were compared for boys and girls separately. Overall, rates of psychiatric illness in this study were highest for Non-Hispanic White adolescents and lower for African American adolescents. More specifically, when compared to African American boys and girls, White boys and girls were significantly more likely to meet minimum diagnostic criteria for any of the

diagnostic categories both when conduct disorder was included (boys: 82% vs. 65%; girls: 86% vs. 71%) and when conduct disorder was excluded (boys: 73% vs. 59%; girls: 84% vs. 67%). White boys were also more likely than Hispanic boys to be diagnosed with any disorder (82% vs. 70%; includes conduct disorder diagnoses) and White girls were more likely than Hispanic girls to be diagnosed with any disorder (84% vs. 70%; excluding conduct disorder). Other significant findings for boys included higher rates of any anxiety disorder for Hispanic boys (26%) when compared to White boys (14%), higher rates of any disruptive behavior disorder for White boys (60%) compared to African American boys (40%) and Hispanic boys (43%), and higher rates of any substance use disorder for White boys (63%) compared to African American boys (49%). Among the sample of girls, White girls and Hispanic girls were significantly more frequently diagnosed with any disruptive behavior disorder (61% and 57%, respectively) when compared to African American girls (57%). White girls were also more frequently diagnosed with any substance abuse disorder (62%) than were African American girls (42%).

*Comorbidity.* To further complicate the relationship between juvenile delinquency and mental health, data indicate that a very large proportion of juvenile offenders meet criteria for two or more psychiatric disorders. Data from various studies suggest that between 46% and 83% of all juvenile offenders have comorbid disorders (e.g., Abram, Teplin, McClelland, & Dulcan, 2003; Otto et al., 1992; Uzlen & Hamilton, 1998). For example, in one study involving 1,892 detained juveniles (Abram et al., 2003), 57% of girls and 46% of boys met criteria for two or more psychiatric disorders including mood disorders, psychosis, anxiety disorders, ADHD, disruptive behavior disorders, and



substance-related disorders. In fact, juveniles were more likely to be diagnosed with comorbid disorders than with a single psychiatric disorder (17% of girls and 20% of boys had only one diagnosis). Moreover, comorbidity rates remained high even after excluding the commonly occurring conduct and substance use disorders (34% for girls and 24% for boys). In a multi-state study of juvenile offenders (Shufelt & Coccozza, 2006), 79% of juveniles with a psychiatric disorder met criteria for two or more diagnoses and 60% met criteria for three or more diagnoses. Timmons-Mitchell et al. (1997) used self-report measures to identify mental illness among adolescents in a state correctional institution and reported that boys and girls had an average of approximately five psychiatric diagnoses.

### *Addressing Mental Health Concerns in the Juvenile Justice System*

#### *Assessment and Screening Techniques*

The Juvenile Delinquency and Prevention Act of 2002 emphasized the need to address mental health issues among juvenile offenders. Advocates, clinicians, and researchers alike argue for improved intervention strategies for handling psychiatric illness within the juvenile justice system (e.g., Grisso, 2004; 2005). For example, Grisso (2004) emphasized that facilities have custodial, due process, and public safety obligations to effectively assess and address mental health concerns of juvenile offenders. More specifically, Grisso (2005) recommended changes in four major areas. First, there is a need for more effective diversion of adolescents with mental health symptom. Second, more effective emergency mental health services must be in place for those who enter the juvenile justice system. Third, juvenile justice programming with better resources and thorough plans for addressing mental health disorders among juvenile

offenders must be developed to focus on reducing recidivism. Finally, facilities need to improve the way in which juveniles with mental health problems are managed after returning to the community.

To address mental health concerns of juvenile offenders as they enter and reenter the juvenile justice system, facilities must be able to identify effectively those with psychiatric problems (Grisso, 2005). Traditional diagnostic procedures include structured and unstructured DSM-IV diagnostic interviews (e.g., the Diagnostic Interview for Children and Adolescents; Herjanic & Reich, 1978), comprehensive personality and psychiatric symptom inventories (e.g., Minnesota Multiphasic Personality Inventory-Adolescents; Butcher et al., 1992; Millon Adolescent Clinical Inventory; Millon, Millon, & Davis, 1993), and various brief symptom inventories (e.g., Brief Symptom Inventory; Derogatis, 1993). However, many of these procedures require substantial time as well as financial investments, and require highly trained clinicians to administer, score, and interpret. Methods to assess mental health problems among juvenile offenders must take into account the population being served, the instruments' feasibility with the target population, and the relevance of the measure (Grisso, 2004). New screening and assessment procedures have been developed to address these concerns. Mental health screening instruments, which can be an extremely efficient means for evaluating mental health concerns among all individuals entering the juvenile justice system, are used to separate adolescent offenders most likely to have mental health problems from those who are unlikely to have mental health problems. After adolescents with an increased likelihood of presenting with mental illness have been identified, the limited resources

available can be more efficiently allocated only to those individuals requiring more comprehensive mental health assessment, special services, or treatment.

*The Massachusetts Youth Screening Instrument-2*

One screening measure that was developed specifically for use within the juvenile justice system is the Massachusetts Youth Screening Instrument (MAYSI; Grisso & Barnum, 1998). First published in 1998, the MAYSI is currently in its second edition (Grisso & Barnum, 2001), with its most recent test manual and updated norms published in 2006 (Grisso & Barnum, 2001). Developed to be cost effective, brief, widely applicable, and simple to administer, score, and interpret, the MAYSI-2 provides information about current mental health symptoms that may be indicative of a more serious psychiatric disorder (Grisso & Barnum, 2006). As the name suggests, the MAYSI-2 is a screening instrument meant to identify those juveniles in need of further psychiatric evaluation or specialized care (e.g., suicidal monitoring). Recent estimates indicate that the MAYSI-2 is currently employed system-wide in 32 U.S. states (Grisso & Quinlan, 2005).

The MAYSI-2 was developed to be used with boys and girls aged 12 to 17 years. Complete administration and scoring generally requires less than 15 minutes. The MAYSI-2 yields seven scale scores, which assess alcohol and drug use (Alcohol/Drug Use), anger and irritability (Angry-Irritable), internalized distress (Depressed-Anxious), health concerns (Somatic Complaints), suicidal risk (Suicide Ideation), unusual thought content (Thought Disturbance), and trauma history (Traumatic Experiences). The manual provides “Cautionary” and “Warning” cut-off scores for each scale to identify juveniles with meaningful scale elevations (Grisso & Barnum, 2006).

Since the instrument's publication, several studies have evaluated the psychometric properties and clinical utility of the MAYSI and MAYSI-2. Although the research is relatively limited, data generally support the use of the MAYSI-2 in a variety of juvenile justice settings. Several studies have addressed internal properties of the MAYSI-2 scales. For example, two independent studies have successfully replicated the factor structure of the MAYSI-2 (Archer, Stredny, Mason, & Arnau, 2004; Grisso, Barnum, et al., 2001), lending support to the current scale composition. Test-retest reliability also appears adequate, especially with shorter intervals between administrations. For example, Grisso and colleagues (Grisso, Barnum, et al., 2001) reported test-retest reliability coefficients that ranged from .53 to .89 (average time between tests was 8.3 days for boys and 5.6 days for girls). Cauffman (2004) also evaluated test-retest reliability of MAYSI-2 scale scores, comparing coefficients of early repeat offenders (less than 87 days) and late repeat offenders (greater than 87 days). For early repeat offenders, test-retest coefficients ranged from .44 to .70; for late repeat offenders, coefficients ranged from .27 to .49.

Concurrent validity of the MAYSI-2 scales has been examined using conceptually related scores on self-report measures, background data, and diagnostic information. In a sample of detained boys and girls used during MAYSI-2 scale development, the test authors (Grisso, Barnum, et al., 2001) correlated MAYSI-2 scale scores with scores from the Millon Adolescent Clinical Inventory (MACI; Millon, 1993) and the Youth Self Report (YSR; Achenbach, 1991). In these analyses, the majority of MAYSI-2 scales showed the highest correlations with conceptually relevant extra-test variables. For example, Alcohol/Drug Use scale scores correlated most strongly with the MACI

Substance-Abuse Proneness scale scores, YSR Delinquent Behavior scale scores, and YSR Externalizing scale scores. However, the MAYSI-2 Angry-Irritable scale produced inconsistent results and was strongly correlated with a variety of conceptually related and conceptually unrelated MACI scale scores (Substance-Abuse Proneness, Impulsive Propensity, and Suicidal Tendency) and YSR scale scores (Externalizing problems, Aggressive Behavior, Delinquent Behavior, Internalizing problems, and Attention Problems). Also noteworthy, while the MAYSI-2 Depressed-Anxious scale scores correlated strongly with the Depressive Affect MACI scale scores, its correlation with the Anxious Feelings MACI scale scores were minimal. Similar correlational patterns were observed between MAYSI-2 and MACI scale scores in a study involving chronic male juvenile offenders (Butler, Loney, & Kistner, 2007). Archer et al. (2004) evaluated concurrent validity of select MAYSI-2 scale constructs using adolescent life events interview data. The authors reported that Suicide Ideation scale scores were significantly positively related to reports of suicide ideation and prior attempts. Similarly, Alcohol/Drug Use scale scores were significantly positively correlated with substance abuse history. No significant relationship was found between Traumatic Experiences scale scores and reports of physical or sexual abuse.

Several studies have explored the association between MAYSI-2 scale scores and the Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 1996). Generally, these studies have demonstrated a relationship between MAYSI-2 scale scores and parallel DISC diagnoses (Hayes, McReynolds, & Wasserman, 2005; Wasserman, McReynolds, Ko, Katz, Cauffman, Haxton, et al., 2004). For example, Wasserman, McReynolds, et al. (2004) reported that the MAYSI-2 effectively identified boys and

girls who received psychological diagnoses based on DISC-IV results and was especially accurate in identifying juveniles with a history of recent suicide attempts. The authors noted that the MAYSI-2 was most successful in identifying youths with co-morbid disorders rather than with a single diagnosis. For example, while 3.2% of adolescents meeting minimum criteria for two or more diagnoses scored below all MAYSI-2 caution cut-off scores, 10.9% of adolescents with only one diagnosable disorder scored below MAYSI-2 cut-off scores.

Researchers have also reported on the relationship of MAYSI and MAYSI-2 scale scores with important outcome variables. Marczyk and colleagues (2003) reported that reoffending juveniles produced higher MAYSI scores on the Angry-Irritable, Anxiety, Fighting, and Suicide Ideation scales, and lower MAYSI scores on the Alcohol/Drug Use, Somatic Complaints, Thought Disturbance, and Traumatic Experiences scales. In a more recent study, Marczyk and colleagues (2005) computed a MAYSI total score and reported that serious juvenile offenders with higher total scores were more likely to be waived and prosecuted in the adult criminal system rather than in the juvenile justice system. Among the MAYSI scales, the authors found the Alcohol/Drug Use scale to be the best single predictor of waiver status (i.e., prosecuted as an adult or juvenile).

Butler et al. (2007) reported a relationship between select MAYSI-2 scale scores and institutional maladjustment. Elevated scores on the Angry-Irritable scale significantly predicted major behavioral infractions and correctly classified 59% of juveniles requiring one or more Intensive Supervised Placements (due to behaviors suggesting threat to self or others) during the first 90 days of rehabilitation. In addition, using the published cut-off scores for the MAYSI-2 Suicide Ideation scale, 88% of juveniles were correctly

classified in terms of their status for correct or incorrect placement on suicide watch. However, 8% of adolescents with scores in the normal range were placed on suicide watch (false negative), whereas 50% with elevated scores were not placed on suicide watch (false positive).

### *Current Study*

#### *Study Objectives*

A substantial body of literature has focused on the MAYSI and MAYSI-2, lending support to the instrument's utility and validity. Nonetheless, a considerable amount of research remains to be completed on a number of fundamental psychometric issues. For example, a better understanding of the long-term characteristics of MAYSI-2 scale scores would provide valuable data on the stability of symptoms being measured (i.e., whether the measure assesses state versus trait mental health concerns). In addition, a better understanding of the MAYSI-2 scale scores' relationship with recidivism might be used to inform treatment decisions. The current study addressed these issues by providing further data on the long-term characteristics of the MAYSI-2 scale scores, as well as the predictive validity of MAYSI-2 scale scores.

There were four primary objectives in the present study. The first objective was to examine the demographic characteristics of the current sample and provide data on the relationship of MAYSI-2 scale scores with each of the following variables: gender, race, suicide risk status, offense type, and recidivism. Previous literature has revealed meaningful differences in MAYSI-2 scores based on several demographic variables. For example, studies have shown that boys generally produced higher scores on several MAYSI-2 scales (e.g., Archer, Simonds, Spiegel, Handel, & Elkins, 2007; Grisso,

Barnum, et al., 2001; Nordness et al., 2002). Additionally, significant racial effects have been reported in other literature. Based on prior findings, it was hypothesized that boys in the current sample would produce higher mean MAYSI-2 scale scores than would girls. It was also hypothesized that White juveniles and juveniles who recidivate would produce higher mean scale scores. Finally, individuals identified as being at increased suicide risk were expected to produce higher scores on the Suicide Ideation scale.

The second objective for the current study was to examine the long-term stability of MAYSI-2 scale scores. Evaluation of this objective involved two sets of analyses. In the first set of analyses, test-retest correlations between MAYSI-2 scale scores were assessed and reliability characteristics were compared for juveniles with relatively longer versus shorter intervals between test administrations. For these analyses, correlational values were expected to decrease with greater time intervals between test administrations. To elaborate on results from test-retest correlational analyses, the study also examined changes in mean scale score elevations across time. It was hypothesized that results from these follow-up analyses would show meaningful changes in mean scale scores across successive test administrations. Further hypotheses related to the direction of change were not made, however, because no previous research has evaluated this study question.

The third goal of the current study was to add to preliminary research on the predictive utility of MAYSI-2 scale scores through evaluation of the relationship between MAYSI-2 scale scores and the number of detention admissions. Although one previous study (Marczyk, 2003) provides data on how scale scores predict recidivism among juvenile offenders, study findings were weak and were based on scales from the original MAYSI. Although previous research might suggest a relationship between MAYSI-2



scale scores and recidivism, the current study was exploratory in nature and offered no formal hypotheses on this issue.

Finally, to explore any possible connection of mental health symptoms with length of stay, analyses examined the relationship between MAYSI-2 scale scores and length of stay in the detention facility. Again, this hypothesis was exploratory and offered no formal hypotheses. Overall, the results of the current study should significantly extend our understanding of the reliability and validity of the MAYSI-2 scale scores in a large sample of adolescents in Virginia detention facilities.

