

# THE UTILITY OF THE MMPI-A IN IDENTIFYING TRAUMA SYMPTOMS

by

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(Under the Direction of Brian Glaser)

## ABSTRACT

A significant amount of youths involved in the juvenile justice system have experienced childhood maltreatment and/or grief and loss and the mental health consequences of such events may have assisted in the development of the mental health and behavioral problems that resulted in juvenile court involvement. As such, the MMPI-A, the most commonly used assessment measure among forensic psychologists working with this population, should be evaluated to determine if it has utility in identifying youths whose mental health and behavioral problems may be related to such traumatic events. This study examined the mental health consequences of childhood traumatic events, specifically types of childhood maltreatment and grief and loss, by the profiles and responses produced on the MMPI-A in a sample of juvenile offenders. Results of the statistical analyses suggest that there are significant differences between the MMPI-A profiles of juvenile offenders with a history of trauma and those without. It was also determined that a scale can be developed that aides in differentiating between the two groups of juvenile offenders. The clinical implications of this study suggest that the mental health reactions of juvenile offenders with a history of trauma are in line with a complex trauma perspective (Cook et al., 2005), as opposed to a posstraumatic stress disorder reaction. The profile and potential scale identified in this study can be utilized in settings where the MMPI-A is administered with

juvenile offenders to alert clinicians to a possibility of the adolescent having a history of trauma, particularly childhood maltreatment and/or grief and loss.

**INDEX WORDS:** Trauma, MMPI-A, Juvenile offender, Assessment, Psychological evaluation, PTSD, Physical abuse, Sexual abuse, Neglect, Grief and loss, Multiple victimizations

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## DEDICATION

This work is dedicated to many individuals:

To my husband, Patrick, whose support, time, and love are priceless. To my son, Sullivan, who has made finishing this document infinitely harder, but more satisfying than I could have imagined at the outset. To my sister, Mal, and my brothers, Stephen and Greg, whose love and humor keep me grounded. To Marilyn and Denny, who have provided so much support and encouragement, as well as time and patience, to my future success. And lastly, to my mom and dad, who instilled in me an inquiring mind, a love of learning, and the belief that I could grow up to be whatever I wanted.

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## Chapter One

The juvenile justice system has become a growing arena for research into psychological disorders in children and adolescents due to increasing recognition that a majority of youth involved in the juvenile justice system have significant mental health problems, often meeting the Diagnostic and Statistical Manual, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000 ) criteria for one or more diagnosable psychiatric disorders. One large randomized study of juvenile detainees in a large metropolitan U.S. city found that 66% of males and 73% of females met criteria for at least one mental health diagnosis, including conduct disorder. Additionally, 60% of males and 70% of females still qualified for a mental health diagnosis when the conduct disorder diagnosis was excluded (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). From a biopsychosocial perspective, mental health disorders in this population could be argued to be a result of a confluence of environmental and intrapersonal factors. One major influence on the development of mental health disorders in the juvenile justice population has been identified as traumatic experiences. The mental health sequelae of traumatic event exposure have received increasing attention as an area of concern for juvenile offenders. In studies investigating rates of trauma exposure in juvenile offenders, the rates of exposure to at least one traumatic event ranged from 70% to 92.5% (Abram et al., 2004; Cauffman, Feldman, Watherman, & Steiner, 1998; Dixon, Howie, & Starling, 2005; Garland et al., 2001). The mental health consequences of experiencing a trauma, either one or multiple events, in children and adolescents include: PTSD, separation anxiety/other anxiety disorders,

major depressive disorder, attention deficit/hyperactivity disorder, brief psychotic disorder/psychotic disorder NOS, oppositional defiant disorder, conduct disorder, substance abuse disorders, self-injurious behaviors, alexithymia, sexual behavior problems, positive psychotic symptoms, psychological dissociation, and somatoform dissociation (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Caffo, Forresi, & Lievers, 2005; Famularo, Fenton, Kinscherff, & Augustyn, 1996; Putnam, 1997; Streeck-Fischer & van der Kolk, 2000).

Due to the previously mentioned high incidence of psychological disorders in children and adolescents involved in the juvenile justice system, psychological evaluations are utilized to identify mental health problems and provide treatment recommendations in this system. The Minnesota Multiphasic Personality Inventory – Adolescent (MMPI-A; Butcher et al., 1992) has been identified as the most frequently used self-report personality measure utilized with adolescents (Archer & Newsome, 2000), and is a popular tool among forensic psychologists working within the juvenile justice system (Archer, Buffington-Vollum, Stredny, & Handel, 2006). The MMPI-A is used with the juvenile offender population to assess pathology and the resultant profiles from this instrument often provide descriptive information about the respondent's mental health and personality. It has not been established if there are profiles that are common for juvenile offenders who have experienced trauma. Additionally, while the MMPI-A has numerous scales assessing areas of pathology ranging from mood to substance abuse disorders, the MMPI-A does not currently have a scale that identifies and assesses the level of mental health consequences of trauma exposure in adolescents. Since the MMPI-A is such a widely used tool, it would be beneficial to the evaluator and to the systems that utilize this instrument with juvenile offenders if MMPI-A items associated with trauma exposure were

identified and evaluated for utility in scale that assesses symptoms of mental health problems related to trauma exposure.

### **Purpose of Study**

The proposed study will explore MMPI-A profiles and item-level responses of adolescents involved in the juvenile justice system who self-reported experiencing traumatic events, particularly events classified as childhood maltreatment or grief and loss. Adolescents involved in the juvenile justice system completed an MMPI-A and participated in an in-depth interview that inquired into the individual's trauma history as part of a psychological evaluation. These interviews were coded to identify the participant's exposure to any of the following traumatic events: physical abuse/assault only, sexual abuse/assault only, neglect only, experiencing a major loss and/or separation only (e.g. death of a parent, removal from home by a protective services agency), or a combination of the previously mentioned forms of trauma. Interviews were also coded for specific denial of exposure to any of these traumas. The MMPI-A score profiles of those who experienced any type of trauma were compared with those who denied such experiences to determine if differences exist between the scores of the two groups that can be identified as being associated with experiencing trauma among juvenile offenders. The previously identified six types of trauma created groups of specific trauma exposure between which the MMPI-A score profiles were compared to determine if differences exist between the scores associated with these types of trauma. Profiles were also examined among gender and racial variables to the influence of trauma exposure on juvenile offenders of different genders and self-reported races.

Another aim of this study is to determine if adolescents involved in the juvenile justice system who have experienced trauma have consistent differences in item level responses from

those who do not endorse experiencing trauma. The MMPI-2 has a scale that identifies symptoms of PTSD in respondents (Keane, Malloy, & Fairbank, 1984). Although a similar scale may be useful for adolescents, PTSD does not encompass all of the mental health reactions to traumatic events (Abram et al., 2007; Carrion & Steiner, 2000; Colins et al., 2009; Dixon, Howie, & Starling, 2005). If juvenile offenders exposed to the previously mentioned traumatic events have an identifiable pattern of responding that indicates to the evaluator the possibility of trauma exposure, the evaluator could further explore the youth's trauma history and possible symptoms in light of that exposure.

The proposed study has several specific purposes. First and foremost, this study aims to advance our knowledge about the MMPI-A and its usefulness with victims of trauma in the juvenile justice population, an often over-looked and underserved population. Counseling Psychology has a long history in the development of the field of psychological assessment and regards assessment as an important role for counseling psychologists (Watkins & Campbell, 1990). Accordingly, this study attempted to advance the utility of the MMPI-A in providing useful clinical information to better guide treatment. Additionally, Counseling Psychology has a long-standing history of advocating for individuals who cannot advocate for themselves. Accordingly, this study hopes to provide useful interpretative information to clinicians who use the MMPI-A with juvenile offenders. The results of this study may help these clinicians provide more specific and effective treatment interventions to adolescents who may not know to ask for them. Another specific purpose is to examine how juvenile offenders who have experienced traumatic events, but may or may not have diagnoses of PTSD, respond on a commonly-used assessment tool. This study will also add to the growing body of research on the MMPI-A, will



contribute to the literature examining mental health concerns in the juvenile offender population, and will contribute to the literature on how trauma impacts normative and delinquent behavior.

### **Statement of Problem**

Trauma exposure among children and adolescents in the community has been estimated to range from 15% (Cuffy et al., 1998) to 69% (Norris, 1992). Rates of trauma exposure in samples of juvenile offenders have ranged from 70% to 92.5%, which is consistently higher than community samples (Abram et al., 2004; Cauffman, Feldman, Waterman, & Steiner, 1998; Dixon, Howie, & Starling, 2005; Garland et al., 2001). Exposure to trauma may cause significant mental health difficulties, including PTSD, separation anxiety/other anxiety disorders, major depressive disorder, attention deficit/hyperactivity disorder, brief psychotic disorder/psychotic disorder NOS, oppositional defiant disorder, conduct disorder, substance abuse disorders, self-injurious behaviors, alexithymia, sexual behavior problems, positive psychotic symptoms, psychological dissociation, and somatoform dissociation (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Caffo, Forresi, and Lievers, 2005; Famularo et al., 1996; Putnam, 1997; Streeck-Fischer & van der Kolk, 2000). Additionally, recent researchers have hypothesized that trauma exposure in childhood and/or adolescence may serve as a catalyst along a pathway that leads to involvement in the juvenile justice system (Ford, Chapman, Mack, & Pearson, 2006). This research suggests that trauma, particularly prolonged trauma such as childhood maltreatment, affects a youth so profoundly that it results in a diminished ability to regulate affect, increased rigidity in thinking, and limited coping skills. Additionally, it interferes with the youth's ability to empathize, decreases appropriate social skills, impulse control, ability to self-regulate, and contributes to the development of a poor future orientation. All of these effects are hypothesized to lead to increased psychological,

behavioral, and relational problems over the course of adolescence, which may result in juvenile court involvement.

Due to the high number of youths involved in the juvenile justice system with mental health disorders, as well as conflicting opinions regarding the purpose of the juvenile justice system to either punish or rehabilitate offenders, mental health disorders can be ignored, overlooked, or misdiagnosed. As previously stated, trauma exposure can result in a variety of mental health diagnoses or problems that may or may not explicitly identify traumatic experiences as a catalyst. Often, systems that come into contact with children who have been exposed to traumatic events, particularly the juvenile justice system, may be more likely to identify behavioral symptoms, such as acting out, rule-breaking behavior, and agitation, and professionals within those systems may not make a connection between the symptoms and the traumatic events in a youth's past.

Psychological evaluations are a routine part of the juvenile justice system in order to identify treatment needs for adjudicated youths. These evaluations have several purposes, but the most pressing is to screen for serious mental illness, particularly mental illness that involves antisocial behaviors, which some believe could help predict those youths who will continue to have court involvement throughout their lives. Additionally, juvenile courts also utilize the psychological evaluation to identify any interventions or treatment recommendations that could help rehabilitate or monitor the youth (Seagrave & Grisso, 2002). The juvenile justice system is, by its nature, more focused on externalizing symptoms (i.e. behavior problems and rule-breaking) than internalizing symptoms (i.e. anxiety and depression). As such, psychological evaluations in the juvenile justice system may not investigate a history of trauma exposure or emphasize a connection between trauma exposure and the individual's externalizing symptoms

and disruptive behaviors, even though research has identified trauma's strong influence on the mental health of youths involved in the juvenile justice system (Ford, Chapman, Hawke, & Albert, 2007). If information regarding a child's trauma history or the symptoms of mental health sequelae due to trauma were readily identifiable using measures already utilized in psychological evaluations, this could assist the juvenile courts and treatment providers within the system in providing interventions that address an underlying cause of the mental health and behavioral problems, a history of trauma exposure.