## CHAPTER II

### METHOD

#### *Participants*

This study is based on archival records of juveniles adjudicated in the Commonwealth of Virginia between July 2004 and June 2005. The initial dataset includes a total of 9,756 adolescents admitted into 23 of Virginia's 25 detention facilities. For all participants, the MAYSI-2 was completed as part of a standard screening protocol during intake to the detention center. Within this sample of juveniles, variables available for analyses included MAYSI-2 scale scores, gender, race, suicide risk status (yes, no), offense information, days between MAYSI-2 administration and release from detention, and days between successive MAYSI-2 administrations. Age of participants was unavailable.

Before conducting analyses, data was cleaned for incomplete or invalid data. Data on adolescents missing all MAYSI-2 scores ( $n = 719$ ) or with unreported gender ( $n = 97$ ) were removed. Additionally, adolescent with apparent recording errors for other variables were removed from the dataset (e.g., hours between successive MAYSI-2 administrations was a negative value;  $n = 11$ ). The final sample of juvenile offenders used in the present study includes 8,929 adolescents (2,149 girls and 6,780 boys) who were admitted into one of the Virginia detention facilities and who completed the MAYSI-2.

Detained juveniles in the final sample were administered the MAYSI-2 from once to as many as nine times during the twelve month period (mean = 1.5; SD = 0.9). Table 4 provides data on the length of time between the MAYSI-2 administration and the individual's release from detention, which was used as a gross estimate of the detainee's

length of admission. It should be noted that there is some error in these data; although detention facilities administer the MAYSI-2 soon after the individual's entry into the detention facility, the exact time of MAYSI-2 administration may have ranged from several hours after being admitted to several days after being admitted. Thus, it is possible that, at least in some cases, these data underestimate the length of admission. With this qualification, data indicate that, on average, adolescents in the final sample were detained for approximately 21 days (median = 12; range = <1 day to 430 days).

Table 4

*Minimum, Maximum, and Mean Number of Days Between MAYSI-2 Administration and Release from Detention*

Administration No.	N	Min Days	Max Days	Mean Days (SD)	Median Days
1 <sup>st</sup>	8,929	<1	430	21 (32.3)	12
2 <sup>nd</sup>	2,752	<1	335	29 (38.6)	18
3 <sup>rd</sup>	944	<1	269	28 (33.0)	20
4 <sup>th</sup>	321	<1	293	31 (38.5)	20
5 <sup>th</sup>	103	<1	224	37 (48.2)	20
6 <sup>th</sup>	32	1	210	42 (54.7)	22
7 <sup>th</sup>	6	1	27	13 (10.0)	12
8 <sup>th</sup>	2	4	53	28 (33.9)	28
9 <sup>th</sup>	1	1	1	1 (0)	1

*Note.* All data were collected between July 2004 and June 2005. There was a minimum of one MAYSI-2 administration and a maximum of nine separate MAYSI-2 administrations for the sample.

Table 5 provides data on the length of time between any given MAYSI-2 administration and the juvenile's next MAYSI-2 administration. As can be seen, the length of time between the first and second MAYSI-2 administration ranged from several hours to 356 days (mean = 94 days; SD = 72.1 days). Time between the second and third MAYSI-2 administrations ranged from several hours to 315 days (mean = 73 days; SD = 56.3 days). Evident in these data is the wide variability in time between sequential MAYSI-2 administrations.

Table 5

*Minimum, Maximum, Mean, and Median Number of Days Between MAYSI-2 Administrations*

Administration No.	N	Min. Days	Max. Days	Mean Days (SD)	Median Days
1 <sup>st</sup> to 2 <sup>nd</sup>	2,752	<1	356	94 (72.1)	74
2 <sup>nd</sup> to 3 <sup>rd</sup>	944	<1	315	73 (56.3)	60
3 <sup>rd</sup> to 4 <sup>th</sup>	321	<1	281	62 (46.4)	50
4 <sup>th</sup> to 5 <sup>th</sup>	103	1	263	53 (42.5)	44
5 <sup>th</sup> to 6 <sup>th</sup>	32	1	139	40 (30.7)	31
6 <sup>th</sup> to 7 <sup>th</sup>	6	10	48	28 (13.8)	26
7 <sup>th</sup> to 8 <sup>th</sup>	2	43	89	65 (31.1)	65
8 <sup>th</sup> to 9 <sup>th</sup>	1	11	11	11 (0)	11

Complete demographic data for the total sample of 8,929 adolescents (6,780 boys; 2,149 girls) are provided in Table 6. As shown, the racial composition of the final sample included 4,482 (50.2%) African American adolescents, 3,683 (41.2%) White adolescents, and 568 (6.4%) Hispanic adolescents, with the remaining subjects falling into other or

unreported racial categories ( $n = 196$ ; 2.2%). Juveniles were assessed at intake for suicide risk by the detention facility's intake officer, and 7,762 (86.9%) of the total sample was determined not to be at risk, whereas 445 (5%) were classified as a suicide risk (the suicide risk of 722 adolescents was unknown or not reported). Legal charges for this sample of juvenile offenders included 3,217 (36.0%) Felony charges, 2,634 (29.5) charges related to violations of probation or parole and contempt of court or failure to appear, 2,555 (28.6) Class 1 Misdemeanors, 243 (2.7) Status Offenses, and 280 (3.1) juveniles with other violations. Although 5,805 (65%) juveniles were detained a single time, 3,123 (35%) were detained on two or more occasions, and 1,148 (13%) were detained on three or more occasions, indicating that slightly over one third of the sample were repeat offenders. Although no data were available for age of the current sample, for 2006 data on all juveniles detained in the Commonwealth of Virginia, age at admissions ranged from 8 to 20 years (Virginia Department of Juvenile Justice, 2006). Ninety-two percent of Virginia's juvenile detainees were between the ages of 14 and 17 years and 58.3% were between the ages 16 and 17 years; less than 1% were 18 or older, and less than 2% were 12 or younger.

Table 6 also includes comparisons of demographic characteristics of the sample based on gender. Several 2 x 2 chi-square analyses were conducted to evaluate gender effects. The phi-coefficient statistics was used to measure effect size. As shown in this table, although chi-square tests revealed significant gender effects on most of the demographic variables, phi-coefficient values revealed meaningful effect sizes only for the relationship of gender with a felony charge as well as violations of probation/parole and contempt of court/failure to appear. The odds ratio of being a male and committing a

Table 6

*Demographic Characteristics by Gender for Total Sample of 8,929 Adolescents on First Admissions to Detention*

	Frequencies (%)			$\chi^2$	$\Phi$
	Total Sample	Boys	Girls		
Total	8,929 (100)	6,780 (100)	2,149 (100)		
<b>Race</b>					
African American	4,482 (50.2)	3,513 (51.8)	969 (45.1)	29.5***	<b>.06</b>
White	3,683 (41.2)	2,714 (40.0)	969 (45.1)	17.3***	<b>.04</b>
Hispanic	568 (6.4)	410 (6.0)	158 (7.3)	4.7*	<b>.02</b>
Other/Unknown	196 (2.2)	134 (2.1)	53 (2.5)	<i>ns</i>	<b>.01</b>
<b>Suicide Risk Status</b>					
No	7,762 (86.9)	5,962 (87.9)	1,800 (83.8)	25.0***	<b>.05</b>
Yes	445 (5.0)	281 (4.1)	164 (7.6)	41.9***	<b>.07</b>
Unknown/Missing Data	722 (8.1)	537 (7.9)	185 (8.6)	<i>ns</i>	<b>.01</b>
<b>Legal Charge</b>					
Felonies	3,217 (36.0)	2,761 (40.7)	456 (21.2)	269.3***	<b>.17</b>
Violations of Probation/ Parole & Contempt of Court/Failure to Appear	2,634 (29.5)	1,814 (26.8)	820 (38.2)	102.0***	<b>.11</b>
Class 1 Misdemeanors	2,555 (28.6)	1,861 (27.4)	694 (32.2)	18.8***	<b>.05</b>
Status Offenses	243 (2.7)	140 (2.1)	103 (4.8)	45.9***	<b>.07</b>
Other Violations	280 (3.1)	204 (3.0)	76 (3.5)	<i>ns</i>	<b>.01</b>
<b>No. of Detention Admissions</b>					
Single Admission	5,805 (65.0)	4,327 (63.8)	1,478 (68.8)	17.6***	<b>.04</b>
Two or more Admissions	3,123 (35.0)	2,453 (36.2)	671 (31.2)	17.6***	<b>.04</b>
Three or more Admissions	1,148 (12.9)	896 (13.2)	252 (11.7)	<i>ns</i>	<b>.02</b>
<b>Subsequent Corrections Placement</b>					
No	7,738 (86.7)	5,699 (84.1)	2,039 (94.9)	154.4***	<b>.04</b>
Yes	1,191 (13.3)	1,081 (15.9)	110 (5.1)		

*Note.* Percentages in parentheses total 100% down each column for each demographic variable.  $\chi^2$ -values are based on gender frequency comparisons for selected demographic variables, including ethnicity, suicide risk, offense, reoffense status, and placement data.  $\Phi$ -values with at least a small effect size ( $\Phi \geq .10$ ) are presented in bold. *ns* not significant. \*  $p < .05$ . \*\*\*  $p < .001$ .

felony was 2.55 (i.e., males were 155% more likely to have committed a felony). The odds ratio of being female and committing a violation of probation/parole or contempt of court/failure to appear was 1.69 (i.e., females were 69% more likely to have committed a violation of probation/parole or contempt of court/failure to appear).

Presented in Table 7 are demographic characteristics of the sample based on race. A series of 2 x 4 chi-square tests were conducted, with associated phi-coefficient statistics, to compare frequencies. Racial background was significantly related to several of the demographic variables, including suicide risk status, legal charge, having three or more detention admissions, and subsequent placement in corrections. However, when effect size is taken into consideration, only small effects based on race were observed for unknown/missing suicide risk status, felony violations, and subsequent placement in corrections. Post hoc 2x2 chi-square comparisons of these effects revealed meaningful associations between being a White juvenile and having an unknown or missing suicide risk status ( $X^2 = 86.86$ ,  $p < .001$ ,  $\Phi = .10$ , odds ratio = 2.08), felony charges ( $X^2 = 80.96$ ,  $p < .001$ ,  $\Phi = .10$ , odds ratio = 0.66), and subsequent corrections placement ( $X^2 = 106.56$ ,  $p < .001$ ,  $\Phi = .11$ , odds ratio = .50). In other words, when compared with juveniles from other racial groups, White juveniles were 2.08 times (108%) more likely to have unknown or missing suicide risk statuses, 0.66 times (34%) less likely to be charged with a felony, and 0.5 times (50%) less likely to be subsequently placed in corrections. Meaningful associations were also found for African American juveniles with felony charges ( $X^2 = 99.45$ ,  $p < .001$ ,  $\Phi = .11$ , odds ratio = 1.56) and subsequent corrections placement ( $X^2 = 152.19$ ,  $p < .001$ ,  $\Phi = .13$ , odds ratio = 2.22). Specifically, when compared with juveniles from other racial groups, African American juveniles were 1.56

Table 7

*Demographic Characteristics by Race for Total Sample of 8,929 Adolescents on First Admissions to Detention*

	Frequencies (%)				$\chi^2$ -value	$\Phi$
	African American	White	Hispanic	Other/ Unknown		
Total	4,482 (100)	3,683 (100)	568 (100)	196 (100)		
Gender						
Boys	3,513 (78.4)	2,714 (73.7)	410 (72.2)	143 (73.0)		
Girls	969 (21.6)	969 (26.3)	158 (27.8)	53 (27.0)		
Suicide Risk Status						
No	3,974 (88.7)	3,085 (83.8)	528 (93.0)	175 (89.3)	63.5**	.08
Yes	244 (5.4)	182 (4.9)	8 (1.4)	11 (5.6)	17.5**	.04
Unknown/Missing Data	264 (5.9)	416 (11.3)	32 (5.6)	10 (5.1)	87.1**	.10
Legal Charge						
Felonies	1,841 (41.1)	1,126 (30.6)	189 (33.3)	61 (31.1)	101.0**	.11
Violations of Probation/ Parole & Contempt of Court/Failure to Appear	1,154 (25.7)	1,203 (32.7)	203 (35.7)	74 (37.8)	65.1**	.09
Class 1 Misdemeanors	1,281 (28.6)	1,075 (29.2)	146 (25.1)	53 (27.0)	<i>ns</i>	.02
Status Offenses	82 (1.8)	143 (3.9)	14 (2.5)	4 (2.0)	32.7**	.06
Other Violations	124 (2.8)	136 (3.7)	16 (2.8)	4 (2.0)	<i>ns</i>	.03
No. of Detention Admissions						
Single Admission	2,880 (64.3)	2,417 (65.6)	371 (65.3)	138 (70.4)	<i>ns</i>	.02
Two or more Admissions	1,602 (35.7)	1,266 (34.4)	197 (34.7)	58 (29.6)	<i>ns</i>	.02
Three or more Admissions	611 (13.6)	428 (11.6)	86 (15.1)	23 (11.7)	10.3*	.03
Subsequent Corrections Placement						
No	3,686 (82.2)	3,355 (91.1)	522 (91.9)	175 (89.3)	153.1**	.13
Yes	796 (17.8)	328 (8.9)	46 (8.1)	21 (10.7)		

*Note.* Percentages in parentheses total 100% down each column for each demographic variable.  $\chi^2$ -values are based on ethnicity frequency

comparisons for selected demographic variables, including suicide risk, offense, reoffense status, and placement data.  $\Phi$ -values with at least a small effect size ( $\Phi \geq .10$ ) are presented in bold.

*ns* not significant. \*  $p < .05$ . \*\*  $p < .01$ .



Table 8

*Demographic Characteristics of Sample for Subsequent Admissions to Detention*

	Frequency (%)					
	Boys			Girls		
	2 <sup>nd</sup> Admissions	3 <sup>rd</sup> Admissions	4 <sup>th</sup> Admissions	2 <sup>nd</sup> Admissions	3 <sup>rd</sup> Admissions	4 <sup>th</sup> Admissions
Total	2,150 (78.1)	733 (77.7)	210 (22.3)	602 (21.9)	210 (22.3)	250 (77.9)
Race						
African American	1,158 (53.9)	422 (57.6)	145 (58.0)	262 (43.5)	90 (42.9)	33 (46.5)
White	831 (38.7)	241 (32.9)	85 (34.0)	271 (45.0)	95 (45.2)	31 (43.7)
Hispanic	129 (6.0)	58 (7.9)	17 (6.8)	56 (9.3)	20 (9.5)	5 (7.0)
Other	32 (1.5)	12 (1.6)	3 (1.2)	13 (2.2)	5 (2.4)	2 (2.8)
Suicide Risk Status						
No	1,910 (88.8)	655 (89.4)	218 (87.2)	514 (85.4)	185 (88.1)	67 (49.4)
Yes	66 (3.1)	22 (3.0)	8 (3.2)	40 (6.6)	8 (3.8)	1 (1.4)
Unknown/Missing Data	174 (8.1)	56 (7.6)	24 (9.6)	48 (8.0)	17 (8.1)	3 (4.2)
Legal Charge						
Felonies	718 (33.4)	223 (30.4)	67 (26.8)	93 (15.4)	29 (13.8)	5 (7.0)
Violations of Probation/ Parole & Contempt of Court/Failure to Appear	878 (40.8)	320 (43.7)	137 (54.8)	319 (53.0)	128 (61.0)	43 (60.6)
Class 1 Misdemeanors	444 (20.7)	161 (22.0)	38 (15.2)	151 (25.1)	42 (20.0)	21 (29.6)
Status Offenses	26 (1.2)	8 (1.1)	1 (0.4)	12 (2.0)	1 (0.5)	0 (0)
Other Violations	84 (3.9)	21 (2.9)	7 (2.8)	27 (4.5)	10 (4.8)	2 (2.8)

*Note.* Percentages in parentheses total 100% down each column for each demographic variable, with the exception of the "Total" row, for which percentages in parentheses equal percent of total (100%).

times (56%) more likely to be charged with a felony and 2.22 times (122%) more likely to be subsequently placed in corrections. Table 8 extends data in Table 7 and shows demographic characteristics of juveniles administered the MAYSI-2 multiple times.

### *Instruments*

The Massachusetts Youth Screening Instrument-2 (MAYSI-2; Grisso & Barnum, 2001) is a 52-item self-report screening measure with a “yes” or “no” response format. It requires a fifth-grade reading level and was developed to evaluate recent or current symptoms of mental or emotional distress or disturbance. The MAYSI-2 provides scores on seven scales: Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, Somatic Complaints, Suicide Ideation, Thought Disturbance (scores only provided for boys), and Traumatic Experiences. Table 9 provides descriptive information about each scale, including a sample item, the range of possible scores, and cut-off score values.

Grisso and Barnum (2006) report reliability characteristics and internal consistency of the MAYSI-2 scale scores in the test manual. For the Massachusetts normative sample (Grisso, Barnum, et al., 2001), average corrected item-total correlations ranged from .37 to .63, suggesting adequate associations between items and their respective scales. Reported intercorrelations of the MAYSI-2 scales ranged from  $r = .24$  to  $r = .61$  (mean  $r = .39$  for boys,  $r = .41$  for girls) in the Massachusetts sample. Test-retest reliability coefficients were reported and ranged from  $r = .53$  to  $r = .89$ . Internal consistency alpha coefficients ranged from .61 to .86, with the exception of Traumatic Experiences (.51). Alpha coefficients were generally similar across racial groups, except for lower alpha coefficients on Suicide Ideation for Asian boys (when compared to other boys) and lower alpha coefficient values on Somatic Complaints for African-American

Table 9

*Description of the MAYSI-2 Scales*

Scale	Definition	Sample Item	Score Range	Caution Cut-Off	Warning Cut-Off
Alcohol/Drug Use	Drug or alcohol use that impairs daily functioning; possible drug dependence or abuse	“Have you used alcohol or drugs to make you feel better?”	0-8	4	6
Angry-Irritable	Experiences of frustration, moodiness and anger; risk of fighting and aggressive behavior	“When you have been mad, have you stayed mad for a long time?”	0-9	5	8
Depressed-Anxious	Depressed or anxious emotions; risk of depressive or anxiety disorders	“Have nervous or worried feelings kept you from doing things you want to do?”	0-9	3	6
Somatic Complaints	Somatic discomfort associated with distress; may be experiencing more psychological distress than is evident	“Have you had bad headaches?”	0-6	3	6
Suicide Ideation	Suicidal thoughts or plans; risk of self-injurious behavior or suicide attempts	“Have you felt like hurting yourself?”	0-5	2	3
Thought Disturbance (Boys Only)	Unusual perceptions/beliefs; possible thought disorder	“Have you heard voices other people can’t hear?”	0-5	1	2
Traumatic Experiences <sup>a</sup>	Lifetime exposure to traumatic events (e.g., abuse, sexual assault, violence); risk of PTSD	“Have you ever seen someone severely injured or killed in person—not in movies or on TV?”	0-5	N/A	N/A

*Note.* Adapted from Grisso, T., & Quinlan, J. C. (2005). Massachusetts Youth Screening Instrument—Version 2. In T. Grisso, G. Vincent, and D. Seagrave (Eds.), *Mental health screening and assessment in juvenile justice* (pp. 99-111). New York: Guilford Press.

<sup>a</sup>The authors do not provide cut-off recommendations for the Traumatic Experiences scale.

and Hispanic girls (when compared to White girls). Other independent studies have reported similar estimates of internal consistency (i.e., Archer et al., 2004; Hayes, McReynolds, & Wasserman, 2005).

### *Analyses*

#### *Preliminary Analyses*

Mean MAYSI-2 scale scores were computed for each administration occurrence based on gender to determine if differences existed between boys' and girls' MAYSI-2 scale scores. This would inform whether further analyses should be conducted separately for male and female juvenile offenders. A MANOVA was conducted with scores from the first administration of the MAYSI-2. In this analysis, gender served as the independent variable (boys versus girls) and scores from the six MAYSI-2 scales interpreted for both boys and girls served as the dependant variables (because Thought Disturbances is not scored for girls, it was not included in analyses). If the MANOVA was significant, it was followed by a series of one-way ANOVAs conducted separately for each of the MAYSI-2 scales and repeated on scores from the first four MAYSI-2 administrations. Again, gender served as the independent variable (boys versus girls) and each of the MAYSI-2 scale scores (except for Thought Disturbances) served as the dependent variables.

Further mean MAYSI-2 scale scores were calculated and compared for subsamples created by dividing the total sample according to race, legal charge, suicide risk status, repeat offender status, and detention facility. Separate MANOVAs were conducted with each of these demographic variables serving as independent variables and scores from the MAYSI-2 scales serving as the dependent variables. For each variable

that demonstrated a significant relationship with MAYSI-2 scale scores, separate one-way and factorial ANOVAs were conducted with each of the MAYSI-2 scale scores.

Where meaningful differences were observed among the independent variables with more than two levels (race, legal charge, and detention facility), appropriate post hoc analyses (Bonferroni) were conducted to further evaluate differences between levels of these variables.

#### *MAYSI-2 Test-Retest Comparisons*

Correlation coefficients for each of the MAYSI-2 scores were computed to evaluate the relationship between successive administrations of the test. Although the MAYSI-2 was administered to each participant between one and nine times, over 95% of participants completed the MAYSI-2 three or fewer times. Thus, correlation coefficients were only calculated between the first three MAYSI-2 administrations, for which the sample size was considered to be large enough for meaningful results. Mean r-values were then calculated for each scale.

Due to wide variability in the length of time between MAYSI-2 administrations (see Table 5), further analyses were conducted to compare mean scale correlation coefficients based on the time interval between MAYSI-2 administrations. A two-month cut point was selected because it most adequately divided the sample into two relatively equal groups (i.e., repeated MAYSI-2 administrations occurring within a two-month interval and repeated administrations occurring with more than a two-month interval). Thus, mean correlation coefficients were calculated for each scale when the first and second MAYSI-2 administrations were conducted within a two-month interval, and were compared with mean scale correlation coefficients from testing that occurred with greater

than two months between the first and second administration. This procedure was completed using the Fisher r-to-z transformation, which provides a z-value statistic and significance level. Estimates of effect size were based on calculating the change in  $r^2$ .

#### *MAYSI-2 Scale Scores Across Time*

In the first set of analyses addressing this study objective, each of the MAYSI-2 scale scores were measured at the first, second, and third administration point and mean comparisons were used to establish scale score changes across time. As in the above analyses, only the first three MAYSI-2 administration points were used in analyses to maintain adequate sample size for both male and female subsamples. A repeated measures MANOVA was first conducted to evaluate the overall effect of administration number on mean MAYSI-2 scale scores. For this analysis, administration number served as the independent variable (three levels: 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>) and each of the MAYSI-2 scales served as the dependent variables (six for boys and seven for girls). The MANOVA was followed by separate repeated measure ANOVAs (one for each of the MAYSI-2 scales). For each of the above analyses, both alpha significance level and effect size were examined to determine the statistical and clinical meaningfulness of observed differences. To determine differences in mean scale scores, appropriate post-hoc analyses were conducted for administration number.

To further evaluate observed changes in mean MAYSI-2 scale scores based on time, data were analyzed to better understand how these changes might affect whether juveniles meet the Caution and Warning cut-off scores, as defined by the MAYSI-2 manual (Grisso & Barnum, 2006). For these analyses, the percentage of subjects with scores equal to or greater than established cut-off scores were calculated for each

administration of the MAYSI-2. Then, the frequency at which adolescents remained in the same category (below or above cut-off scores) or moved to another category was calculated. For example, adolescents who were above MAYSI-2 cut-off scores for the first administration but not the second, or vice versa. These procedures were conducted for both Caution and Warning MAYSI-2 cut-off scores.

#### *MAYSI-2 Scale Score Predictive Utility for Identifying Repeat Offenders*

To evaluate the extent to which MAYSI-2 scale scores predict whether juveniles become repeat offenders, a binary logistic regression was used. Whether or not the juvenile detainee is a repeat offender served as the dependent variable on these analyses and each of the MAYSI-2 scale scores were entered as predictor variables. A forward stepwise logistic regression (with removal of variables based on maximized likelihood ratio) was conducted to explore which scale(s) best predict reoffender status. For this analysis, the Hosmer and Lemeshow goodness-of-fit test statistic also was calculated to test and confirm findings when applied in a replication subsample. Both analyses were conducted with scores from the first MAYSI-2 administration.

#### *The Relationship Between MAYSI-2 Scale Scores and Length of Stay*

To evaluate the relationship between mental health symptoms and length of stay, Pearson correlations were computed between scores from each of the MAYSI-2 scales and length of detainment in days.

## CHAPTER III

### RESULTS

#### *Preliminary Analyses*

The first set of analyses focused on exploring mean MAYSI-2 scale scores in the sample of adolescent detainees. A series of MANOVAs were conducted to evaluate differences in mean MAYSI-2 scale scores based on gender, race, offence, suicide risk status, repeat offender status, and detention facility. There was a significant mean difference between boys and girls on the combination of MAYSI-2 scales ( $F = 103.94, p < .001, \text{partial } \eta^2 = .07$ ). Further MANOVAs with the subsample of boys revealed a significant mean difference on the combination of the MAYSI-2 scales between racial categories ( $F = 33.20, p < .001, \text{partial } \eta^2 = .03$ ), offense categories ( $F = 5.46, p < .001, \text{partial } \eta^2 = .01$ ), suicide risk status ( $F = 21.65, p < .001, \text{partial } \eta^2 = .02$ ), repeat offender status ( $F = 9.54, p < .001, \text{partial } \eta^2 = .01$ ), and detention facility ( $F = 7.510, p < .001, \text{partial } \eta^2 = .02$ ). For girls, there was also a mean difference on the combination of the MAYSI-2 scales between racial categories ( $F = 13.36, p < .001, \text{partial } \eta^2 = .04$ ), offense categories ( $F = 2.92, p < .001, \text{partial } \eta^2 = .01$ ), suicide risk status ( $F = 19.62, p < .001, \text{partial } \eta^2 = .06$ ), repeat offender status ( $F = 5.10, p < .001, \text{partial } \eta^2 = .01$ ), and detention facility ( $F = 3.55, p < .001, \text{partial } \eta^2 = .04$ ). Univariate analyses were conducted to further examine mean scale score differences and are discussed below.

Table 10 presents data on mean MAYSI-2 scale scores based on gender and administration number. Mean MAYSI-2 scale score gender differences were analyzed using both t-test statistics and Cohen's D as a measure of effect size; however, interpretation focuses on effect size because of the large sample size in the current study,



Table 10

*Means and Standard Deviations for MAYSI-2 Scale Scores by Test Administration with Associated Gender Effects*

MAYSI-2 Scale	MAYSI-2 Scale Score			t-test	Cohen's D
	Mean (SD)				
	Total	Boys	Girls		
<u>1<sup>st</sup> Administration</u>					
	( <i>n</i> = 8,929)	( <i>n</i> = 6,780)	( <i>n</i> = 2,149)		
Alcohol/Drug Use	1.67 (2.2)	1.67 (2.2)	1.67 (2.2)	0.08	.00
Angry-Irritable	3.01 (2.7)	2.76 (2.6)	3.85 (2.7)	16.35**	.41
Depressed-Anxious	1.46 (1.8)	1.25 (1.7)	2.11 (2.1)	17.36**	.45
Somatic Complaints	1.90 (1.9)	1.70 (1.8)	2.54 (2.0)	17.44**	.44
Suicide Ideation	0.55 (1.2)	0.42 (1.1)	0.97 (1.6)	15.03**	.40
Thought Disturbance <sup>a</sup>	0.35 (0.7)	0.35 (0.7)	--	--	--
Traumatic Experiences	1.51 (1.5)	1.45 (1.4)	1.73 (1.5)	7.70**	.19
<u>2<sup>nd</sup> Administration</u>					
	( <i>n</i> = 2,752)	( <i>n</i> = 2,150)	( <i>n</i> = 602)		
Alcohol/Drug Use	1.86 (2.3)	1.87 (2.3)	1.83 (2.3)	0.31	.02
Angry-Irritable	2.68 (2.7)	2.46 (2.6)	3.48 (2.8)	7.96**	.38
Depressed-Anxious	1.26 (1.8)	1.11 (1.6)	1.80 (2.0)	7.66**	.38
Somatic Complaints	1.61 (1.8)	1.46 (1.8)	2.12 (2.0)	7.48**	.35
Suicide Ideation	0.45 (1.2)	0.35 (1.0)	0.82 (1.6)	7.07**	.35
Thought Disturbance <sup>a</sup>	0.28 (0.7)	0.28 (0.7)	--	--	--
Traumatic Experiences	1.36 (1.5)	1.26 (1.4)	1.73 (1.6)	6.44**	.31
<u>3<sup>rd</sup> Administration</u>					
	( <i>n</i> = 943)	( <i>n</i> = 733)	( <i>n</i> = 210)		
Alcohol/Drug Use	1.89 (2.4)	1.82 (2.4)	2.14 (2.5)	1.72	.13
Angry-Irritable	2.44 (2.6)	2.21 (2.5)	3.24 (2.8)	4.79**	.39
Depressed-Anxious	1.13 (1.7)	1.00 (1.6)	1.57 (2.0)	3.85**	.31
Somatic Complaints	1.39 (1.8)	1.24 (1.7)	1.94 (1.9)	4.77**	.39
Suicide Ideation	0.40 (1.1)	0.32 (1.0)	0.70 (1.4)	3.52**	.31
Thought Disturbance <sup>a</sup>	0.26 (0.7)	0.26 (0.7)	--	--	--
Traumatic Experiences	1.26 (1.5)	1.14 (1.4)	1.69 (1.6)	4.40**	.37

Table 10 (continued)

MAYSI-2 Scale	MAYSI-2 Scale Score Mean (SD)			t-test	Cohen's D
	Total	Boys	Girls		
	<u>4<sup>th</sup> Administration</u>				
	( <i>n</i> = 321)	( <i>n</i> = 250)	( <i>n</i> = 71)		
Alcohol/Drug Use	1.61 (2.2)	1.47 (2.1)	2.10 (2.4)	2.00	<b>.28</b>
Angry-Irritable	2.06 (2.4)	1.77 (2.3)	3.08 (2.6)	3.86**	<b>.53</b>
Depressed-Anxious	0.93 (1.5)	0.78 (1.4)	1.46 (1.8)	3.34**	<b>.42</b>
Somatic Complaints	1.21 (1.7)	1.05 (0.9)	1.76 (1.8)	3.25**	<b>.50</b>
Suicide Ideation	0.32 (1.0)	0.25 (0.9)	0.59 (1.4)	2.47*	<b>.29</b>
Thought Disturbance <sup>a</sup>	0.21 (0.6)	0.21 (0.6)	--	--	--
Traumatic Experiences	1.07 (1.4)	0.94 (1.3)	1.54 (1.6)	3.23**	<b>.41</b>

*Note.* Number in parentheses is sample size for group. T-test and Cohen's D values represent evaluations for gender differences. Bolded Cohen's D values represent at least a small effect size (>0.20).