The Minnesota Multiphasic Personality Inventory – Adolescent (MMPI-A; Butcher et al., 1992) is the most commonly used self-report measure of adolescent psychopathology (Archer & Newsome, 2000). Its widespread use in forensic evaluations with juvenile offenders (Archer, et al., 2006) has led to significant research into the validity of its use with this population (Baum, Archer, Forbey, & Handel, 2009). The MMPI-A consists of 478 true-false items that load onto Validity, Clinical, Content, and Supplementary scales. Unlike the MMPI-2, none of the scales on the MMPI-A measure the mental health effects of trauma (Graham, 2000). The MMPI-2 (and the MMPI before it) have been used extensively with adult victims of trauma to assess the wide array of mental health difficulties that can result from trauma, which may not be reflected on a more specific Posttraumatic Stress Disorder Scale (Shercliffe & Victor, 2009). The MMPI-2 also includes a scale designed to measure symptoms associated with PTSD in adults, the PK scale (Keane, et al., 1984). However, the PK scale was developed and validated using a sample of combat veterans, not individuals who experienced trauma in a civilian setting.

Due to the wide use of the MMPI-A, especially with the juvenile offender population, it would benefit clinicians and clients for research to investigate its use in detecting the mental health effects of trauma. Of specific interest is identifying if a history of trauma exposure leads

to profile elevations on the MMPI-A Validity and Clinical scales that are different than juvenile offenders with no such trauma history, and if items could be identified that indicate the possibility of trauma exposure. If identified, this information may lead to more effective treatment recommendations and intervention delivery.

### **Hypotheses**

Based on previous research that examined profiles of individuals with a history of trauma exposure using the MMPI-2, the sparse research examining similar constructs using the MMPI-A, and by connecting symptoms previously identified to be associated with trauma exposure, the following hypotheses regarding the impact of trauma exposure on the MMPI-A profiles of juvenile offenders were made:

Hypothesis 1: Juvenile offenders who identify a history of trauma exposure will produce higher elevations on the MMPI-A Validity and Clinical Scales than those who denied a history of trauma exposure in the present sample.

Hypothesis 2: Juvenile offenders who experience sexual abuse and/or assault will have the highest level of elevations compared to the other trauma groups (physical abuse, neglect, grief and loss, and multiple victimizations).

Hypothesis 3: Female juvenile offenders who identify a history of trauma exposure will have higher elevations than male juvenile offenders who identify a history of trauma exposure.

Another aim of this study is to examine item-level responses to identify if a scale can be created that assists clinicians in recognizing the possibility of trauma-related mental health difficulties with juvenile offenders and relays a need for further exploration of that possibility.

This section will be exploratory in nature, but it is hypothesized that:

Hypothesis 4: Items can be identified from the MMPI-A which successfully distinguish juvenile offenders who are experiencing mental health difficulties as a result of trauma exposure from those who deny such traumatic experiences.

### **Definition of Terms**

#### **Trauma.**

For the purposes of this study, trauma is defined by Terr (1991) as “the mental result of one sudden, external blow or a series of blows, rendering the young person temporarily helpless and breaking past ordinary coping and defensive operations” (pg. 11), and includes not only events that are a shock/surprise to the victim, but also events that occur over a period of time and the victim can anticipate or be aware of their possibility.

#### **Posttraumatic Stress Disorder (PTSD).**

Posttraumatic Stress Disorder (PTSD) has been identified as a mental health diagnosis comprising of psychological and behavioral reactions to an identified stressor, the precipitating traumatic event. Its most recent definition in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (American Psychiatric Association, 2000) consists of the following criteria:

- A. The person has been exposed to a traumatic event in which 1) the event involved actual death or injury or threat thereof to the person or another individual, and 2) the person had a response of fear, helplessness, or horror, which may present as agitation or disorganized behavior in children.
- B. The person re-experiences the traumatic event in one (or more) of the following ways:
  - 1. Recurrent and intrusive disturbing recollections of the event

2. Recurrent, upsetting dreams about the event
  3. Feelings of reliving the event
  4. Psychological distress when exposed to internal or external reminders of the event
  5. Physiological distress when exposed to internal or external reminders of the event
- C. Persistent avoidance of stimuli associated with the traumatic event and a general numbing of responsiveness that was not present prior to the trauma through three or more of the following ways:
1. Avoidance of thoughts, feelings, and conversation pertaining to the event
  2. Avoidance of people, places, or activities that remind the person of the trauma
  3. Inability to remember important parts of the event
  4. Diminished participation or interest in previously enjoyed activities
  5. Feelings of detachment and estrangement from others
  6. Restricted range of affect
  7. Sense of a foreshortened future
- D. Persistent symptoms of hyperarousal that was not present prior to the event, involving two or more of the following:
1. Difficulty falling or staying asleep
  2. Irritability or anger outbursts
  3. Difficulty concentrating

4. Hypervigilance
5. Exaggerated startle response

The symptoms described in criteria B, C, and D must have been present for at least one month and these disturbances cause significant impairment in social, occupational or other important areas of functioning.

#### **Juvenile Offender.**

For the purposes of this study, a juvenile offender is an individual under the age of 18 who has been adjudicated of an offense, which may include status offenses. These individuals are involved in the juvenile justice system either through the probation office or through juvenile detention.

#### **Interpersonal Trauma.**

The World Health Organization identified violence to be a significant global health problem in 1996. This report defined multiple types of violence, one being interpersonal violence (Krug, Mercy, Dahlberg, & Zwi, 2002). Interpersonal violence includes two subcategories: violence/trauma perpetrated among family members and intimate partners, and community violence/trauma. Of interest to this study, family and intimate partner violence usually occurs within the home among family members and/or intimate partners, and includes physical, sexual, and psychological abuse, as well as physical neglect. Additionally, some have added significant separation and/or loss as a part of the broader category of interpersonal trauma that is not limited to interpersonal violence (Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001). In this study, the term Interpersonal trauma will be used to refer to the collective grouping of traumatic events of: physical abuse, sexual abuse, neglect, and separation from/loss of a significant person in childhood.

**Physical Abuse.**

Physical abuse has been defined many ways, and research often does not ascribe to one particular definition. However, a widely accepted definition comes from a recent National Incidence Study (Sedlak & Broadhurst, 1996). Physical abuse, as defined by the NIS-3 is when a child under the age of 18 has experienced injury (the harm standard) or risk of injury (the endangerment standard) as a result of having been hit with a hand or other object, or having been kicked, shaken, thrown, burned, stabbed, or choked by a parent or someone in a caregiver position.

**Neglect.**

Neglect has also been defined differently depending on the needs of the researcher or the needs of the defining party. It has been difficult to define, as authorities have debated over whether acts should be considered neglect if there is a potential for harm, without any actual harm being done. Additionally, it has been defined based on acts of omission by the caregiver, which are harder to identify and explicate than other forms of child maltreatment which involve specific acts of abuse. Another dimension that confounds the definition of abuse is whether one should define neglect as not meeting a child's basic needs (e.g. shelter, safety, food) from the child's perspective, regardless of the family's context (e.g. homelessness and poverty) or if family context mitigates neglect, as in some cases, neglect is not a lack of concern, but a lack of resources (Dubowitz et al., 2005). The broad category of neglect consists of many different acts of omission, ranging from not providing a child with appropriate medical care to physically abandoning the child, which makes one definition difficult to develop. All of these issues have resulted in varied definitions of neglect. The NIS-3 definition of physical neglect is commonly accepted and will be used in this study (Sedlak & Broadhurst, 1996). Physical neglect refers to



harm or endangerment to a person under the age of 18 as a result of inadequate nutrition, clothing, hygiene, and/or supervision.

### **Sexual Abuse.**

Sexual abuse can again be defined according to the NIS-3 definition, which identifies unwanted touching and/or acts of a sexual nature perpetrated against a minor including any or all of the following: being forced to engage in sexual acts that may or may not have involved penetration, fondling, groping, inappropriate kissing and hugging, and any other acts that have a sexual nature that are perceived to be inappropriate (Sedlak & Broadhurst, 1996).

### **Grief and Loss.**

As will be discussed in more detail in the next chapter, loss of a loved one or removal from the care of a loved one can be traumatic for children and result in significant mental health difficulties (Breslau, Wilcox, Storr, Lucia, & Anthony, 2004; Pecora, Jensen, Romanelli, Jackson, & Ortiz, 2009). For the purposes of this study, the category of grief and loss will include the following events: Death of a parent/caregiver, separation from the primary caregiver in the form of removal from the home by an agency, or being abandoned by the primary caregiver to live with relatives.

### **Multiple victimization.**

There is research that suggests children/adolescents who are victimized in one manner, are often likely to be victimized again and/or victimized in a different manner (Finkelhor, Ormrod, & Turner, 2007b; Lynch & Cicchetti, 1998). For the purposes of this study, multiple victimization is the experience of more than one type of traumatic event previously mentioned (physical abuse, sexual abuse, neglect, and grief and loss).

## Chapter Two

### Psychological Disorders in the Juvenile Offender Population

Juvenile offenders in the United States have experienced increased inquiry into their mental health as researchers and professionals in the field have gained understanding that mental health issues play a role in the pathway to delinquency. In one of the most expansive and comprehensive studies evaluating the mental health issues of juvenile offenders to date, Teplin and colleagues (2002) randomly assessed 1829 youths detained at a detention facility. Using a structured diagnostic interview, these researchers found a startling prevalence of mental health disorders, with some variation depending on race and gender. Overall, 66% of males and 73% of females met criteria for at least one mental health diagnosis, including conduct disorder. Interestingly, 60% of male juvenile detainees and 70% of female juvenile detainees still qualified for a mental health diagnosis after excluding conduct disorder. In this sample, 18.7% of males and 27.6% of females met DSM-III criteria for an affective disorder, 21.3% of males and 30.8% of females met DSM-III criteria for an anxiety disorder, 16.6% of males and 21.4% of females met DSM-III criteria for attention-deficit/hyperactivity disorder, 41.4% of males and 45.6% of females met criteria for a disruptive behavior disorder, and 50.7% of males and 46.8% of females met criteria for a substance use disorder. These results indicate that overall, youth involved in the juvenile justice system have much higher rates of mental health diagnoses compared to a 17.1% diagnostic rate for at least one mental health diagnosis in a sample of 4175 randomly sampled 11-17 community youths (Roberts, Roberts, & Xing, 2007).

There are many hypothesized reasons as to why youths involved in the juvenile justice system have such a high prevalence of mental health disorders. One such hypothesis involves the influence of trauma exposure in childhood/adolescence as a catalyst for mental health problems that lead an individual down the pathway to delinquency (Ford, et al., 2007). Childhood and/or adolescent exposure to trauma, particularly chronic trauma in the form of childhood maltreatment, can result in a variety of mental health difficulties and impede appropriate personality and behavioral development to such a degree that while all victims of childhood trauma do not end up in the juvenile justice system or with serious psychopathology, a significant number of individuals in the juvenile justice system or who have serious psychopathology have been victims of childhood trauma.

### **Childhood/Adolescent Trauma and its Mental Health Effects**

#### **Childhood trauma.**

Childhood trauma has been conceptualized multiple ways by different theorists. Terr (1991) defined trauma as “the mental result of one sudden, external blow or a series of blows, rendering the young person temporarily helpless and breaking past ordinary coping and defensive operations” (pg. 11), and includes not only events that are a shock/surprise to the victim, but also events that occur over a period of time, which the victim can anticipate or be aware of their possibility. There are multiple ways to classify or categorize traumatic events. One popular categorization is interpersonal vs. non-interpersonal traumatic events. Interpersonal trauma consists of traumatic events that a person or persons perpetrates on another, including physical abuse, sexual abuse, emotional abuse, and neglect (which collectively comprise the term childhood maltreatment). Non-interpersonal traumas consist of events that are accidental, such as a car accident or a fire, and acts of nature, such as a hurricane (Krug, et al.,

2002). Alternatively, Terr (1991) suggested classifying traumatic events based on the event's frequency of occurrence and whether it was anticipated or not. Type I traumatic events are terrifying events that occur once and are a shock to the individual, such as witnessing a murder. Type II traumatic events are terrifying events that occur over a prolonged amount of time or consist of repeated experiences and do not have to be shocking, as they may be anticipated, such as prolonged physical abuse during childhood. Different mental health disorders have been associated with different types of traumatic events individually (e.g. experiencing only sexual molestation or only witnessing domestic violence). Mental health disorders have also been associated with groupings of interpersonal or non-interpersonal traumas, and also with Type I or Type II traumatic events. These mental health difficulties will be explored in detail in later sections.