<sup>a</sup> Scale only scored for boys.

*ns* not significant. \*  $p < .05$ . \*\*  $p < .01$ .

which artificially inflates tests based on statistical power. Recommendations set forth by Cohen (1988) were used to define small ( $d = .2$ ), medium ( $d = .5$ ), and large ( $d = .8$ ) effects. With the exception of the Alcohol/Drug Use scale, girls in the present sample consistently produced higher scores on MAYSI-2 scales for the first four administrations of the test. Gender effects were generally small to medium. Due to significant gender differences observed on MAYSI-2 scale scores as well as gender effects found among the demographic characteristics, all further analyses were conducted separately by gender.

Mean MAYSI-2 scale scores were also compared by racial group with a series of ANOVAs. These data are presented in Table 11. Again, due to the large sample size, interpretation was based on the effect size rather than significance test statistic (Cohen, 1988). For boys, meaningful differences in mean MAYSI-2 scale scores were produced

Table 11

## Mean and Standard Deviations for Scale Scores by Race

	MAYSI-2 Scale Score Mean (SD)				F-test	Partial $\eta^2$	Post Hoc Group Comparisons <sup>a</sup>
	African American (A)	White (W)	Hispanic (H)	Other/Unknown (O)			
<b>Boys</b>							
Alcohol/Drug Use	1.22 (1.8)	2.31 (2.5)	1.35 (2.0)	1.52 (2.0)	139.78***	<b>.06</b>	W>A,H,O
Angry-Irritable	2.56 (2.5)	3.12 (2.7)	2.11 (2.4)	2.73 (2.6)	33.15***	<b>.01</b>	W>A,H; A>H
Depressed-Anxious	1.14 (1.6)	1.39 (1.8)	1.21 (1.7)	1.45 (1.9)	11.98***	<b>.01</b>	W>A
Somatic Complaints	1.40 (1.6)	2.12 (1.9)	1.37 (1.6)	1.98 (1.9)	92.60***	<b>.04</b>	W>A,H; O>A,H
Suicide Ideation	0.31 (0.9)	0.57 (1.3)	0.40 (1.0)	0.46 (1.0)	31.73***	<b>.01</b>	W>A
Thought Disturbance	0.31 (0.7)	0.40 (0.8)	0.36 (0.8)	0.46 (1.0)	7.73***	.00	W>A
Traumatic Experiences	1.38 (1.4)	1.56 (1.4)	1.18 (1.4)	1.51 (1.6)	13.15***	<b>.01</b>	W>A,H
<b>Girls</b>							
Alcohol/Drug Use	1.10 (1.8)	2.26 (2.5)	1.59 (2.2)	1.58 (1.9)	47.66***	<b>.06</b>	W>A,H
Angry-Irritable	3.69 (2.7)	4.11 (2.8)	3.27 (2.6)	3.98 (2.7)	6.53***	<b>.01</b>	W>A,H
Depressed-Anxious	2.00 (2.1)	2.26 (2.1)	1.84 (1.9)	2.34 (2.1)	3.58*	<b>.01</b>	<i>ns</i>
Somatic Complaints	2.13 (1.9)	2.99 (2.0)	2.18 (1.9)	2.91 (2.1)	33.35***	<b>.05</b>	W>A,H
Suicide Ideation	0.78 (1.4)	1.17 (1.7)	0.92 (1.6)	0.94 (1.5)	10.13***	<b>.01</b>	W>A
Thought Disturbance	--	--	--	--	--	--	--
Traumatic Experiences	1.54 (1.5)	1.97 (1.6)	1.41 (1.4)	2.00 (1.6)	16.12***	<b>.02</b>	W>A,H

Note. For boys, sample sizes were as follows: 3,513 African American, 2,714 White, 410 Hispanic, 134 other/unknown. For girls, sample sizes were as follows: 969 African American, 969 White, 158 Hispanic, 53 other/unknown. Bolded partial eta<sup>2</sup> ( $\eta^2$ ) values represent at least a small effect size (>.01).

<sup>a</sup> significant at  $p < .05$ .

*ns* not significant. \*  $p < .05$ . \*\*\*  $p < .001$ .

on all scales except Thought Disturbances. Bonferroni post hoc comparisons showed that White boys in the present sample produce significantly higher scores than did African American boys on each of these scales. White boys also produced significantly higher scores than did Hispanic boys on Alcohol/Drug Use, Angry-Irritable, and Traumatic Experiences. African American boys produced significantly higher scores than did Hispanic boys on the Angry-Irritable scale. Among the sample of girls, White adolescents produced significantly higher scores than did African American adolescents and Hispanic adolescents on the Alcohol/Drug Use, Angry-Irritable, Somatic Complaints, and Traumatic Experiences scales. White girls produced significantly higher scores than did African American girls but not Hispanic girls on the Suicide Ideation scale.

Table 12 presents mean MAYSI-2 scale scores based on offense category. As shown in Table 12, the only scale with meaningful differences in mean scale scores based on offense committed was Alcohol/Drug Use. Post-hoc group comparisons revealed that boys charged with violations of probation/parole or contempt of court/failure to appear produced higher scores on the Alcohol/Drug Use scale than did boys charged with a felony or a misdemeanor. For girls, there were meaningful scale score differences on Angry-Irritable, Depressed-Anxious, Somatic Complaints, and Suicide Ideation. More specifically, as compared to girls charged with violations of probation/parole or contempt of court/failure to appear, girls charged with a misdemeanor produced significantly higher scores on the Angry-Irritable and Suicide Ideation scales. As compared to girls charged with violation of probation/parole or contempt of court/failure to appear, girls charged with a status offense produced significantly higher scores on the Depressed-Anxious and Somatic Complaints scales.

Table 12

*Mean and Standard Deviations for Scale Scores by Offense Committed*

	MAYSI-2 Scale Score Mean (SD)						F-test	$\eta^2$	Post Hoc Group Comparisons <sup>b</sup>
	Class 1			Status					
	Felonies (F)	Violations <sup>a</sup> (V)	Misdemeanors (M)	Offenses (S)	Other (O)				
<b>Boys</b>									
Alcohol/Drug Use	1.49 (2.1)	1.91 (2.2)	1.66 (2.2)	1.58 (2.1)	2.27 (2.4)	14.44***	.01	V>F,M; O>F,M,S	
Angry-Irritable	2.63 (2.5)	2.71 (2.5)	3.00 (2.6)	3.04 (2.7)	3.04 (2.7)	6.77***	.00	M>F,V	
Depressed-Anxious	1.25 (1.7)	1.17 (1.6)	1.31 (1.7)	1.44 (2.0)	1.24 (1.7)	<i>ns</i>	.00		
Somatic Complaints	1.71 (1.7)	1.64 (1.8)	1.70 (1.8)	2.09 (1.9)	1.67 (1.8)	<i>ns</i>	.00		
Suicide Ideation	0.43 (1.1)	0.36 (1.0)	0.47 (1.2)	0.54 (1.2)	0.38 (1.0)	3.38*	.00	F>V	
Thought Disturbance	0.37 (0.7)	0.30 (0.7)	0.37 (0.8)	0.39 (0.8)	0.39 (0.8)	<i>ns</i>	.00		
Traumatic Experiences	1.48 (1.4)	1.39 (1.5)	1.44 (1.4)	1.44 (1.4)	1.48 (1.4)	<i>ns</i>	.00		
<b>Girls</b>									
Alcohol/ Drug Use	1.63 (2.3)	1.78 (2.2)	1.49 (2.1)	1.78 (2.2)	2.14 (2.4)	2.67*	.00	<i>ns</i>	
Angry-Irritable	3.80 (2.7)	3.61 (2.8)	4.12 (2.7)	3.89 (2.6)	4.29 (2.9)	3.80*	.01	M>V	
Depressed-Anxious	2.14 (2.1)	1.96 (2.0)	2.16 (2.1)	2.63 (2.4)	2.41 (2.2)	3.10*	.01	S>V	
Somatic Complaints	2.56 (1.9)	2.43 (2.0)	2.57 (2.0)	3.09 (2.1)	2.67 (2.1)	2.71*	.01	S>V	
Suicide Ideation	1.05 (1.6)	0.81 (1.5)	1.07 (1.6)	1.06 (1.5)	1.11 (1.7)	3.42*	.01	M>V	
Thought Disturbance	--	--	--	--	--	--	--	--	
Traumatic Experiences	1.79 (1.6)	1.71 (1.6)	1.67 (1.5)	1.86 (1.6)	2.08 (1.4)	<i>ns</i>	.00		

*Note.* For boys, sample sizes were as follows: 2,761 Felonies, 1,814 Violations, 1,861 Class 1 Misdemeanors, 140 Status Offenses, and 204 Other Offenses. For girls, sample sizes were as follows: 456 Felonies, 820 Violations, 694 Class 1 Misdemeanors, 103 Status offenses, and 76 Other Offenses. Bolded  $\eta^2$  ( $\eta^2$ ) values represent at least a small effect size (>.01).

<sup>a</sup> *Violations* are violations of probation/parole and contempt of court or failure to appear. <sup>b</sup> significant at  $p < .05$ . *ns* not significant. \*  $p < .05$ . \*\*\*  $p < .001$ .

Table 13

*Means and Standard Deviations for MAYSI-2 Scale Scores by Suicide Risk Status with Associated Statistical Tests*

	MAYSI-2 Scale Score		F-test	$\eta^2$
	Mean (SD)			
	Suicide Risk: Yes	Suicide Risk: No		
<b>Boys</b>				
Alcohol/Drug Use	2.23 (2.4)	1.62 (2.2)	21.22***	.00
Angry-Irritable	3.94 (2.7)	2.66 (2.5)	67.07***	<b>.01</b>
Depressed-Anxious	2.23 (2.2)	1.20 (1.6)	102.31***	<b>.02</b>
Somatic Complaints	2.29 (1.8)	1.64 (1.8)	36.27***	<b>.01</b>
Suicide Ideation	1.12 (1.6)	0.39 (1.0)	127.51***	<b>.02</b>
Thought Disturbance	0.64 (1.0)	0.34 (0.7)	44.26***	<b>.01</b>
Traumatic Experiences	1.95 (1.5)	1.42 (1.4)	37.27***	<b>.01</b>
<b>Girls</b>				
Alcohol/Drug Use	1.79 (2.2)	1.65 (2.2)	<i>ns</i>	.00
Angry-Irritable	4.95 (2.5)	3.70 (2.7)	32.23***	<b>.02</b>
Depressed-Anxious	3.32 (2.4)	1.98 (2.0)	64.59***	<b>.03</b>
Somatic Complaints	3.27 (1.9)	2.41 (2.0)	28.57***	<b>.01</b>
Suicide Ideation	2.09 (1.9)	0.85 (1.5)	100.69***	<b>.05</b>
Thought Disturbance	--	--	--	--
Traumatic Experiences	2.27 (1.7)	1.67 (1.5)	23.36***	<b>.01</b>

*Note.* For boys, sample sizes were 281 yes and 5,962 no. For girls, sample sizes were 164 yes and 1,800 no. Bolded  $\eta^2$  ( $\eta^2$ ) values represent at least a small effect size (>.01).

\*\*\*  $p < 0.001$  level.

Finally, Table 13 shows mean MAYSI-2 scale scores related to suicide risk status. Both male and female juveniles placed on suicide risk status produced higher scores on all scales except Alcohol/Drug Use. Scores were especially discrepant on the Suicide Ideation and Depressed-Anxious scales.

The next set of preliminary analyses focused on examining mean MAYSI-2 scale scores of juveniles who were and were not repeat offenders (presently defined as juveniles who were readmitted into a detention or corrections facility during the twelve-

Table 14

*Mean and Standard Deviations of MAYSI-2 Scale Scores for Single and Repeat Offenders by Gender*

	Mean (SD) MAYSI-2 Score		F-test	$\eta^2$
	Single Offender	Repeat Offender		
<b>Boys</b>				
Alcohol/Drug Use	1.54 (2.1)	1.91 (2.3)	47.36***	<b>.01</b>
Angry-Irritable	2.68 (2.5)	2.90 (2.6)	11.44***	.00
Depressed-Anxious	1.25 (1.7)	1.24 (1.7)	<i>ns</i>	.00
Somatic Complaints	1.71 (1.8)	1.68 (1.8)	<i>ns</i>	.00
Suicide Ideation	0.42 (1.1)	0.43 (1.1)	<i>ns</i>	.00
Thought Disturbance	0.35 (0.7)	0.34 (0.8)	<i>ns</i>	.00
Traumatic Experiences	1.44 (1.4)	1.46 (1.5)	<i>ns</i>	.00
<b>Girls</b>				
Alcohol/Drug Use	1.56 (2.1)	1.91 (2.3)	11.57***	<b>.01</b>
Angry-Irritable	3.77 (2.7)	4.04 (2.8)	4.8*	.00
Depressed-Anxious	2.13 (2.1)	2.06 (2.0)	<i>ns</i>	.00
Somatic Complaints	2.59 (2.0)	2.43 (2.0)	<i>ns</i>	.00
Suicide Ideation	0.97 (1.6)	0.96 (1.6)	<i>ns</i>	.00
Thought Disturbance	--	--	--	--
Traumatic Experiences	1.70 (1.5)	1.81 (1.6)	<i>ns</i>	.00

Note. For boys, sample sizes were 4,327 for single offenders and 2,453 for repeat offenders. For girls, sample sizes were 1,478 for single offenders and 671 for repeat offenders. Bolded  $\eta^2$  ( $\eta^2$ ) values represent at least a small effect size (>.01).