#### **Rates of exposure to traumatic events.**

Rates of traumatic events in the general population indicate that a significant number of adults have experienced traumatic events during their childhood/adolescence. One large study surveyed adult HMO members about adverse childhood experiences, specifically childhood abuse (emotional/psychological, physical, and sexual) and exposure to dysfunctional home environments (Felitti et al., 1998). This study found that among the 8,056 participants 25.6% reported exposure to substance abuse, 22.0% reported being the victim of sexual abuse, 18.8% reported living with a family member with mental illness, 12.5% reported witnessing domestic violence, 11.1% reported having been emotionally/psychologically abused as a child, 10.8% reported physical abuse, and 3.4% reported the incarceration of a household member.

Another study assessed exposure to traumatic events in a community sample of adolescents through a semi-structured interview, with responses categorized into four areas:

rape/child sexual abuse, criminal threat to the life of the subject or witnessing a crime that threatened another's life, witnessing an accident or medical emergency, and personally experiencing an accident/medical emergency that threatened life. The results identified that in a sample of 490 adolescents ages 16-22 , 11.6% of White males reported exposure to at least one traumatic event, 16.6% of White females reported exposure to at least one traumatic event, 15.8% of Black males reported exposure to at least one traumatic event, and 25.2% of Black females reported exposure to at least one traumatic event (Cuffe et al., 1998). These rates of exposure to traumatic events that may occur in childhood suggest that there may be a high rate of trauma exposure among general community populations. These studies highlight the difficulty in obtaining reliable rates of trauma exposure, as there is not one agreed upon definition of what constitutes the broad category of traumatic event.

Recent studies investigating trauma exposure and psychological consequences of trauma exposure in juvenile offenders found rates of exposure to at least one traumatic event ranged from 70% to 92.5% (Abram et al., 2004; Cauffman, Feldman, Watherman, & Steiner, 1998; Dixon, et al., 2005) The largest of these studies reported that 92.5% of the 1829 juvenile detainees sampled reported exposure to at least one traumatic event, and 84.0% reported exposure to more than one trauma. The median number of traumatic events experienced by this sample was six (Abram et al., 2004; Teplin et al., 2002). This study surveyed the following traumatic events: experiencing a life-threatening situation personally or by someone close to the participant, being a victim of physical abuse/assault or of sexual abuse/assault, being threatened with a weapon, involvement in a bad accident, natural disaster, witnessing someone get hurt or killed, and having seen the dead body of a significant person, in real life or in pictures.

### **Trauma exposure and delinquency.**

As previously mentioned, the various definitions of trauma and the wide range of experiences that are considered traumatic make comparison of the rates of trauma exposure difficult. Despite these differences in classification and how traumatic events are studied, childhood maltreatment (physical abuse, sexual abuse, and neglect) has been strongly delineated as a significant grouping of traumas. Research has demonstrated that maltreated youth who do not receive appropriate treatment or intervention have a higher likelihood of becoming involved in the juvenile justice system (Widom, 1992). Approximately 3 million cases of child abuse and neglect in the United States, are reported annually (U.S. Department of Health and Human Services, 2009). Widom's research on and identification of the Cycle of Violence (1989, 1992; Widom & Maxfield, 2001), which examined the transmission of violence intergenerationally, found experiencing childhood maltreatment increased chances of being arrested as a juvenile by 59%, being arrested as an adult by 28%, and being arrested for a violent crime by 30% (Widom & Maxfield, 2001). One study examined the effects of maltreatment experienced in childhood only, adolescence only, or maltreatment in childhood and adolescence (combined group). This study found that youths who experienced maltreatment in the combined group, had significantly higher levels of criminal behavior, involvement in violent crime, and higher arrest and incarceration rates than the other maltreatment groups and the non-maltreatment groups (Thornberry, Henry, Ireland, & Smith, 2010). Smith and Thornberry (1995) examined the effects of childhood maltreatment before the age of 12 on documented and self-reported delinquent behaviors. This study found that experiencing childhood maltreatment before the age of 12 significantly increased the likelihood of being arrested for an offense as a juvenile and also increased the amount of self-reported delinquent acts of varying severity. An earlier study found

that childhood maltreatment increased the risk for violent offending, particularly for males and Black youths (Rivera & Widom, 1990). Also, this study found abused and neglected youths engaged in delinquent acts earlier than their nonmaltreated counterparts. A prospective, longitudinal study that examined the link between experiencing physical abuse in early childhood and later offending found that physical abuse in the first five years of life resulted in an increased rate of arrests for violent, non-violent, and status offenses as juveniles (Lansford et al., 2007). Another prospective, longitudinal study examined the link between experiencing physical abuse and neglect prior to the age of 12 on later violent offending and found abused and/or neglected youths had significantly higher rates of arrest for violent offenses than their non-abused/neglected counterparts (Mersky & Reynolds, 2007).

Childhood sexual abuse has been found to be related to increased likelihood of engaging in violent and non-violent delinquent behaviors, particularly in females, when compared to non-maltreated counterparts and counterparts who experienced other forms of abuse (Herrera & McCloskey, 2003; Siegel & Williams, 2003). One longitudinal study found childhood sexual abuse to be a risk factor for later delinquent and aggressive behavior, aside from related risk factors such as age, sex and socioeconomic status (Swanston et al., 2003). Overall, research has linked childhood trauma, particularly childhood maltreatment, with later involvement in the justice system, both as a juvenile and as an adult offender.

### **Trauma exposure and mental health difficulties.**

Trauma, as a whole, has been associated with a variety of mental health disorders and diagnoses. Different types of trauma have been found to result in different mental health disorders, as well as cause impairment in different areas of functioning. The following

subsections examine the mental health consequences of different categorizations and types of trauma, as established in the literature.

***Interpersonal trauma.***

One recent study investigated the relationship between type of trauma and PTSD in children and adolescents (Luthra et al., 2009). This study found that experiencing interpersonal traumatic events (refer to definition in Chapter One; most often includes separation and loss, physical abuse, sexual abuse, emotional abuse, physical neglect, and witnessing domestic violence) was significantly associated with meeting criteria for a PTSD diagnosis. Alternatively, noninterpersonal traumatic events and witnessing community violence were not associated with PTSD.

***Mental health effects of Type I vs. Type II traumas.***

Terr proposed characterizing traumatic events into Type I and Type II traumas in her influential 1991 article. As previously mentioned, Type I traumas consist of unanticipated, shocking single events, while Type II traumas are long-standing or repeated disturbing events. Terr suggests that surprise/shock may be a part of the traumatic event, but is not necessary to define a Type II traumatic event and that events with long-standing anticipation or that can be predicted by the child (e.g. the death of a parent from an illness or experiencing child abuse) can be equally as traumatic as a sudden shock. Terr suggested that while a child's reaction to the trauma may be influenced by whether it was a Type I or a Type II trauma, there are four characteristics usually demonstrated by a child following exposure to either type of trauma. These include: 1) visualizing or otherwise perceiving memories of the trauma, 2) engaging in repetitive behaviors, 3) having trauma-specific fears, and 4) having a changed attitude about people, life, and the future.



Terr also identified characteristics specific to children who experienced either Type I or Type II traumas. Type I traumas were characterized by 1) having very detailed memories of the event, 2) experiencing “omens”, usually involving the child retrospectively examining the traumatic events for clues that could have provided warning about the danger, and 3) misperceptions and mistimings, which may include hallucinations about the event (seeing a relative who died in the event). Type II traumas are characterized by 1) engaging in denial and psychic numbing, 2) engaging in self-hypnosis and dissociation, and 3) experiencing rage and extreme anger. These coping mechanisms identified as present in Type II traumas are more likely to result in the long-term mental health problems of personality disorders and dissociative identity disorders than Type I traumas.

This classification highlights a difficulty in assessing trauma symptoms in juvenile offenders; the DSM-IV-TR criteria for PTSD is currently the only trauma specific diagnosis. It was originally developed to capture the experience of combat veterans (American Psychiatric Association, 2000), thus identifying symptoms associated with events that would be more like Type I traumas, involving shock and an identifiable end. However, symptoms associated with childhood maltreatment, which would usually be classified a Type II trauma, are more likely to be found in juvenile offenders (Kerig, Ward, Vanderzee, & Arnzen Moeddel, 2009). While the DSM-IV-TR has identified how PTSD symptom presentation in children and adolescents may differ from the presentation in adults, most assessment tools still focus on the basic DSM-IV-TR criteria to diagnose PTSD. Thus many adolescents who have experienced childhood maltreatment are assessed for PTSD with instruments that look for symptoms associated with Type I traumas, not Type II.

*Mental health effects of childhood maltreatment.*

Although childhood maltreatment falls into the previously mentioned categories, it deserves attention, as it is a frequently investigated construct in relation to its mental health consequences. However, there are some problems in investigating the incidence of childhood maltreatment, as many instances of abuse and neglect go unsubstantiated for numerous reasons. Additionally, research has identified that victims of physical and sexual abuse may not disclose such events when labeled as “abuse”, but will endorse such events when described behaviorally or as physical or sexual assault, leaving out the word “abuse” (Cascardi, Mueser, DeGiralomo, & Murrin, 1996; Goodman, Rosenberg, Mueser, & Drake, 1997). One study examined the mental health status of children who experienced physical abuse alone, sexual abuse alone, or both physical and sexual abuse based on child and caregiver report of symptoms (Ackerman, et al., 1998). According to caregiver reports, boys had higher rates of externalizing disorders than girls in all abuse groups, significantly higher rates of conduct disorder and oppositional defiant disorder (ODD) were reported for the groups who experienced physical abuse only and both physical and sexual abuse than the group who experienced sexual abuse only. Additionally, the most frequent diagnosis according to symptoms reported by caregivers was separation anxiety disorder, followed by ODD, ADHD, phobic disorder, and PTSD. According to child report of symptoms, phobic disorder was the most frequently identified diagnosis, followed by PTSD, separation anxiety disorder, and ODD. Additionally, based on both child and caregiver reports of symptoms, PTSD was highly comorbid with mood disorders and other anxiety disorders. Another study that examined the comorbidity of PTSD and other mental health diagnoses among maltreated children found PTSD to be highly comorbid with ADHD, other anxiety disorders, Brief Psychotic Disorders and Psychotic Disorder NOS, suicidal ideation, and a trend toward

mood disorders (Famularo, et al., 1996). Additionally, there is a plethora of research on the effects of the individual categories of abuse that constitutes childhood maltreatment, including physical abuse, sexual abuse, and neglect, which are reviewed in the following sections.