\*  $p < 0.05$  level. \*\*\*  $p < 0.001$  level.

month period of data collection). Table 14 compares mean MAYSI-2 scale scores based on whether or not the juvenile was a repeat offender. As can be seen, there were significant differences in scale scores for Alcohol/Drug Use and Angry-Irritable scale scores; however, only differences in scores on the Alcohol/Drug Use scale resulted in at least a small effect (i.e.,  $\eta^2 < .01$ ). Boys and girls who had been placed in detentions on

more than one occasion during the 12-month follow-up produced higher scores on the Alcohol/Drug Use scale than did boys and girls for whom this was their only detainment.

Finally, a set of ANOVAs was conducted to evaluate differences in each MAYSI-2 scale scores based on detention facility. The current study involved data from 23 different detention facilities in the Commonwealth of Virginia, and as reported above, a MANOVA revealed a significant mean difference between detention facilities on the combination of all MAYSI-2 scale scores. Thus, a set of follow-up one-way ANOVAs was conducted with each MAYSI-2 scale. Among both boys and girls, significant differences in mean scale scores based on detention facility were found for all seven MAYSI-2 scales. For boys, the ANOVA results are as follows: Alcohol/Drug Use  $F = 16.40, p < .001, \text{partial } \eta^2 = .05$ , Angry-Irritable  $F = 12.30, p < .001, \text{partial } \eta^2 = .04$ , Depressed-Anxious  $F = 13.06, p < .001, \text{partial } \eta^2 = .04$ , Somatic Complaints  $F = 18.50, p < .001, \text{partial } \eta^2 = .06$ , Suicide Ideation  $F = 12.15, p < .001, \text{partial } \eta^2 = .03$ , Thoughts Disturbance  $F = 7.64, p < .001, \text{partial } \eta^2 = .02$ , and Traumatic Experiences  $F = 13.54, p < .001, \text{partial } \eta^2 = .04$ . For girls, the ANOVA results are as follows: Alcohol/Drug Use  $F = 6.32, p < .001, \text{partial } \eta^2 = .06$ , Angry-Irritable  $F = 4.06, p < .001, \text{partial } \eta^2 = .04$ , Depressed-Anxious  $F = 4.96, p < .001, \text{partial } \eta^2 = .05$ , Somatic Complaints  $F = 9.71, p < .001, \text{partial } \eta^2 = .09$ , Suicide Ideation  $F = 5.21, p < .001, \text{partial } \eta^2 = .05$ , and Traumatic Experiences  $F = 3.23, p < .001, \text{partial } \eta^2 = .03$ . Importantly, although all results were significant, for most scales, the effect was small (i.e.,  $\eta^2 < .01$ ). Only one scale for boys (Somatic Complaints) and two scales for girls (Alcohol/Drug Use and Somatic Complaints) reached the magnitude of a medium effect size.



### *MAYSI-2 Test-Retest Comparisons*

Correlational data from repeat MAYSI-2 administrations are presented in Table 15. Correlation coefficients were computed separately by gender for each scale. Data for boys are presented below the diagonal line and data for girls are presented above the diagonal line. For the Alcohol/Drug Use scale, the mean correlation was  $r = .58$  for boys and  $r = .66$  for girls. For the Angry-Irritable scale, the mean correlation was  $r = .42$  for boys and  $r = .49$  for girls. For the Depressed-Anxious scale, the mean correlation was  $r = .46$  for boys and  $r = .54$  for girls. For the Somatic Complaints scale, the mean correlation was  $r = .47$  for boys and  $r = .57$  for girls. For the Suicide Ideation scale, the mean correlation was  $r = .47$  for boys and  $r = .39$  for girls. For the Thought Disturbance scale, the mean correlation was  $r = .34$  for boys (not scored for girls). Finally, for the Traumatic Experiences scale, the mean correlation was  $r = .48$  for boys and  $r = .53$  for girls.

Correlations between the first and second MAYSI-2 administration were then separated into two subgroups based on repeat administrations that were conducted with less than, and more than, 60 days between tests. The mean correlation coefficients were compared separately for boys and girls. These data are presented in Table 16. Due to the large sample size, differences in effect size ( $r$ -values) were also computed. Small (.01), medium (.06), and large (.14) effects were based on Cohen's (1988) suggested benchmarks. Correlational values were consistently larger for the shorter time interval (< 60 days), among both boys and girls.

### *MAYSI-2 Scale Scores Across Time*

Table 17 shows results from repeated measures ANOVAs comparing mean MAYSI-2 scale scores across the first three test administrations for boys and girls. These

Table 15

*MAYSI-2 Scale Score Administration Correlations for Boys and Girls*

MAYSI-2 Administration No.	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
<u>Alcohol/Drug Use</u>				
1 <sup>st</sup>	--	.73**	.67**	.40**
2 <sup>nd</sup>	.63**	--	.70**	.43**
3 <sup>rd</sup>	.53**	.69**	--	.72**
4 <sup>th</sup>	.42**	.56**	.66**	--
<u>Angry-Irritable</u>				
1 <sup>st</sup>	--	.64**	.50**	.29*
2 <sup>nd</sup>	.59**	--	.57**	.45**
3 <sup>rd</sup>	.43**	.59**	--	.66**
4 <sup>th</sup>	.32**	.47**	.56**	--
<u>Depressed-Anxious</u>				
1 <sup>st</sup>	--	.63**	.44**	.30*
2 <sup>nd</sup>	.52**	--	.52**	.48**
3 <sup>rd</sup>	.42**	.61**	--	.76**
4 <sup>th</sup>	.38**	.49**	.59**	--
<u>Somatic Complaints</u>				
1 <sup>st</sup>	--	.62**	.52**	.45**
2 <sup>nd</sup>	.52**	--	.55**	.48**
3 <sup>rd</sup>	.41**	.60**	--	.66**
4 <sup>th</sup>	.34**	.51**	.60**	--
<u>Suicide Ideation</u>				
1 <sup>st</sup>	--	.53**	.41**	.20
2 <sup>nd</sup>	.47**	--	.49**	.46**
3 <sup>rd</sup>	.45**	.55**	--	.54**
4 <sup>th</sup>	.34**	.59**	.68**	--
<u>Thought Disturbance</u>				
1 <sup>st</sup>	--	--	--	--
2 <sup>nd</sup>	.44**	--	--	--
3 <sup>rd</sup>	.34**	.42**	--	--
4 <sup>th</sup>	.14*	.10	.54**	--
<u>Traumatic Experiences</u>				
1 <sup>st</sup>	--	.62**	.46**	.47**
2 <sup>nd</sup>	.55**	--	.69**	.56**
3 <sup>rd</sup>	.42**	.63**	--	.69**
4 <sup>th</sup>	.30**	.47**	.52**	--

*Note.* Data for females are presented above diagonal lines; data for males are presented below diagonal lines. For boys, the sample sizes are: 2,150 for correlations with the 2<sup>nd</sup> MAYSI-2 administration, 733 for correlations with the 3<sup>rd</sup> administration, and 250 for correlations with the 4<sup>th</sup> administration. For girls, the sample sizes are: 602 for correlations with the 2<sup>nd</sup> MAYSI-2 administration, 210 for correlations with the 3<sup>rd</sup> administration, and 71 for correlations with the 4<sup>th</sup> administration.

<sup>a</sup> Traumatic Thought Disturbance scale is not interpretable for girls.

\*  $p < 0.05$  level (2-tailed). \*\*  $p < 0.01$  level (2-tailed).

Table 16

*Correlations Between the First and Second MAYSI-2 Administrations Based on Time Interval Between Administrations*

	< 60 Days	> 60 Days	z-value	$r^2\Delta$
<b>Boys</b>				
Alcohol/Drug Use	.70	.59	4.07***	<b>-.13</b>
Angry-Irritable	.61	.57	1.37	-.05
Depressed-Anxious	.56	.50	2.02*	<b>-.07</b>
Somatic Complaints	.57	.49	2.45*	<b>-.08</b>
Suicide Ideation	.50	.44	1.87	<b>-.06</b>
Thought Disturbance	.42	.46	1.02	.04
Traumatic Experiences	.58	.53	1.55	<b>-.06</b>
<b>Girls</b>				
Alcohol/Drug Use	.78	.69	2.56***	<b>-.14</b>
Angry-Irritable	.72	.58	3.09**	<b>-.19</b>
Depressed-Anxious	.66	.61	1.01	<b>-.06</b>
Somatic Complaints	.67	.58	1.76	<b>-.11</b>
Suicide Ideation	.61	.46	2.53*	<b>-.16</b>
Thought Disturbance <sup>a</sup>	--	--	--	--
Traumatic Experiences	.63	.60	0.47	<b>-.03</b>

*Note.* For boys, the sample size was 891 for the group who was re-administered the MAYSI-2 within 60 days and 1,259 for the group re-administered the MAYSI-2 in more than 60 days. For girls, the sample size was 278 for the group who was re-administered the MAYSI-2 within 60 days and 324 for the group re-administered the MAYSI-2 in more than 60 days. Bolded  $r^2\Delta$  values represent at least a medium effect size change ( $r^2\Delta > .06$ ).

<sup>a</sup> Traumatic Thought Disturbance scale is not interpretable for girls.

\*  $p < 0.05$  level (2-tailed). \*\*  $p < 0.01$  level (2-tailed). \*\*\*  $p < 0.001$  level (2-tailed).

data are also shown separately for boys and girls (see Figure 3). For these analyses, because the assumption of sphericity was violated, the Greenhouse-Geisser test statistics was interpreted and is presented in Table 17. For post-hoc comparisons, the Bonferroni test statistic was used. As can be seen in this table, there were no significant differences in mean MAYSI-2 scale scores for Alcohol/Drug Use among either gender group. For the Angry-Irritable scale, there were reliable mean scale score changes based on

administration number for boys as well as for girls. For the Depressed-Anxious scale, there were reliable mean scale scores changes based on time for boys as well as for girls. Reliable mean scale score changes based on administration number were also observed of the Somatic Complaints scale for boys as well as for girls. For the Suicide Ideation scale, there were no significant changes in mean scale score for boys, but there were for girls. The sample of boys did not produce meaningful differences in mean Thought Disturbance scale scores based on time. Finally, for the Traumatic Experiences scale, while there were no meaningful changes in mean scale scores for the girls, there were for the boys. As shown in Table 17, when reliable differences in mean MAYSI-2 scale scores were observed based on administration number, the first administration was generally the highest score.

Frequency data on boys and girls in the current sample who met or exceeded Caution and Warning cut-off MAYSI-2 scale scores for the first four administrations are presented in Table 18. This data is graphically presented in Figure 4. Overall, among the boys, approximately 31% to 56% met the Caution cut-off and 12% to 22% met the Warning cut-off for at least one of the MAYSI-2 scales. Among the girls, approximately 41% to 69% met the Caution cut-off and 20% to 27% met the Warning cut-off for at least one of the MAYSI-2 scales.

Table 19 compares the first and second MAYSI-2 administrations to identify how frequently boys' and girls' scale scores change in terms of meeting the criteria for Caution and Warning cut-off points. For example, if they met the Caution cut-off on the first administration, do they also meet the cut-off scores during their second administration? As shown in this table, approximately 75% to 95% of boys' and girls'

Table 17

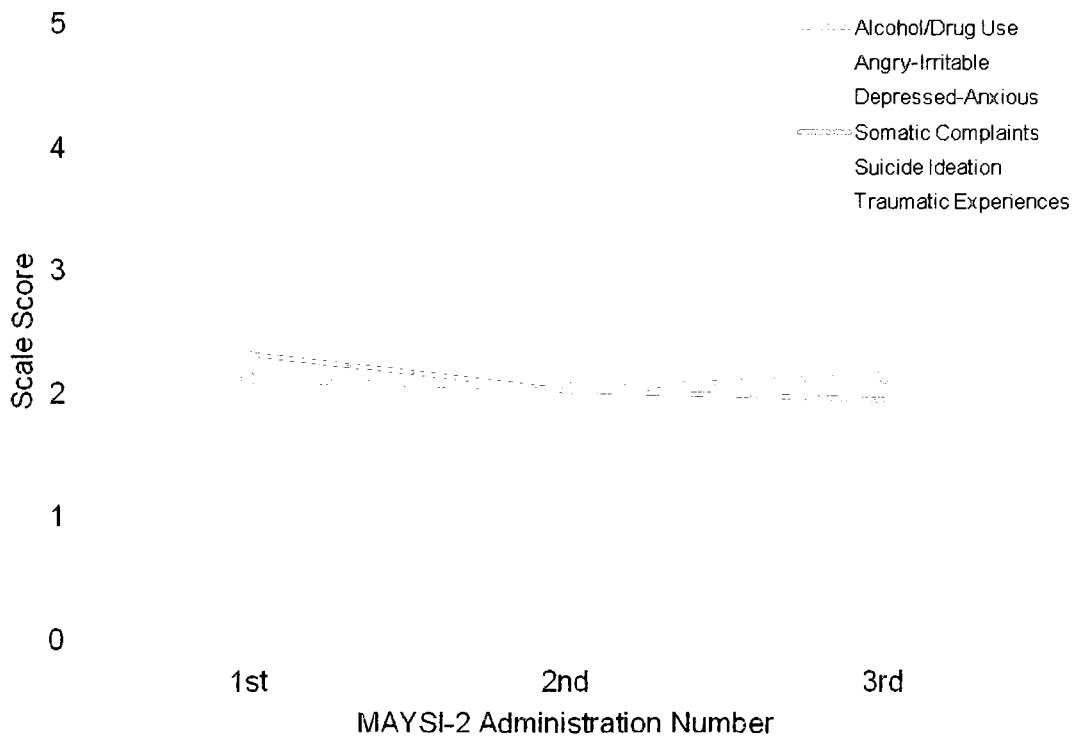
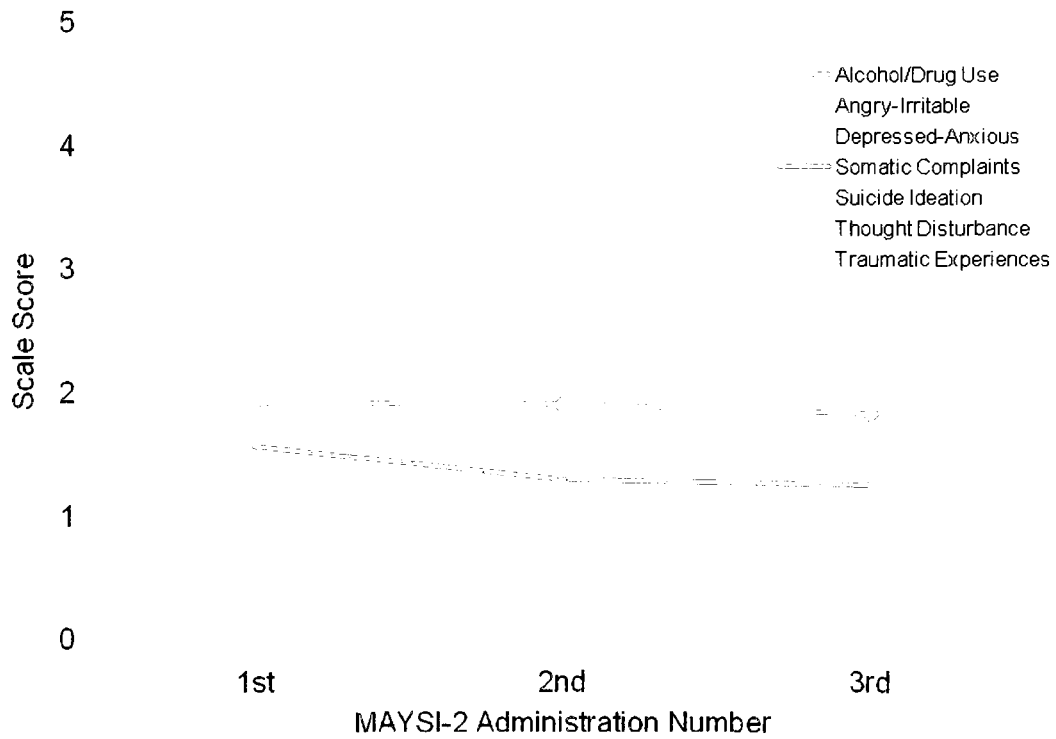
## Repeated Measures ANOVA Comparisons of MAYSI-2 Mean Scale Score Between Administrations