*Physical abuse.*

10.8% of victims of substantiated reports of abuse experienced physical abuse, with no sex differences between the victims of the abuse (U.S. Department of Health and Human Services, 2009). One prospective, longitudinal study of a community sample of children and adolescents found that experiencing physical abuse during the first five years of life was associated with rates of aggressive behaviors, anxiety/depression, delinquent behaviors, PTSD, dissociation, social problems, thought problems, and social withdrawal twice as high as their non-abused counterparts, and which could not be accounted for by other risk factors associated with early maltreatment (Lansford et al., 2002). One study of a community sample of children ages 3-18 found that physical abuse, sexual abuse and witnessing domestic violence were equally associated with rates of PTSD diagnosis. However, only experiencing physical abuse and witnessing domestic violence predicted the severity of PTSD symptomology (Silva et al., 2000). Kaplan, Pelcovitz, and Labruna's (1999) review of the literature of mental health outcomes of experiencing childhood physical abuse indicate that physically abused children have significant deficits in social functioning. Also, aggressive and delinquent behaviors are some of the most commonly identified correlates of physical abuse. Physically abused children/adolescents are also more likely than non-abused counterparts to engage in suicidal and risk-taking behaviors. Formal mental health diagnoses associated with experiencing childhood physical abuse include: depressive disorders, anxiety disorders, conduct disorder, oppositional-defiant disorder, attention/deficit-hyperactivity disorder, and substance abuse disorders. Additionally, physical

abuse in childhood has been identified as a risk factor for paranoid and antisocial personality disorders in adulthood (Bierer et al., 2003).

*Sexual abuse.*

According to the U.S. Department of Health and Human Services (2009), 7.6% of victims with substantiated reports of abuse experienced child sexual abuse. Child sexual abuse has been investigated extensively in terms of its mental health and behavioral outcomes. A review of the literature between 1987 and 1995 examined the long-term mental health and behavioral correlates of experiencing child sexual abuse (Polusny & Follette, 1995). This review found that survivors of child sex abuse had higher levels of general psychological distress than non-abused samples. Additionally, survivors had higher rates of major psychological disorders, specifically major depression, suicidal behaviors and parasuicidal behaviors, anxiety disorders, including, but not limited to, PTSD, substance abuse disorders, eating disorders, dissociative disorders, somatic complaints and disorders, and personality disorders, particularly borderline personality disorder. A more recent study identified child sexual abuse as a risk factor for paranoid and antisocial personality disorders in adulthood (Bierer, et al., 2003).

Additionally, child sexual abuse has effects that do not fall into diagnostic categories, but interfere with the individual's everyday functioning. Research has indicated that survivors of child sexual abuse have higher rates of impairment in social relationships and interpersonal functioning than non-abused counterparts (Polusny & Follette, 1995). Also, survivors of child sexual abuse have higher rates of engaging in risky sexual behavior, and are at high risk for revictimization, both through sexual and physical assault. The model Polusny and Follette (1995) developed out of a review of the child sexual abuse literature proposes that the above

listed negative behaviors are a means of emotional avoidance, so as to temporarily alleviate negative feelings associated with the sexual abuse experienced.

A more recent review of the literature on mental health effects of child sexual abuse also examined risk factors identified in the research, as well as separated the mental health sequelae into short-term and long-term effects of child sexual abuse (Putnam, 2003). This review identified that girls are two to three times more likely than boys to be a victim of child sexual abuse. However, it has been suggested that this discrepancy may be more an artifact of differences in reporting rates for males and females, and also that male victims may be more likely to enter into the juvenile justice system instead of a mental health treatment program, where they are less likely to be asked about history of sexual victimization. Another risk factor for child sexual abuse is age, with risk of victimization increasing with age. Family constellation, particularly the absence of one or both parents is a significant risk factor for child sexual abuse. Socioeconomic status has not been identified as a risk factor for child sexual abuse, as it is for physical abuse and neglect. Similarly, race has not been identified as a significant factor in victimization; however, it may be a significant factor in the severity of mental health reactions to the traumatic experience, with research identifying Latina girls to have more severe mental health reactions to sexual abuse than African-American or White girls. This review of the literature supports the previous mental health disorders identified as consequences of child sexual abuse, particularly depression. Additionally, research has identified early sexualized behavior as a consequence of child sexual abuse in children, and while this overt display of behavior may decrease with age, research supports that survivors of child sexual abuse, particularly females, have higher rates of engaging in risky sexual behavior in adolescence.

While child sexual abuse may result in a variety of mental health disorders, survivors of child sexual abuse as a group, irrespective of their psychiatric diagnoses, have been found to have significant problems with affect regulation, impulse control, somatization, sense-of-self, cognitive distortions, and problems in social situations (De Bellis, 2001). It has been hypothesized that these negative reactions are a result of disruptions in brain development that is facilitated through child-caretaker interactions, which may be disrupted by child sexual abuse.

*Neglect.*

Despite child neglect being the most prevalent form of maltreatment in the United States, with 59% of substantiated maltreatment reports involving neglect (U.S. Department of Health and Human Services, 2009), it is the least investigated form of childhood maltreatment. Research has begun increased in recent years, although the “neglect of neglect” was identified in the literature more than two decades ago (Wolock & Horowitz, 1984). Part of what makes neglect more difficult to study than physical or sexual abuse is the more chronic, less incident-specific nature of neglect. A review of the literature identified important differences in mental health and behavioral outcomes of neglected children compared to abused or non-maltreated children, the most obvious being neglected children tend to demonstrate more internalizing behaviors as opposed to externalizing behaviors, and tend to have social difficulties in the form of being socially withdrawn, as opposed to being aggressive or socially inappropriate, as is more likely to be seen with physically abused children (Hildyard & Wolfe, 2002). Childhood neglects is also associated with higher rates of running away from home, increased involvement in the legal system as juveniles and adults, and an increased risk of personality disorders.

*Grief and Loss.*

Death of a loved one, especially a caregiver, has been argued by some to be considered a traumatic event. It has been argued that this is true not only for sudden losses (such as homicide) but also when the loss was anticipated (such as death due to disease; Terr, 1991). Loss of a caregiver has been identified as the most common traumatic event among children and adolescents. It was identified as the most distressing event by children who have experienced multiple types of traumatic events (Breslau, et al., 2004). The mental health effects of losing a caregiver or close family member have been identified as more complicated than once thought. One study found that in a sample of children and mothers attending a women's shelters, death or illness of someone close to the child was the strongest risk factor for PTSD in the child, followed by witnessing ongoing domestic violence (McCloskey & Walker, 2000). Major depressive disorder has also been found to be associated with death of a caregiver/significant person both during childhood and also in adulthood (Cerel, Fristad, Verducci, Weller, & Weller, 2006; Jacobs & Bovasso, 2009). Additionally, while a bereaved child may not meet the criteria for any one specific diagnosis, research has identified that these children may exhibit a range of symptoms that significantly impair functioning, including anxious and depressive symptoms, behavioral difficulties, angry outbursts, and behavioral regression (Dowdney, 2000).

As research has explored the effects of bereavement on mental health, practitioners and researchers have identified an additional diagnosis that is being investigated for its uniqueness as a disorder: Complicated grief (Prigerson et al., 1999). Complicated grief, which was originally identified retrospectively in bereaved adults, has been defined in multiple ways throughout its development. One study attempted to identify and define complicated grief as a separate disorder from PTSD, depression, and anxiety, and found that complicated grief in children is

composed of various symptoms of those three disorders, as well as increased suicidal ideation, but it stood alone as a distinct disorder (Melhem, Moritz, Walker, Shear, & Brent, 2007). While more research is needed to examine this newly constructed disorder and its uniqueness from other diagnoses, the identification of a disorder that attempts to capture the mental health consequences of childhood bereavement is a step towards understanding the mental health needs of that population.

Another area of grief and loss that has been identified to have negative mental health consequences on children is separation from the primary caregiver in the form of removal from the home or being abandoned by the primary caregiver to live with relatives. The mental health effects of placement in foster care alone is difficult to establish considering most children in foster care have been removed from the home due to maltreatment (Oswald, Heil, & Goldbeck, 2009). A review of the literature found that children in foster care may experience the following mental health disorders: PTSD, depressive disorders, anxiety disorders, behavioral disorders, alcohol abuse/dependence, drug abuse/dependence, and social phobias, with the lifetime prevalence for conduct disorder and oppositional defiant disorder being the most frequently reported diagnoses (Pecora, et al., 2009). Many of the children in foster care have more than one diagnosis, with depression and PTSD being the most commonly diagnosed comorbid disorders. Additionally, females in foster care had nearly twice the rate of depression as males (18.5% and 9.5% respectively) and almost three times the rates of diagnosed PTSD as males (Pecora, et al., 2009).

Kinship care (being raised by a member of the family not the biological parent) can also be traumatic for the child if the child was abandoned by the parent in this situation. One study found children placed with relatives informally had significant behavioral problems compared to



children placed in formal kinship care or foster care (Ehrle & Geen, 2002). This was hypothesized to be related to fact that children in voluntary kinship care are more likely to be placed in low income families and may be an additional financial and resource strain on the family. Additionally, the family taking in the child is less likely to be aware of and utilize public assistance available for raising this child compared with families in formal placement situations. However, other research has indentified that children in kinship care had fewer clinically elevated profile scores on the Child Behavior Checklist than those in formal foster care placements (35.8% and 51.8% respectively), indicting that children placed in kinship care had fewer mental health and behavioral problems than those in formal foster care. This was hypothesized to be due to children in kinship care being more likely to remain in their community and have more contact with their biological parents than children in formal foster care (Holtan, Rønning, Handegård, & Sourander, 2005).

#### *Multiple Victimization.*

Research has indicated that experiencing multiple types of trauma can have significant effects on a child's psychological and behavioral functioning. A significant portion of the research on childhood maltreatment and trauma has focused on a single type of trauma such as physical or sexual abuse. However, research has indicated that a large portion of children who experience one form of maltreatment also experience another form, thus making it difficult to draw conclusions about the mental health consequences of a single form of maltreatment (Turner, Finkelhor, & Ormrod, 2010). In a large national sample, 66% of respondents indicated they had experienced more than one type of victimization over their lifetime. Additionally, children who experience a form of maltreatment as opposed to another form of trauma, such as peer bullying, are significantly more likely to experience multiple type of traumas. This research

also found that experiencing more than one trauma was strongly associated with clinically significant mental health problems, even more than experiencing multiple episodes of the same type of trauma. Additionally, research suggests that multiple victimizations account for a significant portion of the mental health effects attributed to any one form of maltreatment (Finkelhor, Ormrod, & Turner, 2007a, 2009; Turner, et al., 2010).

*Complex Trauma.*

There has been a recent movement in the field of trauma research away from recognizing PTSD as the only mental health reaction to trauma, particularly with individuals who experience interpersonal trauma at an early age. Researchers have attempted to construct a diagnosis that encapsulates the complex mental health reactions of these children, adolescents, and adults, named Disorders of Extreme Stress, Not Otherwise Specified (DESNOS; Herman, 1992; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). Although this effort has many supporters, the result is another diagnosis that, despite best efforts, cannot capture all mental health reactions to trauma. Another direction the field has taken is away from constructing a diagnosis that attempts to capture the varied responses to interpersonal trauma and towards considering the client's presenting mental health symptomology in light of the traumas experienced, and along a continuum of severity. The name given to this is "Complex Trauma" (Briere & Spinazzola, 2005; Cook et al., 2005).

Research has identified that an individual's reaction to traumatic events is influenced by one's history of exposure to traumatic events, the presence of other mental health and substance abuse disorders, and environmental factors such as socioeconomic status, strength of support systems, and stigmatization of certain traumatic experiences. Considering childhood maltreatment from a complex trauma perspective, one diagnosis cannot not capture all of the

symptoms and reactions to this type of trauma, as there are so many facets of influence on the victim in these situations. Briere and Spinazzola (2005) identified complex trauma reactions impact an adult's self-capacities, which include disruptions in identity, affect regulation, and interpersonal relatedness. Complex trauma also manifests in cognitive disturbances, including low self-esteem, significant inappropriate guilt, helplessness and hopelessness, expectations of rejection and interpersonal loss, and viewing the world as a dangerous place. Symptoms of complex trauma have also been found to manifest in mood disturbances, including anxiety, depression, and excessive anger. Behaviors that may develop out of a complex trauma reaction include excessive avoidant behaviors, including substance abuse, self-harm behaviors, and suicidality. Somatoform symptoms have been linked to complex trauma reactions, particularly reactions to childhood maltreatment. Posttraumatic symptoms have also been found to be associated with complex trauma reactions, such as flashbacks, nightmares, avoidant behaviors to trauma reminders, and hypervigilance. However, these symptoms do not always meet criteria for the PTSD diagnosis.