	1 <sup>st</sup> Mean (SD)	2 <sup>nd</sup> Mean (SD)	3 <sup>rd</sup> Mean (SD)	F-test	Partial $\eta^2$	Post-hoc Comparisons <sup>a</sup>
<b>Boys<sup>b</sup></b>						
Alcohol/Drug Use	1.92 (2.2)	1.89 (2.4)	1.82 (2.4)	<i>ns</i>	.00	
Angry-Irritable	2.88 (2.6)	2.48 (2.5)	2.21 (2.5)	27.19***	<b>.04</b>	1>2,3; 2>3
Depressed-Anxious	1.16 (1.6)	1.04 (1.6)	1.00 (1.6)	3.77*	<b>.01</b>	1>3
Somatic Complaints	1.56 (1.7)	1.28 (1.7)	1.24 (1.7)	15.11***	<b>.02</b>	1>2,3
Suicide Ideation	0.39 (1.0)	0.32 (1.0)	0.32 (1.0)	<i>ns</i>	.00	
Thought Disturbance	0.31 (0.7)	0.25 (0.7)	0.26 (0.7)	<i>ns</i>	.00	
Traumatic Experiences	1.37 (1.4)	1.21 (1.4)	1.14 (1.4)	10.61***	<b>.01</b>	1>2,3
<b>Girls<sup>c</sup></b>						
Alcohol/Drug Use	2.11 (2.4)	2.03 (2.4)	2.14 (2.5)	<i>ns</i>	.00	
Angry-Irritable	4.10 (2.8)	3.37 (2.8)	3.24 (2.8)	13.43***	<b>.06</b>	1>2,3
Depressed-Anxious	2.03 (1.9)	1.71 (2.1)	1.57 (2.0)	5.12**	<b>.03</b>	1>3
Somatic Complaints	2.32 (2.0)	2.01 (2.0)	1.94 (1.9)	5.04**	<b>.02</b>	1>2,3
Suicide Ideation	1.00 (1.6)	0.80 (1.5)	0.70 (1.4)	3.95*	<b>.02</b>	1>3
Thought Disturbance	--	--	--	--	--	
Traumatic Experiences	1.81 (1.5)	1.73 (1.6)	1.69 (1.6)	<i>ns</i>	.00	

Note. Bolded partial eta<sup>2</sup> ( $\eta^2$ ) values represent at least a small effect size (>.01).

<sup>a</sup> significant at  $p < .05$ . <sup>b</sup>  $n = 733$ . <sup>c</sup>  $n = 210$ .

*ns* not significant. \*  $p < 0.05$  level. \*\*  $p < 0.01$  level. \*\*\*  $p < 0.001$  level.



**Figure 3.** Mean MAYSI-2 scale scores between first through third administrations for boys and girls. Data for boys is presented in the top figure and data for girls is presented in the bottom figure.

Table 18

*Frequency of Juveniles Meeting Caution and Warning Cut-Offs<sup>a</sup>*

MAYSI-2 Scale	Boys (%) <sup>b</sup>			Girls (%) <sup>c</sup>		
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Alcohol/Drug Use						
Caution (4)	189 (25.8)	187 (25.5)	174 (23.7)	58 (27.6)	54 (25.7)	60 (28.6)
Warning (6)	67 (9.1)	90 (12.3)	85 (11.6)	31 (14.8)	30 (14.3)	35 (16.7)
Angry-Irritable						
Caution (5)	202 (27.6)	164 (22.4)	142 (19.4)	98 (46.7)	70 (33.3)	63 (30.0)
Warning (8)	42 (5.7)	32 (4.4)	36 (4.9)	31 (14.8)	21 (10.0)	22 (10.5)
Depressed-Anxious						
Caution (3)	123 (16.8)	108 (14.8)	118 (16.1)	77 (37.7)	53 (25.2)	47 (22.4)
Warning (6)	16 (2.2)	18 (2.5)	20 (2.7)	15 (7.1)	17 (8.1)	16 (7.6)
Somatic Complaints						
Caution (3)	200 (27.3)	160 (21.9)	160 (21.9)	88 (41.9)	76 (36.2)	69 (32.9)
Warning (6)	17 (2.3)	24 (3.3)	18 (2.5)	15 (7.1)	14 (6.7)	16 (7.6)
Suicide Ideation						
Caution (2)	68 (9.2)	50 (6.8)	56 (7.6)	54 (25.7)	34 (16.2)	33 (25.7)
Warning (3)	45 (6.1)	37 (5.0)	41 (5.6)	40 (19.0)	32 (15.2)	26 (12.4)
Thought Disturbance						
Caution (1)	158 (21.5)	125 (17.1)	119 (16.2)	--	--	--
Warning (2)	45 (6.1)	35 (4.8)	45 (6.1)	--	--	--
At least one MAYSI-2 scale						
Caution	409 (55.8)	365 (49.8)	328 (44.7)	147 (70.0)	123 (58.6)	117 (55.7)
Warning	158 (21.6)	156 (21.3)	147 (20.1)	75 (35.7)	65 (31.0)	64 (30.5)

*Note.* Number in parenthesis after scale's Caution and Warning equals the required scale raw score to meet cut-offs.

<sup>a</sup>Caution and Warning groups may overlap. <sup>b</sup>  $n = 733$ . <sup>c</sup>  $n = 210$ .

Table 19

*Frequency of MAYSI-2 Scale Score Changes Based on Cut-Off Criteria and Exact Change<sup>a</sup>*

Gender/Scale	Frequency (%) Meeting Caution Cut-Off				Frequency (%) Meeting Warning Cut-Off				
	1 <sup>st</sup> No		1 <sup>st</sup> Yes		1 <sup>st</sup> No		1 <sup>st</sup> Yes		
	2 <sup>nd</sup> No	2 <sup>nd</sup> Yes	2 <sup>nd</sup> No	2 <sup>nd</sup> Yes	2 <sup>nd</sup> No	2 <sup>nd</sup> Yes	2 <sup>nd</sup> No	2 <sup>nd</sup> Yes	
<b>Boys<sup>b</sup></b>									
Alcohol/ Drug Use	1,424 (66.2)	198 (9.2)	189 (8.8)	339 (15.8)	1793 (83.4)	136 (6.3)	105 (4.9)	116 (5.4)	
Angry-Irritable	1,364 (63.4)	163 (7.6)	286 (13.3)	337 (15.7)	1,958 (91.1)	77 (3.6)	80 (3.7)	35 (1.6)	
Depressed-Anxious	1,598 (74.3)	158 (7.3)	200 (9.3)	194 (9.0)	2,042 (95.0)	47 (2.2)	40 (1.9)	21 (1.0)	
Somatic Complaints	1,309 (60.9)	218 (10.1)	296 (13.8)	327 (15.2)	2,011 (93.5)	58 (2.7)	57 (2.7)	24 (1.1)	
Suicide Ideation	1,837 (85.5)	93 (4.3)	134 (6.2)	85 (4.0)	1,941 (90.3)	60 (2.8)	92 (4.3)	56 (2.6)	
Thought Disturbance	1,470 (68.4)	184 (8.6)	260 (12.1)	234 (10.9)	1,940 (90.3)	63 (2.9)	96 (4.5)	49 (2.3)	
At least one MAYSI-2 scale	725 (33.7)	196 (9.1)	433 (20.1)	796 (37.0)	1,463 (68.0)	178 (8.3)	247 (11.5)	262 (12.2)	
<b>Girls<sup>c</sup></b>									
Alcohol/ Drug Use	402 (66.8)	44 (7.3)	54 (9.0)	102 (16.9)	497 (82.6)	33 (5.5)	35 (5.8)	37 (6.1)	
Angry-Irritable	275 (45.7)	43 (7.1)	102 (16.9)	182 (30.2)	492 (81.7)	27 (4.5)	53 (8.8)	30 (5.0)	
Depressed-Anxious	343 (57.0)	49 (8.1)	76 (12.6)	134 (22.3)	536 (89.0)	18 (2.0)	28 (4.7)	20 (3.3)	
Somatic Complaints	274 (45.5)	48 (8.0)	97 (16.1)	183 (30.4)	528 (87.7)	26 (4.3)	28 (4.7)	20 (3.3)	
Suicide Ideation	416 (69.1)	39 (6.5)	73 (12.1)	74 (12.3)	457 (75.9)	38 (6.3)	54 (9.0)	53 (8.8)	
Thought Disturbance	--	--	--	--	--	--	--	--	
At least one MAYSI-2 scale	148 (24.6)	28 (4.7)	148 (24.6)	278 (46.2)	350 (58.1)	51 (8.5)	90 (15.0)	111 (18.4)	

<sup>a</sup> Cut-Off scores are not used for the Traumatic Experiences scale. <sup>b</sup> n = 2,150. <sup>c</sup> n = 602.



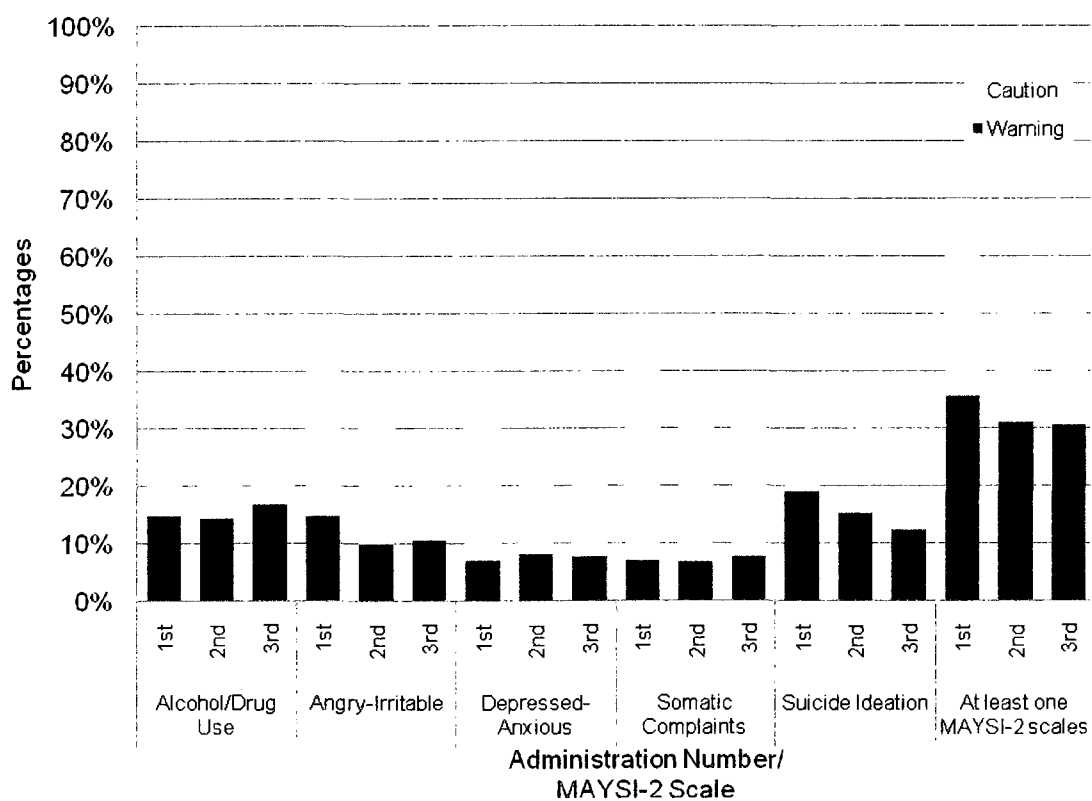
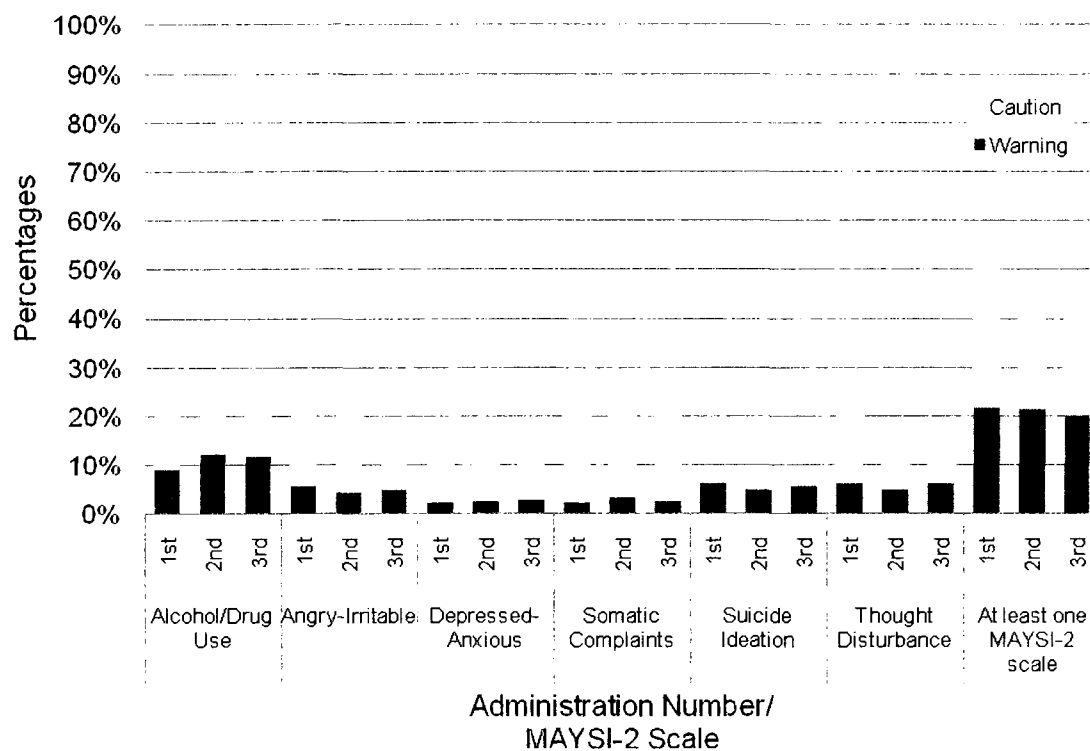


Figure 4. Proportion of female juveniles meeting MAYSI-2 caution and warning cut-off scores. Data for boys is presented in the top figure and data for girls is presented in the bottom figure

scale scores remain consistent in terms of meetings (yes-yes) or not meeting (no-no) Caution or Warning cut-off scores.