Cook and colleagues (2005) evaluated complex trauma reactions in children and adolescents and identified seven domains through which symptoms of a complex trauma reaction manifest:

- 1) Attachment: Including problems with boundaries, distrust, isolation and social withdrawal, interpersonal difficulties, and problems with perspective-taking.
- 2) Biology: Including somatization.
- 3) Affect regulation: Including difficulty with emotional regulation, difficulty identifying and expressing emotions appropriately, difficulty describing their own feeling-state, trouble communicating one's needs and wants.

- 4) Dissociation: Including amnesia, depersonalization or derealization, having two or more separate states of consciousness, and having impaired memory for events.
- 5) Behavioral Control: Including poor impulse control, aggressive behaviors towards self and others, self-destructive behaviors, oppositional behaviors, difficulty following rules and authority, and re-enacting the trauma through play or behavior (e.g. aggressive behavior towards others).
- 6) Cognition: Including problems with attention and executive functioning behaviors, difficulty understanding responsibility, learning difficulties, problems with language development, and problems with orientation in time and space.
- 7) Self-Concept: Including having a lack of sense of self, low self-esteem, excessive shame and guilt, and not being able to understand oneself separate from others.

The category of complex trauma has received increasing research attention. The seven categories identified by Cook and colleagues (2005) as encapsulating a complex trauma reaction in children and adolescents correspond with diagnoses that are often considered to be comorbid with PTSD, or are present in children who experience childhood maltreatment but do not meet diagnostic criteria for PTSD, such as depression, anxiety, oppositional-defiant disorder, and conduct disorder (Briere & Spinazzola, 2005).

## **Trauma, Race, Ethnicity, and Gender**

### **Race and Ethnicity.**

Due to disproportionate minority representation in the juvenile justice system, as well as the tendency for research to generalize findings without regard to race differences, examining race as a possible factor influencing trauma exposure and the mental health consequences of trauma in juvenile offenders is important. According to the most recent National Incidence

Study of Child Abuse and Neglect (Sedlak et al., 2010), which provides estimates of the incidence of child abuse and neglect as defined in Chapter 1 based on national information on substantiated and unsubstantiated reports of abuse and neglect, Black children had significantly higher rates of suspected and substantiated maltreatment than White and Latino/a children. This discrepancy was seen across all previously discusses types of maltreatment (physical abuse, sexual abuse, and neglect). Another study also found overrepresentation of referrals and investigations for maltreatment among Black children, and underrepresentation for White children (Fluke, Yuan, Hedderson, & Curtis, 2003). However, these results do not imply that Black and White children experience maltreatment in disproportionate amounts, just that there is disproportionate reporting and investigation of Black and White children relative to what would be expected based on population. Additionally, it has been long argued that poverty significantly effects rates of maltreatment, with children who fall below the poverty line at higher risk for experiencing maltreatment (Berger, 2004). A recent study identified that, when controlling for poverty, there is not disproportionate Black representation in filed reports of child maltreatment. Additionally, this study found that among Blacks and Whites who live in high poverty, there is disproportionate reporting of White families to child protective agencies than would be expected based on population (Drake, Lee, & Jonson-Reid, 2009).

While there has been some research investigating the psychological sequelae of childhood abuse and neglect for children/adolescents of different races and ethnicities, this research has not been substantial, has been contradictory, and has focused on sexual abuse. A review of the literature found that Blacks do not differ significantly from Whites in diagnostic rates of PTSD (Pole, Gone, & Kulkarni, 2008). However, this review did not examine different types of trauma, only PTSD reactions to any type of trauma. Multiple research studies found that

Black and Latino/a children and adolescents had more severe psychological reactions to experiencing abuse/neglect than their White counterparts, including depressive symptoms, and behavior and self-esteem problems (Sanders-Phillips, Moisan, Wadlington, Morgan, & English, 1995; Stein, Golding, Siegel, Burman, & Sorenson, 1988). One study compared the psychological functioning of Black and Latina female adolescent victims of sexual abuse (Sanders-Phillips, et al., 1995). This study supported previous findings that Latina victims had higher levels of depression than their Black counterparts. The article suggested this could be due to many factors including identified differences in the victim's relationship with the perpetrator, reportedly less maternal support following disclosure, and an earlier age of onset of abuse. However, other research has not found such racial/ethnic differences in psychological reactions (Mannarino, Cohen, & Gregor, 1989).

A study of risk and protective factors for mental health outcomes among low-income African-American children found childhood maltreatment to be a strong risk factor for internalizing and externalizing problems compared with counterparts of the same race with no history of maltreatment (Gabalda, Thompson, & Kaslow, 2010). Another study found that African-American males with a history of childhood maltreatment were more likely to become involved in the juvenile justice system than same race counterparts who did not have such a history (Williams, Van Dorn, Bright, Jonson-Reid, & Nebbitt, 2010).

### **Gender.**

Research has identified that men and women tend to have different mental health reactions to trauma in terms of sensitivity to developing mental health difficulties following trauma exposure. Breslau (2002) found that while men had greater incidence of exposure to traumatic events, women were at higher risk for developing PTSD following traumatic exposure.

This increased incidence of PTSD in women was attributed to an increased incidence of women being the victims of assault; assault not only resulted in an increase in PTSD diagnoses, but also increased the risk of developing PTSD following a subsequent traumatic event. These findings were replicated in a study of urban young adults, which found that young women were more likely to develop symptoms of PTSD following traumatic exposure (Breslau & Anthony, 2007). Another study found the same disparity in mental health reactions between women and men, with women more likely to develop PTSD after a traumatic event. However, they identified that these mental health reactions were independent of the type of traumatic event experienced and the presence or absence of injury to the victim (Holbrook, Hoyt, Stein, & Sieber, 2002). This gender difference was also found to be true for adult survivors of childhood maltreatment, with women more than twice as likely as men to develop PTSD during their lifetime, regardless of the type of maltreatment experienced (Koenen & Widom, 2009). However, a significant portion of this gender difference could be explained by the substantial amount of re-victimization among female participants.

### **Mental Health Effects of Trauma in Juvenile Offenders**

Trauma has been linked with involvement in the juvenile justice system and delinquent behaviors (Stouthamer-Loeber, Loeber, Homish, & Wei, 2001). Recent research on the mental health of juvenile offenders has begun to pay attention to the role of trauma in the development of psychological disorders in this population. Many studies have focused on PTSD as the main outcome of trauma exposure, especially in juvenile offenders. Indeed, Abram and colleagues (2004) found that in a sample of 898 detained adolescents, 11.2% met DSM-IV criteria for PTSD. Upon examination of the traumas experienced by these juvenile offenders “having seen or heard someone get hurt very badly or killed” was endorsed by males as the most frequent

trauma precipitating PTSD, whereas thinking “you or someone close to you was going to be hurt very badly or die” was endorsed by females as the most frequent trauma precipitating PTSD. This study found no differences in rates of PTSD by race/ethnicity, and found that although males were more likely to have experienced trauma than females, females were as likely as males to have PTSD. Earlier studies with smaller sample sizes examined the rates of PTSD among juvenile offenders and found them to vary from 24% in a sample of juvenile offenders in the community (Burton, Foy, Bwanausi, Johnson, & Moore, 1994) to 48.9% (Cauffman, et al., 1998), and 37% (Dixon, et al., 2005) in samples of incarcerated female juvenile offenders to 31.7% in a sample of incarcerated male juvenile offenders (Steiner, Garcia, & Matthews, 1997). Another study found that African-American juvenile offenders were less likely to report symptoms of mental health problems or substance abuse than Caucasian counterparts, but were more likely to be the victims of violence and to experience traumatic events (Vaughn, Wallace, Davis, Fernandes, & Howard, 2008). These differences suggest that different subgroups of juvenile offenders have different needs in regards to treatment of trauma exposure. However, as previously highlighted, PTSD is not the only mental health outcome associated with exposure to traumatic events. Juvenile offenders have high rates of other mental health and behavioral disorders that have been associated with exposure to traumatic events.

Research has found that PTSD often occurs comorbidly with other mental health disorders, including substance abuse and mood disorders (Brady, 1997; Giaconia et al., 2000). Some have argued that these disorders may not be comorbid but a more complex reaction to traumatic events than the PTSD diagnosis captures (Van der Kolk, 2005). One study found that PTSD mediates the relationship between exposure to interpersonal trauma and other mental health problems, including anger, depression, anxiety, substance use, somatic complaints, and



suicidal ideation among juvenile offenders, especially female juvenile offenders (Kerig, et al., 2009). These studies support the theory that trauma plays a pivotal role in the development of behaviors that result in the youth becoming involved in the juvenile justice system (Ford, Chapman, Mack, & Pearson, 2006).

Children involved in the juvenile justice system are often diagnosed with disruptive behavior diagnoses (i.e. conduct disorder and oppositional defiant disorder). One study found that nearly 40% of male and female juvenile detainees met the criteria for a disruptive behavior disorder (Teplin, et al., 2002). These disorders have been associated with histories of traumatic exposure particularly trauma in which the child was victimized (Ford et al., 1999; Greenwald, 2002). Trauma exposure has also been linked to the development of antisocial behaviors in adolescents (Greenwald, 2002). Research examining disorders co-occurring with PTSD in juvenile offenders samples found conduct disorder to be strongly comorbid, with the onset of conduct disorder occurring at the same time or after the development of PTSD (Dixon, et al., 2005). Traumatic events in childhood may disrupt attachment and trust with caregivers, decrease a person's ability to empathize (James, 1989), increase a hostile attribution bias in the child, increase anger and violent emotions (Hartman & Burgess, 1993), influence a person to engage in risky behaviors (Hernandez, Lodico, & DiClemente, 1993), and result in a negative or hopeless view of their future (Fletcher, 1996; Terr, 1991), all of which can contribute to the development of a behavioral disorder such as conduct disorder and oppositional defiant disorder.

Other mental health and behavioral problems that have been found to be associated with trauma exposure in juvenile offenders include: Substance abuse (Crimmins, Cleary, Brownstein, Spunt, & Warley, 2000), depression and anxiety disorders (Abram, et al., 2007; Dixon, et al.,

2005), Attention-Deficit/Hyperactivity disorder (Abram, et al., 2007), psychotic disorders (Colins, et al., 2009), and dissociation (Carrion & Steiner, 2000).

It would seem that the previously mentioned complex trauma reactions may better encapsulate the trauma reactions found in juvenile offenders who have experienced childhood maltreatment and/or grief and loss, as these individuals often have significant interpersonal and environmental variables that influence the mental health reactions to such events.

### **Psychological Evaluations with Juvenile Offenders**

The juvenile justice system has an obligation to identify the mental health disorders present in youths who come in contact with the system because of three reasons: 1) custodial obligation, 2) due process obligation, and 3) public safety obligation (Grisso, Vincent, & Seagrave, 2005). Under custodial obligation, the adults in the juvenile justice system are the custodial guardians of the youths in their care, especially in detention where access to community services is restricted. Thus, caretakers are required to secure mental health services for these youths when mental health disorders are identified. Under due process obligation each youth involved in the juvenile justice system has the right to a fair trial in which they participate in their defense. Mental health disorders may interfere with the adolescent's ability to participate in their defense. Thus the juvenile justice system has an obligation to become aware of any mental health disorder that may interfere with the youth's ability to participate in their trial and take steps to assist the youth in regaining competency, if possible. The public safety obligation means that the juvenile justice system has an obligation to protect the public from harm, as well as provide the youths involved in the system with services to decrease the chance of future offending behavior and recidivism; this includes identifying and treating mental health disorders.