*MAYSI-2 Scale Score Predictive Utility for Identifying Repeat Offenders*

Results from logistical regression analyses with boys and girls are presented in Table 20. Results yielded four significant predictors for boys (Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, and Somatic Complaints) and three significant predictors for girls (Alcohol/Drug Use, Angry-Irritable, and Somatic Complaints). However, classification was unimpressive. Specifically, for boys the overall correct classification was 63.9% (model  $\chi^2(4, 6,776) = 63.10, p < .001$ , Cox and Snell  $R^2 = .01$ ; Hosmer and Lemeshow goodness-of-fit test  $\chi^2(8, 6,776) = 16.04, p = .04$ ). Among one-time offending boys, 99.3% (4,299/29+4,299) were correctly classified (specificity), while 0.9% (21/21+2,427) of repeat offenders were correctly classified (sensitivity). Positive predictive power (PPP) for boys was 42.0% (21/21+29) and negative predictive power (NPP) was 63.9% (4,299/4,299+2,427). For girls, the overall correct classification was 68.8% (model  $\chi^2(3, 2,149) = 25.27, p < .001$ , Cox and Snell  $R^2 = .01$ ; Hosmer and Lemeshow goodness-of-fit test  $\chi^2(8, 2,149) = 13.67, p = .09$ ). Of female one-time offenders, 100% (1,478/0+1,478) were correctly classified (specificity), while 0% (0/0+671) of repeat offenders was correctly classified (sensitivity). Positive predictive power (PPP) for girls was 0% and negative predictive power (NPP) was 68.8% (1,478/1,478+671). For both males and females, the Alcohol/Drug Use MAYSI-2 scale was the strongest predictors of recidivism. Given that the odds ratio was 1.08 for both boys and girls, juveniles were 8% more likely to have recidivated during the 12-month

Table 20

*Logistic Regression Predicting Repeat Offense within 12-Month Follow-Up*

Predictor Variable	B	SE	Wald	Odds Ratio
<b>Boys</b>				
Alcohol/Drug Use	0.08	0.01	40.49***	1.08
Angry-Irritable	0.04	0.01	9.02**	1.04
Depressed-Anxious	-0.05	0.02	5.60*	0.95
Somatic Complaints	-0.04	0.20	5.38*	0.96
<b>Girls</b>				
Alcohol/Drug Use	0.07	0.02	10.23***	1.08
Angry-Irritable	0.05	0.02	5.79*	1.05
Somatic Complaints	-0.10	0.03	12.91***	0.91

Note. For boys, sample size was 6,780. For girls, sample size was 2,149. For boys, overall correct classification = 63.9%. For girls, overall correct classification = 68.8%.

\*  $p < 0.05$  level. \*\*  $p < 0.01$  level. \*\*\*  $p < 0.001$  level.

follow-up period with every one unit increase in their score on the Alcohol/Drug Use MAYSI-2 scale.

*The Relationship Between MAYSI-2 Scale Scores and Length of Stay*

In the final set of analyses, the relationship between mean MAYSI-2 scale scores and length of detainment was analyzed with Pearson correlations. These data are presented in Table 21. Overall, results were inconsistent across MAYSI-2 administrations and few meaningful relationships were present. Due to the overall lack of relationship between these two variables, no further analyses were conducted.

Table 21

*Correlations Between MAYSI-2 Scale Scores and Length of Detention in Days*

Gender/Scales	1 <sup>st</sup> Admission	2 <sup>nd</sup> Admission	3 <sup>rd</sup> Admission	4 <sup>th</sup> Admission
<b>Boys</b>				
Alcohol/Drug Use	.05	.02	.06	-.08
Angry-Irritable	-.01	.05	.02	.03
Depressed-Anxious	.02	.07	.03	.01
Somatic Complaints	-.03	.03	.01	-.00
Suicide Ideation	.01	.03	.01	.08
Thought Disturbance	.02	.06	.09	<b>.12</b>
Traumatic Experience	.03	.02	.02	.07
<b>Girls</b>				
Alcohol/Drug Use	<b>.12</b>	.05	.01	-.08
Angry-Irritable	.06	.04	<b>.14</b>	-.05
Depressed-Anxious	.04	.08	.05	.07
Somatic Complaints	-.02	<b>.10</b>	.02	.00
Suicide Ideation	.04	.05	<b>.15</b>	<b>.22</b>
Thought Disturbance <sup>a</sup>	--	--	--	--
Traumatic Experience	.07	.05	<b>.15</b>	<b>-.13</b>

Note. For boys, sample size was 6,769 for the first admission, 2,147 for the second admission, 733 for the third admission, and 250 for the fourth admission. For girls, sample size was 2,149 for the first admission, 602 for the second admission, 210 for the third admission, and 71 for the fourth admission. Correlation coefficients (r-values) presented in bold represent a small effect ( $r \geq .10$ ).

<sup>a</sup>Thought Disturbance is not scored for girls.

## CHAPTER IV

### DISCUSSION

The current study was conducted with four primary objectives in mind: 1.) to examine differences in mean MAYSI-2 scale scores based on demographic variables; 2.) to evaluate MAYSI-2 scale score stability; 3.) to determine if MAYSI-2 scale scores predict recidivism; and, 4.) to explore the relationship between MAYSI-2 scale scores and length of stay. Data for the present study were obtained from official records of a large sample of juveniles admitted to one of the 23 detention facilities in the Commonwealth of Virginia between July 2004 and June 2005. Before evaluating the primary study objectives, sample characteristics were examined to better evaluate the generalizability of findings. The Virginia Department of Juvenile Justice reported that there were 17,087 new detention admissions for fiscal year 2005 (VDJJ, 2006). Thus, this sample represents over 50% of all new admissions in Virginia during this period. Gender and racial composition of the current sample are similar to that of the overall detention population (VDJJ, 2006). Thus, research findings would be expected to generalize to other detained juveniles in the Commonwealth of Virginia. Data from the current study are also generally comparable with data from the MAYSI-2 normative sample. More specifically, in comparison with the total sample collected for the national normative study of the MAYSI-2 (Grisso & Barnum, 2006), the current dataset included an equal ratio of males to females. There were, however, fewer Hispanic juveniles and more African American juveniles in the current sample than in the national norms. If present data are compared only to the sample of detained juveniles from the normative data (rather than the total normative sample), gender and racial breakdown are roughly equal.

Within the current data, there were few differences between male and female detainees based on demographic characteristics (i.e., race, suicide risk status, legal charge, repeat offender status). However, boys were 155% more likely than girls to be charged with a felony, and girls were 69% more likely than boys to face charges related to violations of the collapsed category of probation/parole or contempt of court/failure to appear. In all other ways, boys and girls in the current sample were comparable. These findings related to differences in legal charges are consistent with other data showing that male juveniles are generally charged with more serious offenses than are female juveniles (e.g., Snyder & Sickmund, 2006).

Race was meaningfully related to several demographic variables. Specifically, White juveniles were 108% more likely than other racial groups to have unknown or missing suicide risk status, 34% less likely to have been charged with a felony offense, and 50% less likely to have been subsequently placed in corrections. Conversely, African American juveniles were 56% more likely than other racial groups to have been charged with a felony and 122% more likely to have been subsequently placed in corrections. Racial bias in the U.S. legal system has been the focus of much discussion in recent years (e.g., Pope, Lovell, & Hsia, 2002; Snyder & Sickmund, 2006). Whereas African American youth account for approximately 16% of the overall juvenile population, they account for 27% of all juvenile arrests in the U.S. (Snyder & Sickmund, 2006). In a recent literature review on racial biases in the juvenile justice system, Pope, Lovell, and Hsia offered the following conclusion (2002, pp 5):

The majority of the studies reviewed (25 out of 34) report race effects in the processing of youth. Eight studies reported direct or indirect effects, and 17 studies revealed mixed results (i.e., race effects were present at

some decision points yet not present at others, or race effects were apparent for certain types of offenders or certain offenses but not for others). ...The preponderance of the research over three decades documents evidence of racial disparities, at least at some stages within the juvenile justice system.... However, the causes and mechanisms of these disparities are complex. Important contributing factors may include inherent system bias, effects of local policies and practices, and social conditions (such as inequality, family situation, or underemployment) that may place youth at risk. Further, overrepresentation may result from the interaction of factors. Also, the most significant factors may vary by jurisdiction.

Current data also provide evidence of racial disparities in Virginia. Based on 2000 Census data, African American individuals accounted for 23% of the total juvenile population in the state of Virginia (U.S. Census Bureau). However, in the current study, African Americans accounted for 50% of all detainees, 57% of juveniles charged with a felony, and 67% of juveniles who were subsequently placed in corrections.

#### *MAYSI-2 scale scores and demographics*

Juveniles in the current sample reported relatively few mental health symptoms measured by the MAYSI-2 scales. On average, juveniles reported between zero and three symptoms in each content area measured by the MAYSI-2 scales, and scale scores were generally slightly lower than what has been reported in other MAYSI-2 research (e.g., Archer et al., 2004; Butler, Loney, & Kistner, 2007; Cauffman, 2004; Grisso & Barnum, 2001, 2006). Nonetheless, on first administration of the MAYSI-2, approximately 56% of boys and 70% of girls met Caution or Warning cut-off scores for at least one of the MAYSI-2 scales. These rates of reported mental health symptoms are consistent with previous research suggesting that approximately two out of three juvenile offenders meet minimum DSM-IV diagnostic criteria for at least one psychiatric disorder (e.g., Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2002). Not surprisingly, given the

behavioral disturbance exhibited by the population, in the current study scores on the Angry-Irritable scale were generally the most elevated among the MAYSI-2 scales.

Females in the current sample consistently reported more mental health symptoms on all scales except Alcohol/Drug Use. This finding has been common among MAYSI-2 research (e.g., Archer et al., 2004; Butler, Loney, & Kistner, 2007; Cauffman, 2004; Grisso & Barnum, 2001, 2006) as well as psychiatric prevalence studies (e.g., Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2002). There was also a trend for White juveniles (boys and girls) to report more symptoms, particularly on the Alcohol/Drug Use and Somatic Complaints MAYSI-2 scales. This trend has also been documented in prior research (e.g., Teplin et al., 2002).

Suicide is the leading cause of death for juveniles in custody (Snyder & Sickmund, 2006). Thus, one very important function of the screening instruments used in the juvenile justice system is the identification of youths who might be at risk of harming themselves. The MAYSI-2 appears to be an adequate tool for accomplishing this goal. In the current study, boys and girls who were determined to be a suicide risk produced higher scores on all MAYSI-2 scales except Alcohol/Drug Use. However, the largest effects for mean scale score differences were observed for the Suicide Ideation and Depressed-Anxious scales. These findings add to previous literature lending support for the usefulness of the Suicide Ideation scale in identifying juvenile offender who might be at risk of harming themselves (e.g., Archer et al., 2004; Butler, Loney, & Kistner, 2007; Grisso & Barnum, 2001, 2006; Wasserman et al., 2004).



*MAYSI-2 scale score stability*

A primary area of focus for the current study was the effect of repeated MAYSI-2 administrations on scale scores. An important factor for examining the psychometric properties and interpretability of any test of psychological functioning is its stability. Often measured through test-retest correlation coefficients and defined as test-retest reliability, the stability of scale scores provides valuable information about the degree to which scores can be expected to remain constant across time and situation. Higher reliability estimates (e.g., test-retest correlational values) are often assumed to be preferable to lower correlational values. However, this may not always be the case. Rather than being viewed as poor reliability, test-retest correlations that are smaller in magnitude may suggest that the symptom or attribute is susceptible or sensitive to change. Measures that evaluate psychological traits (e.g., personality) should demonstrate little change over time, while measures that evaluate psychological states (e.g., current emotions) may demonstrate greater variability across time. Understanding the degree to which a measured attribute can be expected to change is important for determining how much to generalize an individual's results across time and setting. For example, if a detainee receives an elevated score on the Depressed-Anxious MAYSI-2 scale, this might suggest the presence of global, internalizing emotions, it might be a reflection of their current situational response (e.g., legal charges, removal from home, relational conflict), or a mixture of both.

To examine scale score stability in the current sample, a number of procedures were followed. First, test-retest correlations were calculated. Results showed that correlations between MAYSI-2 administrations varied based on scale and test

administration number. Overall, mean test-retest scale correlations ranged from  $r = .34$  to  $r = .66$ . When individual correlational pairs were compared, the trend was to decrease in magnitude as the number of test administrations increased. For example, in the female subsample, mean Alcohol/Drug Use scale score correlations between the first and second MAYSI-2 administrations were  $r = .73$ . This correlational value dropped to  $r = .67$  between the first and third administrations, and  $r = .40$  between the first and fourth administrations.

When the sample was split into two groups, based on length of time between the first and second MAYSI-2 administrations, correlational values were substantially lower for longer time intervals ( $> 60$  days) than for shorter intervals ( $< 60$  days). Although current findings are similar to data reported in other studies involving the MAYSI-2 (e.g., Cauffman, 2004; Grisso & Barnum, 2001), MAYSI-2 test-retest stability appears to be weaker than that of other measures used to assess psychiatric symptoms among adolescents. For example, test-retest coefficients reported for the MMPI-A scale scores in a non-delinquent sample (Butcher et al., 1992) range from  $r = .62$  to  $r = .84$ . Although there is moderate consistency of scores across MAYSI-2 administrations, data would suggest that the mental health characteristics measured by the MAYSI-2 are less stable across time than are scale scores from other measures of psychiatric functioning, especially with longer time intervals between test administrations. In particular, symptoms measured by the Thought Disturbance and Suicide Ideation scales appear to be most subject to variability in scores. Alternatively, test-retest correlations are strongest for the Alcohol/Drug Use scale; though values drop substantially after 60 days. Although somewhat higher test-retest reliability estimates are provided in the MAYSI-2 manual,

this is consistent with the test author's assertion that the MAYSI-2 scales measure mental states rather than psychiatric diagnoses or longstanding psychological states (Grisso & Barnum, 2006).