Typically, youths entering the juvenile justice system are subjected to a brief screening for mental health and behavioral disorders. Youths who are identified by professionals within the system as possibly having mental health disorders that warrant further investigation are referred for a psychological evaluation/assessment. This psychological evaluation is usually conducted by a psychologist, who utilizes a variety of tools including an in-depth clinical interview, various standardized psychological measures, and a review of the youth's records to make any diagnoses and treatment and placement recommendations. One such standardized psychological measure that has been frequently utilized with juvenile offenders is the Minnesota Multiphasic Personality Inventory – Adolescent Version (Archer, et al., 2006).

#### **MMPI-A.**

The MMPI-A (Butcher et al., 1992) was developed in response to the popularity of the MMPI, its adult predecessor, in assessing psychopathology in adolescents in addition to its target population of adults. Since the MMPI-A's development, it has become the most widely used self-report measure for adolescents (Archer & Newsome, 2000). In addition to its widespread popularity among clinicians in the mental health field, it is also very popular among forensic psychologists working with adolescents in the juvenile justice system (Archer, et al., 2006). Although the MMPI-A has clinical scales that measure psychopathology in adolescents, as well as scales to measure constructs such as proneness to substance abuse, it does not have a scale that measures mental health problems that could be related to trauma exposure, nor have profiles common to adolescents exposed to traumatic events, particularly childhood maltreatment, been identified.

### *History.*

As previously mentioned, the MMPI-A was developed from its predecessor, the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1943). The original MMPI was developed for use with adults to assess personality, with the specific goals of simplifying identification of mental health problems, when used in conjunction with the clinical interview, identifying symptoms that could be matched to a single disorder and a specific treatment, and as a measure that could be used repeatedly during the treatment process to measure changes in symptoms (Archer, 2005). A significant aim of the MMPI was that an individual's responses would produce a single elevation on a scale that would identify a diagnosis and treatment.

The MMPI was developed using the criterion keying approach to test construction. Thus, an original pool of test items was developed and administered to groups of individuals of interest (clients with various mental health diagnoses) and a control group of individuals without mental health difficulties. Items on which there was a significant difference in responding between the interest group and the control group were included on the scale. Usually the scale was named after whatever diagnosis the interest group had (i.e. the Depression scale). The resulting measure provided scores that indicated if the respondent answered in the clinical range (i.e. responded similarly to individuals with a certain mental health issue) or in the normative range (i.e. responded similarly to the control group). However, the MMPI did not fulfill its goal of being able to differentiate clinical disorders based on a single scale elevation, as it was discovered that clients with mental health disorders often responded in a manner that resulted in elevations on multiple scales. This shifted the purpose of the MMPI away from categorizing clients into groups, and towards describing the mental health and personality issues of an

individual, with broad interpretations made from the scores (Graham, 2000) . Additionally, the original MMPI utilized validity scales to assist the clinician in determining the validity of the client's responses, and in turn the interpretability of the results (Archer, 2005).

The MMPI has historically been used with adolescents, even though the lower age limit was established as 16 years old. A study examining the use of assessment measures with adolescents found the MMPI to be the most widely used objective assessment measure among practitioners working with this population (Archer, Maruish, Imhof, & Piotrowski, 1991). Of interest in the present study, many of the early uses of the MMPI with adolescents involved evaluating male and female juvenile offenders to examine clinical scale profiles compared to control groups, as well as investigate the validity of the Pd scale (Ball, 1962; Capwell, 1945a, 1945b; Hathaway & Monachesi, 1951, 1952, 1953, 1961, 1963; Monachesi, 1948, 1950). To facilitate the MMPI's use with adolescents, the Marks and Briggs adolescent norms were developed and published (Dahlstrom, Welsh, & Dahlstrom, 1972). However, there were still concerns regarding the usefulness of an assessment measure designed for and originally normed on adults in assessing adolescents. Thus, the MMPI-A was developed during the revising of the original MMPI.

The MMPI-A was created to assess adolescent psychopathology and areas of concern specific to adolescents. It is similar to the original MMPI and to its revision, the MMPI-2, in that it maintained the validity scales and the standard clinical scales. Scales were also added that focus on areas of particular interest with adolescents, such as the Immaturity scale (IMM) and the Alcohol/Drug Problem Proneness scale (PRO) (Archer, 2005). The MMPI-A also improved upon the MMPI by examining what items loaded onto what scales, such as the Mf and Si scales,

and deleting items that did not meaningfully contribute to a scale. This improved the validity of the measure and shortened its administration time.

***MMPI-A and MMPI-2 in evaluating trauma.***

The MMPI-2 has been used in research to identify profiles and subgroups among survivors of child sexual abuse. One study used a cluster analysis to examine differences in symptoms and mental health difficulties among survivors of child sexual abuse (Follette, Naugle, & Follette, 1997). This cluster analysis identified five subgroups of survivors, defined by profiles. The profile of Group 1 was characterized by symptoms of anger and hostility, with elevations of scales 6, 2, and 7 (Pa, D, and Pt scales). The profile of Group 2 was characterized by significant distress across the scales, with half of the scales reaching clinically significant elevations, with the highest elevations on scale 8 and 7 (Sc and Pt). The profile of Group 3 was characterized by a significant peak on scale 4 (Pd scale), which is usually associated with rule-breaking behavior. The profile of Group 4 was characterized by a high degree of psychiatric disturbance, or at least responses indicating such, with an extremely elevated F scale, and significant elevations of 8 out of 10 clinical scales. The profile of Group 5 was characterized by no elevations of content scales and seemingly little psychological symptoms identified by the MMPI-2. A more recent cluster analysis of MMPI-2 profiles produced by survivors of child sexual abuse verified that the profiles categorize into five clusters (Elhai, Flitter, Gold, & Sellers, 2001). This study found clusters that resembled three of the five groups identified by Follette and colleagues' (1997). However, two of the clusters, while sharing some similarities in elevations, could not be considered replications of Follette and colleagues' findings. Interestingly, Elhai and colleagues' Cluster 1 profile, which was similar to Follette and colleagues' Group 4 (both contained individuals who had very high scores on the F scale), closely resembles the

“Women’s Fake Bad” profile identified by Graham, Watts, and Timbrook (1991), suggesting the need for further investigation into these “Faking Bad” profiles when there is a known history of childhood sexual abuse. These studies highlight the importance of examining the symptoms and complaints of trauma survivors, and recognizing that individuals who have experienced similar traumatic experiences do not always produce the same psychological reaction.

The MMPI-A has been used to lesser extent to evaluate the mental health consequences of trauma among adolescents. One study found that among detained adolescent males, those with PTSD had significantly higher elevations of Scales 4,6, and 8 than those without a PTSD diagnosis (Cashel, Ovaert, & Holliman, 2000). Additionally, this study evaluated the utility of the MMPI-2 PK scale to detect PTSD in this population and found significant differences in the scores obtained from youths diagnosed with PTSD and youths without a PTSD diagnosis, lending support for the utility of this scale with this population.

### **Summary**

As just reviewed, trauma in childhood, particularly forms of childhood maltreatment and events that elicit a grief and loss reaction, have been found to be associated with significant mental health difficulties and increased involvement in the justice system. Youths involved in the juvenile justice system have a high incidence of experiencing trauma, particularly maltreatment and grief and loss. Youths involved in the juvenile justice system also have significantly higher rates of mental health disorders than community samples. Research suggests that experiences of trauma may be a causal factor in the mental and behavioral problems demonstrated in youths involved in the juvenile justice system. The MMPI-A is a commonly used assessment measure among forensic psychologists. It is often used in psychological evaluations to determine diagnosis and treatment recommendations for a youth involved in the

juvenile justice system. In order to better serve the juvenile offender population, the MMPI-A should be evaluated to determine if it has utility in identifying and describing juvenile offenders whose mental health and behavioral difficulties may be a consequence of trauma exposure. This study will examine the mental health consequences of childhood traumatic events, specifically types of childhood maltreatment and grief and loss, by the profiles produced in the MMPI-A in a sample of juvenile offenders. Additionally, item-level analysis will be conducted to determine if a scale can be developed from the current MMPI-A questions that assist in identifying juvenile offenders whose mental health and behavioral difficulties may be due, in part, to exposure to traumatic events and victimization.



## Chapter Three

### Method

It has been established that a significant amount of youths involved in the juvenile justice system have experienced childhood maltreatment and/or grief and loss and the mental health consequences of such events may have assisted in the development of the mental health and behavioral problems resulting in juvenile court involvement. As such, the MMPI-A, the most commonly used assessment measure among forensic psychologists working with this population, should be evaluated to determine if it has utility in identifying youths whose mental health and behavioral problems may be related to such traumatic events. This study examined the mental health consequences of childhood traumatic events, specifically types of childhood maltreatment and grief and loss, by the profiles and responses produced on the MMPI-A in a sample of juvenile offenders

### Participants

Psychological evaluations were examined for pertinent data for use in this study. The individuals who participated in these psychological evaluations were adolescents referred by the Department of Juvenile Justice located in a southeastern city of the United States to participate in a psychological evaluation to identify mental health disorders and treatment and/or placement recommendations. According to the most recent demographic information about the youths arrested in this county for 2009, 73% were African American, 13% Hispanic/Latino, and 11% White. Additionally, 40% of youths arrested in this county were female, 11% were under the age of 12, 52% were between the ages of 13 and 15, and 36% were 16 years old and up (Georgia

Department of Juvenile Justice"Georgia Department of Juvenile Justice ", 2009). In the referring county, juvenile arrests accounted for 18.5% of all arrests in this county in 2009. An economic description of the county is captured in the statistic that 69.5% of students attending public school were considered economically disadvantaged in the 2008-2009 school year. Also, 34.3% of children ages 0-17 lived below the poverty line in this county was in 2009 (Boatright, 2011).

The psychological evaluations were conducted by doctoral graduate students trained in psychological assessment or by licensed psychologists. The psychological evaluations consisted of a measure of cognitive ability, a measure of personality, an in-depth clinical interview with the youth, and a review of the youth's juvenile justice records. Cases were chosen for this study from the archival collection of psychological evaluations conducted from 1998 through 2010. Psychological evaluations to be included in the study were selected according to three criteria: 1) the subject of the evaluation was between the ages 14 and 18 years old (the age range for which the MMPI-A is normed for use), 2) the subject completed an MMPI-A, and 3) an in-depth clinical interview in which the topics of childhood maltreatment and grief and loss were specifically addressed. Psychological evaluations in which these topics were not specifically addressed were not included, as it is possible the youth experienced these events, but did not volunteer the information without prompting from the evaluator.

644 psychological evaluations were examined for inclusion in this study. 236 evaluations were excluded due to not administering an MMPI-A in the course of the evaluation or for the subject not being between the age ranges for which the MMPI-A is normed for use (14-18 years old). 75 evaluations were excluded due to not being able to code the clinical interview. 148 were excluded as the clinical interview did not identify if the evaluator explicitly inquired about trauma exposure. After reviewing the evaluations, 186 evaluations were

identified as meeting criteria for inclusion in this study. There were substantially more males than females in the final sample (male  $N = 145$ ; female  $N = 41$ ). The adolescent sample is ranged in age from 14 to 18, with the mean age being 15.3 years old and the median being 15.1 years old. The racial breakdown consisted mainly of African-American ( $N = 98$ ) and White ( $N = 68$ ) youths. There were also 16 Latino/a youths, 2 youths who identified as Biracial and 2 youths who identified as Asian. Charges ranged from status offenses ( $N = 35$ ) to drug charges ( $N = 21$ ) to crimes against property ( $N = 27$ ) and crimes against persons, including battery and aggravated assault ( $N = 39$ ). Cases were separated into two groups, Trauma History ( $N = 84$ ) and No Trauma History ( $N = 102$ ) based on whether the subject of the evaluation endorsed one of the five identified types of trauma or denied any trauma history. Within the trauma history group, the cases were further assigned to one of the five identified types of trauma: Physical Abuse ( $N = 16$ ), Sexual Abuse ( $N = 13$ ), Neglect ( $N = 4$ ), Grief and Loss ( $N = 34$ ), and Multiple Types of Trauma ( $N = 21$ ).

## **Instruments**

### **Minnesota Multiphasic Personality Inventory – Adolescent** (Butcher, et al., 1992).

The MMPI-A is a 478 true-false self-report measure of personality and psychopathology. It was normed against clinical and nonclinical populations, with the norming sample consisting of approximately 2,500 adolescents ranging in age from 14 to 18. The norm sample closely resembled the U.S. Census data, with 76% of the sample consisting of White adolescents, 12% Black adolescents, and the remaining 12% consisting of adolescents identified as Asian, Hispanic, Native American, and “Other” (Archer, 2005). It consists of seven validity scales, ten clinical scales, 15 content scales, and a variety of supplementary scales. It has demonstrated acceptable test-retest reliability and internal consistency, comparable with the MMPI-2 (Butcher,

et al., 1992). Test-retest correlations for the clinical scales over a one week period have a median  $r = .80$ . Concurrent validity of the MMPI-A has been examined with juvenile offenders. One study found elevations on MMPI-A were strongly correlated with counselor ratings of behavior and mental health problems in a sample of juvenile offenders (Toyer & Weed, 1998). Other studies have demonstrated concurrent and construct validity for the MMPI-A with juvenile offenders compared with the normative sample (Peña, Megargee, & Brody, 1996). Additionally, research has demonstrated discriminant validity between juvenile offenders and non-clinical populations (Archer, Bolinsky, Morton, & Farris, 2003; Morton, Farris, & Brenowitz, 2002). Research has also examined the factorial structure of the MMPI-A in the juvenile offender population and found the factors generated in a factor analysis closely resembled those produced for the normative sample and a clinical sample (Archer, Bolinsky, Morton, & Farris, 2002).

Due to significant minority representation in the juvenile justice system population, it is important to discuss the psychometrics of the MMPI-A with adolescents of color. While there is a paucity of research examining the validation of the MMPI-A with racial and ethnic minority adolescents, Archer and Krishnamurthy (2002) reviewed the existing literature and concluded that the standardized norms were appropriate for use with these populations. However, they acknowledged that since the body of research investigating the validity of the MMPI-A with adolescents of color is small, one should be conservative in interpreting the resulting MMPI-A profiles. One study compared the responses of a sample of Latino adolescents on the MMPI-A to the norming sample and found minimal differences that were mainly explained by socioeconomic and acculturation statuses (Negy, Leal-Puente, Trainor, & Carlson, 1997).

In the present study, the MMPI-A Validity and Clinical Scale scores were used as dependent variables. The validity scales include Scale F, which provides a measure of the

respondent's endorsement of infrequently endorsed items; Scale L, which provides a measure of the respondent's endorsement of items that deny common human failings; and Scale K, which provides a measure of the respondent's defensiveness. The clinical scales include (Archer, 2005):

- Scale 1 (Hs; Hypochondriasis); provides a measure of the respondent's endorsement of items related to bodily concerns and physical complaints.
- Scale 2 (D; Depression); provides a measure of the respondent's endorsement of items related to a lack of interest in activities, social withdrawal, and general dissatisfaction and/or apathy towards life.
- Scale 3 (Hy; Hysteria); provides a measure of the respondent's endorsement of items related to handling and experiencing stress somatically.
- Scale 4 (Pd; Psychopathic Deviate); provides a measure of the respondent's endorsement of items related to interpersonal conflict, problems with authority, lack of social connectedness, delinquency, and a lack of satisfaction with "everyday life".
- Scale 5 (Mf; Masculinity-Femininity); provides a measure of the respondent's endorsement of items related to endorsing traditionally masculine or feminine ideas and roles.
- Scale 6 (Pa; Paranoia); provides a measure of the respondent's endorsement of items related to classic psychotic symptoms, as well as items assessing sensitivity in interpersonal situations, cynicism, and rigidity of thinking.
- Scale 7 (Pt; Psychasthenia); provides a measure of the respondent's endorsement of items related to symptoms of anxiety and emotional distress.

- Scale 8 (Sc; Schizophrenia); provides a measure of the respondent's endorsement of items related to feelings of alienation and social withdrawal, as well as assess the classic symptoms of schizophrenia.
- Scale 9 (Ma; Mania); provides a measure of the respondent's endorsement of items related to symptoms of mania, including grandiosity, irritability, elevated mood and energy level.
- Scale 0 (Si; Social Introversion); provides a measure of the respondent's endorsement of items related to their style in interaction and level of comfort in social situations and relationships.

#### **Clinical Interview.**

The clinical interview was conducted by a trained doctoral student or licensed psychologist. The interview, as written up in the final report and notes made during the interview, were examined by this researcher for inclusion in this study. As previously mentioned, the topics of childhood maltreatment and grief and loss had to be explicitly endorsed or denied by the youth for inclusion in this study. Adolescent self-report of childhood maltreatment and/or grief and loss in interviews has been found to elicit disclosure of abuse four to six times higher than utilizing records from the local child protective service agency. Additionally, psychological adjustment has been found to be more strongly associated with self-report of abuse than with the local child protective service agency's determination of abuse (Everson et al., 2008). Therefore, utilizing youth self-report of childhood maltreatment and grief and loss experiences has a foundation in the literature to be a useful source of this information. The clinical interviews of the psychological evaluations selected for inclusion in the study were coded according to the childhood maltreatment and grief and loss experiences disclosed in the

interview. For the purposes of this study, each participant's maltreatment and grief and loss experiences were coded into one of six categories: 1) physical abuse (N = 16), 2) sexual abuse (N = 13), 3) neglect (N = 4), 4) grief and loss (N = 34), 5) multiple traumas (N = 21), and 6) denied any maltreatment and grief and loss experiences (N = 102). Based on this report or denial of a history of maltreatment and grief and loss, the evaluations were further classified into those who reported a history of maltreatment and grief and loss and those who denied such experiences. These groups will be referred to as "trauma history" (N = 84) and "no trauma history" (N = 102) in the analyses.

To verify accuracy of trauma group codings, an audit of 26 of cases (14% of the total sample) was conducted. Cases were randomly selected for inclusion in the audit and were recoded by a counseling psychology doctoral student. The codings produced by this student were compared with the original trauma group codings created by this researcher. There was 100% agreement among the codings, which suggests accuracy of the group separations.

### **Analyses**

To examine Hypothesis 1, a one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of experiencing trauma (trauma history vs. no trauma history) on 13 dependent variables (MMPI-A Validity Scales: F, L, and K; and MMPI-A Clinical Scales: 1 (Hs), 2 (D), 3 (Hy), 4 (Pd), 5 (Mf), 6 (Pa), 7 (Pt), 8 (Sc), 9 (Ma), and 0 (Si), and examine if there is an interaction between experiencing trauma and a participant's self-reported race (Black, White, Latino/a, Biracial, and Asian), and gender (male vs. female). However, due to the large difference between the male and female sample sizes (N = 145 and 41, respectively) and also to the small sample size of the Latino/a (N = 16), Biracial (N = 2), and Asian (N = 2) cases, Box's *M* was significant ( $p < .001$ ) in this analysis, indicating violations of the homogeneity of

variance-covariance matrix assumption. Therefore, gender was not included as an independent variable in this analysis. Also the Latino/a, Biracial, and Asian cases were not included in this analysis. Pillai-Bartlett trace  $V$  was utilized due to being a more robust test statistic in a MANOVA than the more commonly used Wilke's Lambda (Olson, 1979).

A descriptive discriminant analysis (DDA) was conducted to provide another statistical avenue to evaluate Hypothesis 1 and determine if MMPI-A scales accurately differentiate between the trauma and no trauma groups. It was utilized mainly to determine if the differences between the trauma and no trauma groups on the MMPI-A clinical scales could be used to correctly classify members of those groups. Additionally, Sherry (2006) identified several advantages to the DDA over the MANOVA, particularly in social sciences research. For the purposes of this study, it was identified as a useful statistical tool to determine the extent to which specific scales contributed to the identified differences between the trauma history group and the no trauma history group.

To examine Hypothesis 2, a one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of the four types of trauma (Physical Abuse, Sexual Abuse, Grief and Loss, and Multiple Types) on thirteen dependent variables (MMPI-A validity scales: F, L, and K; MMPI-A Clinical Scales: 1 [Hs], 2 [D], 3 [Hy], 4 [Pd], 5 [Mf], 6 [Pa], 7 [Pt], 8 [Sc], 9 [Ma], and 0 [Si]). The neglect group had to be excluded from this analysis due to having an inadequate sample size to make meaningful comparisons ( $N=4$ ). Again, Pillai-Bartlett trace  $V$  was utilized as the test statistic.

Due to the small sample size of females relative to the male sample size, separate MANOVAs for male and females were conducted to examine Hypothesis 3 and determine if there were mean differences along the thirteen dependent variables variables (MMPI-A validity



scales: F, L, and K; MMPI-A Clinical Scales: 1 [Hs], 2 [D], 3 [Hy], 4 [Pd], 5 [Mf], 6 [Pa], 7 [Pt], 8 [Sc], 9 [Ma], and 0 [Si]) with trauma history as the independent variable. Again Pillai-Bartlett trace  $V$  was utilized as the test statistic. Gender differences within the trauma groups were also examined, comparing male trauma group means on the MMPI-A scales with female trauma group means utilizing a MANOVA.

Individual MMPI-A items were explored to identify items on which there were group differences in responding (between the trauma history group and the no trauma history group). These items were then examined for utility in a subscale for the MMPI-A that identifies individuals as having mental health reactions to trauma, specifically childhood maltreatment and/or grief and loss. To this end,  $2 \times 2$  chi-square analyses were conducted with each of the 478 MMPI-A items (true or false responses), comparing the trauma exposure variable (trauma history or no trauma history) to determine if there was a relationship between trauma grouping and response on each item. Chi-Square analyses have been used previously in the development of subscales for the MMPI, and were appropriate for use with the sample size in the present study (Keane, et al., 1984). The items that were identified as having significantly different responses between groups at the  $p < .001$  level were entered into a logistic regression. The logistic regression was utilized to determine if these items together produced a model that was a strong predictor of trauma exposure group membership (trauma history or no trauma history). The logistic regression also identified if any of the individual items were strong predictors of group membership independent from the logistic regression model.

To provide qualitative information about the clinical elevations of the two groups (trauma history and no trauma history) a frequency distribution of the individual cases' two-point code-types on the MMPI-A Clinical scales was conducted. The two-point code types are an important

aspect of MMPI-A clinical interpretation. Identifying if there is a difference in the common two-point code-types between the two trauma groupings would provide useful clinical information to the practitioner.

### **Limitations**

The overall sample size was adequate for the statistical analyses conducted. However, a larger sample was needed to adequately compare all of the groups originally identified for inclusion in analyses. Specifically, the sample sizes for female juvenile offenders, Latino/a juvenile offenders, Asian juvenile offenders, Biracial juvenile offenders, and juvenile offenders with a history of experiencing neglect only were too small for inclusion in some statistical analyses.

As previously mentioned, self-report is a valid means of obtaining information about trauma history. However, it is possible that juvenile offenders with a history of trauma exposure denied this information during the psychological evaluation and were incorrectly placed in no trauma history group. This may have influenced the group means and diminished the differences in scores between the trauma history group and the no trauma history group.