After establishing that scale scores on the MAYSI-2 lack strong stability, the current study sought to better understand how scores change across time. When changes in mean scale scores were analyzed across test administrations, scores on several MAYSI-2 scales were found to decrease across time. Scales showing decreasing scores included the Angry-Irritable, Depressed-Anxious, and Somatic Complaints scales for boys and girls, as well as the Suicide Ideation scale for girls and the Traumatic Experiences scale for boys. Although mean comparison procedures offer valuable information about the statistical significance of findings, a more clinical approach was also desired. Because important decisions regarding treatment and placement needs of juvenile detainees are often based on whether they reach Caution and Warning cut-off points, examining the clinical significance of scale score changes allow for a better understanding of how changes in scores might affect case management. Thus, the frequency of juvenile detainees who met MAYSI-2 cut-off criteria on each test administration were examined for changes in whether they remained below or above these cut-points on the second test administration. Overall, the majority of juveniles who scored below cut-off scores during their first MAYSI-2 administration also scored below cut-offs during their second test administration (61% to 86% for boys; 46% to 69% for girls). However, approximately 10% (Suicide Ideation) to 24% (Somatic Complaints) of boys and 16% (Alcohol/Drug Abuse) to 24% (Angry-Irritable) of girls went from below cut-off criterion on their first administration to above cut-off scores on their second

administration, or vice versa. When changes in cut-off classification were present, there tended to be reductions in the proportion of boys and girls meeting, or exceeding, caution and warning cut-offs across time.

Reaching a better understanding of what might account for these changes is an important area for future research to explore. Grisso and Barnum (2001) examined test-retest scores for two administrations of the MAYSI-2 and found that, for boys only, scores were significantly lower during the second administration on the Depressed-Anxious, Somatic Complaints, and Thought Disturbance scales. In a similar analysis of MAYSI-2 scale scores, Cauffman (2004) reported a trend for scores to decrease on all scales but Alcohol/Drug Use and Suicide Ideation. Beyond the current study, there is no published data examining stability of MAYSI-2 scores across more than two administrations.

There are several possible explanations for the observed reductions in MAYSI-2 scale scores. One explanation is that this pattern of decreasing mental health symptoms is related to age. When Cauffman (2004) compared MAYSI-2 scale scores for four different age groups, scores were significantly higher for younger boys and girls on the Angry-Irritable scale. However, scale scores were found to increase with age on the Alcohol/Drug Use and Traumatic Experiences scales. Using the DISC 2.3, Teplin et al. (2002) found that the prevalence of substance use disorders increases with age for both male and female juvenile offenders, oppositional defiant disorder decreased with age for girls, and generalized anxiety disorder increased with age for boys. Clearly, there is an effect of age on mental health functioning. However, results have been relatively inconsistent.

Changes in MAYSI-2 test scores might also relate to changes in environment or life situation. For example, the individual might have identified alternative means for dealing with emotional distress. They might also have learned to cope better with less than ideal home or community environments. Indeed, they may have grown more comfortable across time and experience with being arrested and placed in detention. Finally, a more optimistic explanation is that reduced reports of mental health symptoms might be related to effective treatment of psychiatric disorder among juvenile repeat offenders. Approximately 97% of residential facilities for delinquent youth provide onsite substance abuse education and approximately 69% provide onsite individual therapy by a substance abuse professional (Snyder & Sickmund, 2006). The available resources for juvenile offenders may be leading to small but meaningful gains in psychological functioning.

#### *Predictive utility of MAYSI-2 scale scores*

Among the 2.2 million juveniles arrested in 2003, approximately half will have been rearrested within one year, and one in three will have been readjudicated within one year (Snyder & Sickmund, 2006). Because these youth cost society several millions of dollars each year (e.g., Cohen, 1998), factors associated with an increased probability of reoffending have been studied widely. Younger age at first offense has consistently been associated with an increased risk of recidivism (e.g., Cottle, Lee, & Heilbrun, 2001; Katsiyannis, Zhang, Barrett, & Flaska, 2004; Walters, 1996), but countless other risk factors have also been suggested (e.g., gender, IQ, severity of crime, race, mental health, number of prior arrests, substance abuse, peer relations). Relevant for the current study, several psychiatric variables also have been suggested. For example, in a recent meta-

analysis (Cottle, Lee, & Heilbrun, 2001), less severe forms of psychopathology, conduct problems, substance abuse, and sexual or physical abuse history were reported to be significant predictors of recidivism among juvenile offenders. In contrast, severe psychopathology (e.g., psychosis, suicidality), psychiatric treatment history, and substance use were not found to be significantly related to recidivism. To date, only one study has evaluated the role scale scores from the MAYSI might play in predicting juvenile recidivism (Marczyk et al., 2003). The authors of this study reported that recidivism was related to higher scores on the Suicide Ideation, Angry/Irritable, Fighting, and Anxiety scales, and to lower scales on the Alcohol/Drug Use, Somatic Complaints, Thought Disturbance, and Traumatic Experiences scales (results are based on scale scores from the original MAYSI, which has since been modified).

Similar to data from other sources, approximately 35% of juvenile detainees from the current sample recidivated during the 12-month follow-up (recidivism in the current study was measured by repeat admissions to detention). When mean scale scores were compared for single offenders versus repeat offenders, the only scale with meaningful differences was the Alcohol/Drug Use scale, for which repeat offenders produced higher scores than single offenders. When logistical regressions were performed, for boys, higher scores on the Alcohol/Drug Use and Angry-Irritable scales were significantly related to recidivism, as were lower scores on the Depressed-Anxious and Somatic Complaints scales. For girls, higher scores on the Alcohol/Drug Use and Angry-Irritable scales were related to recidivism, as were lower scores on the Somatic Complaints scale. Although each of these relationships was significant, these scales demonstrated very limited predictive power, and made correct classifications that were only slightly better

than chance (approximately two thirds were correctly classified). Overall, Alcohol/Drug Use appears to be the best MAYSI-2 predictor of juvenile recidivism. Other research has also found this strong association. For example, one study found that juvenile offenders who self-reported frequent drug and alcohol use were at a 70% greater risk of recidivism and juvenile offenders whose parents report that they frequently use drugs and alcohol were at a 114% greater risk of recidivism, when compared with juveniles who deny substance use (Stoolmiller & Blechman, 2005).

#### *MAYSI-2 scale scores and length of stay*

Information on the length of residential placement among juvenile offenders is an important component of understanding the juvenile justice system's handling of cases (Snyder & Sickmond, 2006). The national median length of stay for juvenile detainees is 15 days. Length of stay has been shown to relate to offense and gender (Snyder & Sickmond, 2006). The current study examined the relationship of length of stay with mental health symptoms measured by the MAYSI-2. In the present study, the median length of stay was 12 days (mean = 21 days) for the total sample. Length of stay did not consistently correlate with MAYSI-2 scale scores. Thus, no further evaluation of this relationship was conducted. Although it is possible that future research will find a relationship between these variables, current data did not support this hypothesis.

#### *Limitations*

There are important limitations to consider when interpreting results from the present study. First, although characteristic of data reported by other researchers, the range of scores on the MAYSI-2 scales was relatively limited. On average, few symptoms from the MAYSI-2 scales were endorsed and the majority of scale scores fell

below cut-off values. Thus, limited range of scores may have weakened statistical findings.

Second, as in other studies on juvenile delinquency, the current sample included far fewer female juvenile offenders than male juvenile offenders. It is important to continue to examine the relationship between gender, juvenile delinquency, and mental health concerns. As data indicates, symptom presentations are very different for boys and girls. Male and female juveniles are not affected by psychiatric illness at equal rates, they do not demonstrate equal patterns of offending, and they likely have different placement and treatment needs. The proportion of female juveniles involved in criminal activity is increasing at a disproportional rate to male juveniles (Snyder & Sickmund, 2006) and it is imperative that they not be ignored in research on juvenile crime.

Third, the current sample was racially skewed. Although the racial composition of present data is similar to that of most studies evaluating characteristics of juvenile offender populations, the largest proportion of the sample was African American. A very small percentage of the sample was Hispanic, Asian, or from another minority group. The racial composition was also very different from that of the general juvenile population.

Fourth, in the current sample, because the dataset was archival, data was limited to what was made available by the Commonwealth of Virginia's DJJ. Thus, certain potentially important demographic variables were unavailable. In particular, ages of detainees were not included in data and could only be estimated based on population characteristics. Additionally, although the present sample represents over half of all juvenile intakes to one of Virginia's detention facilities, data on the remaining juveniles from the population was unavailable. Thus, we were unable to determine whether there



might be important differences between the cases that were included in present analyses and those not included.

Finally, data are limited to detained juveniles in the Commonwealth of Virginia. Future research will need to cross-validate study findings with samples from other geographic regions and juvenile justice settings. Additionally, given the exploratory nature of several of the study objectives, results should be independently replicated to confirm findings.

## CHAPTER V

### CONCLUSIONS

Overall, study findings lend support to the notion that demographic characteristics must be considered when evaluating mental health concerns. MAYSI-2 scale scores are likely to vary based on gender, race, and offense history. When interpreting results from the MAYSI-2, it will be important for detention officers and mental health professionals to consider how scores might be affected by these differences. For example, should facilities employ global cut-off scores for all intake cases, there is likely to be significant differences in the proportion of males and females or African American and White juveniles identified as needing further evaluation or additional services (Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001). Future research should carefully evaluate possible gender and racial bias by examining whether these demographic variables affect the validity of MAYSI-2 scale scores. Due to significant gender and racial disparities observed in the processing of juvenile offender cases, facility administrators are advised to carefully consider how best to handle differences in MAYSI-2 outcomes. Although mean scale score differences could be a function of measurement error, research also suggests that psychiatric disorder prevalence rates may vary by gender and racial groups (e.g., Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2005). Of note, differences in prevalence rates could reflect true differences in the diagnosis of psychiatric disorder, or, as many researchers have suggested, this pattern could reflect a tendency for females to be more prone towards reporting psychiatric symptoms.

Mean MAYSI-2 scale scores also varied by detention facility. Although one would expect to find significant differences across jurisdictions (i.e., in different states),

the significant differences in mental health complaints made by juveniles administered the MAYSI-2 in each of the 23 detention facilities in the Commonwealth of Virginia is compelling. Future research should better evaluate these differences. Specifically, data on what might account for these differences could help improve policies as well as mental health treatment within the juvenile justice system. For example, one future study could be to conduct a survey of the various treatment options available for adolescents admitted to each of the Virginia detention facilities.

Another important finding from the current study is the instability of scale scores across administrations of the MAYSI-2. Although substance abuse scale scores appear to be relatively stable over time, all other areas of mental health functioning measured by the MAYSI-2 appear to fluctuate for males, females, or both. Identification of the source of these changes is an essential area for future research to explore. Specifically, researchers will need to address what factors might account for changes in MAYSI-2 scale scores (e.g., changes within the individual, changes in their environment, or various sources of measurement or test error). Grisso and Barnum (2003) suggest that MAYSI-2 scales measure state characteristics that might be expected to be less stable at longer test-retest intervals. Current evidence supports this conclusion, indicating that MAYSI-2 scale scores tend to measure features of mental health functioning that are based on state or environmentally responsive factors, rather than trait characteristics of the individual. Until more is known about how and why MAYSI-2 scale scores change, as well as how more general mental health symptoms change in juvenile offenders, decisions about the needs of repeat juvenile offenders appear to be more accurately evaluated based on current data rather than background material. Current findings support recommendations

by Archer (2005) that, due to the fluid nature of adolescent emotional and psychological functioning, assessment data should not be used to make long-term predictions of adolescent behaviors and symptomatology.

Because data on recidivism risk is important for determining policy and the appropriate treatment of juvenile offenders, accurate identification of variables that lead to an increased risk of future criminal activity is essential. The lack of evidence provided by present analyses on the predictive utility of the MAYSI-2 scale scores was surprising. Although other variables cannot be ignored when attempting to make predictions about the likelihood of reoffending (e.g., age of first offense, gender, seriousness of offense), various areas of psychiatric functioning also have been associated with recidivism (e.g., Cottle, Lee, & Heilbrun, 2001), and stronger outcomes were expected in the present study. Nonetheless, present findings corroborate past research demonstrating that, among the various areas of psychiatric functioning, substance abuse is likely one of the strongest predictors of recidivism for both boys and girls. This would suggest that valuable resources should be used for accurate identification and effective treatment of substance abuse among juvenile offenders. In many jurisdictions, this is already the focus of many treatment programs offered through the juvenile justice system. For example, it is estimated that approximately 66% of facilities offer onsite substance abuse services (Snyder & Sickmund, 2006)

Future research on the predictive utility of MAYSI-2 scale scores could evaluate whether better predictions are offered when specific offense categories are used as the dependant variable (e.g., violent versus non-violent). Further, the predictive utility of the MAYSI-2 scale scores should be compared to that of more comprehensive measures of

psychiatric adjustment (e.g., MMPI-A, MACI, diagnostic interviews). Of course, researchers would be wise to consider the possibility that an adolescent's general mental health functioning is of very limited utility in predicting recidivism, at least in comparison with variables, such as SES, race, and prior criminal behavior.

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Elise Christina Simonds Bisbee attended Southern Methodist University from 2001 to 2005 and earned a Bachelor of Arts degree in Psychology. She completed her undergraduate Honors Thesis, entitled “Clients’ & Therapists’ Ratings of Change in a Drug Treatment Court,” under the advisement of Robert Hampson, Ph.D. Immediately following her undergraduate education, Elise was accepted to the Virginia Consortium Program in Clinical Psychology (VCPCP) in order to pursue the Doctor of Clinical Psychology degree. There, she served as research assistant to Robert P. Archer, Ph.D. and Richard W. Handel, Ph.D. at Eastern Virginia Medical School (EVMS). Her primary area of interest was personality assessment. Elise’s third year concentration was in Neuropsychology at the Neuropsychology Center at EVMS. During her graduate training, Elise served on the Advocacy Coordinating Team for the American Psychological Association of Graduate Students, and was a Member-at-Large for the Society of Personality Assessment, Graduate Students. Additionally, she was awarded a scholarship through EVMS as a member in the first class of the Health Professions Scholars Program. Elise will complete her clinical internship at the Veterans Affairs Medical Center in Durham, North Carolina, where she has focused primarily on Acute Mental Illness and combat-related Post-Traumatic Stress Disorder. She plans to graduate with her Psy.D. in Clinical Psychology in August 2009.