## Chapter 4

### Group Differences between Trauma History Groups

To determine if there was an effect of experiencing trauma (trauma history,  $N = 74$ , no trauma history,  $N = 91$ ) on the thirteen dependent variables (MMPI-A validity scales: F, L, and K; MMPI-A Clinical Scales: 1 [Hs], 2 [D], 3 [Hy], 4 [Pd], 5 [Mf], 6 [Pa], 7 [Pt], 8 [Sc], 9 [Ma], and 0 [Si]), and to examine if there is an interaction between experiencing trauma and a participant's self-reported race (Black,  $N = 98$  and White,  $N = 68$ ) a One-Way Multivariate Analysis of Variance (MANOVA) was conducted. Box's  $M$  was not significant ( $p > .001$ ), indicating that there were no violations of the homogeneity of variance-covariance matrix assumption. MMPI-A scale means are presented in Table 1. The resulting profiles are plotted in Figure 1.

A significant main effect was found between the Trauma History and No Trauma History groups on the dependent variables, Pillai-Bartlett trace  $V = .188$ ,  $F(13, 149) = 2.650$ ,  $p = .002$ , partial  $\eta^2 = .188$ . Power to detect the effect was .982. A significant main effect was also found for self-reported race on the dependent variables, Pillai-Bartlett trace  $V = .192$ ,  $F(13, 149) = 2.724$ ,  $p = .002$ , partial  $\eta^2 = .192$ . Power to detect the effect was .985. There was not a significant interaction found between experiencing trauma and self-reported race on the dependent variables, Pillai-Bartlett trace  $V = .088$ ,  $F(13, 149) = 1.107$ ,  $p = .358$ , partial  $\eta^2 = .088$ . Power to detect the effect was .644. These statistics are presented in Table 2.

Due to the significant overall main effect of experiencing trauma on the dependent variables, the univariate main effects were examined. Six of the analyses violated Levene's Test

of Equality of Error Variances ( $p < .05$ ). Due to this, a more conservative alpha was adopted ( $p < .025$ ) (Tabachnick & Fidell, 1996). Also, Bonferroni's Correction was utilized to correct for the multiple analyses conducted simultaneously and applied to the alpha to identify significance ( $0.025/13 = p < .0019$ ).

Significant univariate main effects for experiencing trauma were found for nine of the thirteen dependent variables. On Validity Scale F, examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 161) = 17.648, p < .001$ , partial  $\eta^2 = .099$  observed power = .987. On Clinical Scale 1 (Hs), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 22.125, p < .001$ , partial  $\eta^2 = .121$ , observed power = .997. On Clinical Scale 2 (D), examination of the group means indicated the trauma group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 17.543, p < .001$ , partial  $\eta^2 = .098$ , observed power = .986. On Clinical Scale 3 (Hy), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 11.379, p = .001$ , partial  $\eta^2 = .066$ , observed power = .918. On Clinical Scale 4 (Pd), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 13.001, p < .001$ , partial  $\eta^2 = .075$ , observed power = .948. On Clinical Scale 6 (Pa), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 17.531, p < .001$ , partial  $\eta^2 = .098$ , observed power = .986. On Clinical Scale 7 (Pt), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 12.630, p < .001$ , partial  $\eta^2 = .073$ , observed power = .942.

On Clinical Scale 8 (Sc), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 18.525, p < .001$ , partial  $\eta^2 = .103$ , observed power = .990. On Clinical Scale 0 (Si), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1,161) = 15.554, p < .001$ , partial  $\eta^2 = .088$ , observed power = .975. These statistics are presented in Table 3. Based on these statistical findings, Hypothesis 1 is supported: juvenile offenders with a history of trauma have higher elevations on the validity and clinical scales of the MMPI-A.

To investigate the overall main effect for self-reported race, the univariate main effects were examined for the impact of self-reported race on each dependent variable. Still utilizing the Bonferonni Correction ( $0.025/13 = p < .0019$ ), a significant univariate main effect was found for one dependent variable, Clinical Scale 3 (Hy),  $F(1, 161) = 19.865, p < .001$ , partial  $\eta^2 = .110$ , observed power = .993. Examination of the group means identified that on Scale 3 (Hy), the White group had a significantly higher group mean ( $M = 57.82; SD = 10.548$ ) than the Black group ( $M = 50.41; SD = 10.080$ ). However, the other 12 dependent variables did not have significant univariate effects for self-reported race. These statistics are presented in Table 3.

There was not a significant interaction between self-reported race and experiencing trauma. However, the observed power for that multivariate test was low. Although there was not a significant interaction between self-reported race and experiencing trauma, examination of the Estimated Marginal Means for the trauma history and no trauma history groups, separated by self-reported race (Black and White) revealed important information for clinical interpretation. On seven of the nine scales that were identified as having clinically significant differences in group means between the trauma history and no trauma history groups, the group means for

Whites in the trauma history group fell in the “Marginally elevated” (Scores between 60-65; Scales F, 1 (Hs), 2 (D), 3 (Hy), 6 (Pa), 8 (Sc)) or “Clinically elevated” (Scores 65 and above; Scale 4 [Pd]) ranges for MMPI-A interpretation, while only one group mean for Blacks fell in the “Marginally elevated” range, and that was for the no trauma history group. These means can be found in Table 1.

### **Group Differences between Types of Trauma**

Due to the overall main effect found for trauma experienced on the MMPI-A validity and clinical scales, a one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of the four types of trauma (Physical Abuse, Sexual Abuse, Grief and Loss, and Multiple Types) on thirteen dependent variables (MMPI-A validity scales: F, L, and K; MMPI-A Clinical Scales: 1 [Hs], 2 [D], 3 [Hy], 4 [Pd], 5 [Mf], 6 [Pa], 7 [Pt], 8 [Sc], 9 [Ma], and 0 [Si]; means and standard deviations are presented in Table 4). Due to the small sample size ( $N = 4$ ), the Neglect only trauma group was not included in the analyses.

A nonsignificant Box's  $M$  ( $p > 0.001$ ), indicated that the homogeneity of variance-covariance matrix assumption was not violated. No univariate or multivariate outliers were evident. There were no significant differences found between the trauma groups on the dependent variables, Pillai-Bartlett trace  $V = .354$ ,  $F(39,210) = .721$ ,  $p = .888$ . Therefore, no additional statistics were calculated to examine differences among the trauma groups.

Hypothesis 2 was not supported as there were no significant differences between the separate trauma groups on the MMPI-A scales of interest.

### **Group Differences between Genders**

Due to the large difference in sample sizes between male and female evaluations included in the study, this variable was not included in the MANOVA with the independent variables of

trauma exposure and self-reported race. The sample size of female juvenile offenders was not large enough to make statistically sound comparisons with the sample of male juvenile offenders. Thus, separate MANOVAs for male and females were conducted to determine if there were mean differences along the thirteen dependent variables (MMPI-A validity scales: F, L, and K; MMPI-A Clinical Scales: 1 (Hs), 2 (D), 3 (Hy), 4 (Pd), 5 (Mf), 6 (Pa), 7 (Pt), 8 (Sc), 9 (Ma), and 0 (Si)) with trauma history as the independent variable. In order to identify if self-reported race should be included as an independent variable or if cases from all racial groups (Black, White, Latino/a, Asian, and Biracial) in these separate analyses, MANOVAs were conducted including self-reported race (Black and White groups only due to sample size) as an independent variable along with trauma history for both males and females. These analyses determined there was not a significant interaction effect between self-reported race and trauma experience group for males,  $F(13,113) = .935, p = .520, \text{partial } \eta^2 = .097, \text{observed power} = .975405$  or females,  $F(13,20) = .832, p = .626, \text{partial } \eta^2 = .351, \text{observed power} = .329$ . Therefore, self-reported race was not included as an independent variable in the present analyses and cases from all racial groups were included (Black, White, Latino/a, Asian, and Biracial). A One-Way MANOVA was conducted to determine if there was a difference between the means on the thirteen MMPI-A dependent variables of interest for males with trauma history ( $N = 55$ ) and males with no trauma history ( $N = 89$ ). A nonsignificant Box's  $M$  ( $p > 0.001$ ), indicated that the homogeneity of variance-covariance matrix assumption was not violated. No univariate or multivariate outliers were evident. A significant difference was found between the trauma group on the dependent variables, Pillai-Bartlett trace  $V = .208, F(13,130) = 2.634, p = .003, \text{partial } \eta^2 = .208, \text{observed power} = .980$ .

Due to the significant overall main effect of experiencing trauma on the dependent variables, the univariate main effects were examined. Three of the analyses violated Levene's Test of Equality of Error Variances ( $p < .05$ ). Due to this, a more conservative alpha was again adopted ( $p < .025$ ) (Tabachnick & Fidell, 1996). Also, Bonferroni's Correction was utilized to correct for the multiple analyses conducted simultaneously and applied to the alpha to identify significance ( $0.025/13 = p < .0019$ ).

For males, significant univariate main effects for the trauma variable were found for seven of the thirteen dependent variables. On Validity Scale F, examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 16.976, p < .001, \text{partial } \eta^2 = .107, \text{observed power} = .984$ . On Clinical Scale 1 (Hs), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 19.102, p < .001, \text{partial } \eta^2 = .119, \text{observed power} = .991$ . On Clinical Scale 2 (D), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 11.406, p = .001, \text{partial } \eta^2 = .074, \text{observed power} = .918$ . On Clinical Scale 6 (Pa), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 20.344, p < .001, \text{partial } \eta^2 = .125, \text{observed power} = .994$ . On Clinical Scale 7 (Pt), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 14.920, p < .001, \text{partial } \eta^2 = .095, \text{observed power} = .970$ . On Clinical Scale 8 (Sc), examination of the group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 20.071, p < .001, \text{partial } \eta^2 = .124, \text{observed power} = .994$ . And on Clinical Scale 0 (Si), examination of the



group means indicated the trauma history group had a significantly higher group mean than the no trauma history group,  $F(1, 142) = 18.396, p < .001$ , partial  $\eta^2 = .115$  observed power = .989. This information is presented in Table 5. Means and Standard deviations for both groups are presented in Table 6.

A One-Way MANOVA was conducted to determine if there was a difference between the means on the thirteen MMPI-A dependent variables of interest for females with trauma history and females with no trauma history. Box's  $M$  was not able to be calculated due to the sample size of the female trauma history group being less than the number of dependent variables. There was not a significant main effect for trauma group, Pillai-Bartlett trace  $V = .400, F(13, 27) = 1.387, p = .229$ . This indicates that, for females, there were not significant differences in the group means between the trauma history group and no trauma history group. Means and standard deviations for both groups are presented in Table 6.

A MANOVA was conducted comparing males in the trauma group ( $N = 55$ ) with females in the trauma group ( $N = 29$ ) to determine if there are gender differences among the trauma group scale scores on the MMPI-A validity and clinical scales. Analyses were run including all self-reported racial groups and also, leaving out the Latino/a, Asian, and Biracial cases to determine if including these groups would impact the statistics. It was determined that there were no significant changes in statistics between these analyses. Therefore, it was decided to include all cases in this MANOVA. A nonsignificant Box's  $M$  ( $p > 0.001$ ), indicated that the homogeneity of variance-covariance matrix assumption was not violated. No univariate or multivariate outliers were evident. A significant difference was found between the trauma groups on the dependent variables, Pillai-Bartlett trace  $V = .492, F(13, 70) = 5.207, p < .001$ , partial  $\eta^2 = .492$ , observed power = 1.0. Examination of the univariate effects identified only

one significant main effect, for Scale 5 (Mf),  $F(1,82) = 38.053, p < .001$ , partial  $\eta^2 = .317$ , observed power = 1.00. Scale 5 is a measure of a participants' endorsement of masculine or feminine behaviors and stereotypic patterns of thinking. It would be expected that there are significant gender differences on this scale. There were no other scales that identified a significant difference between responses from male and females in the trauma group. Therefore Hypothesis 3 is not supported as males and females from the trauma group did not differ significantly in their scale elevations on the MMPI-A.

### **Classification Based on MMPI-A Validity and Clinical Scale Scores**

A descriptive discriminant analysis (DDA) was conducted comparing the trauma and no trauma groups ( $N = 84, 101$ ) on the MMPI-A Validity and Clinical scales, excluding F1 and F2 due to their high correlation with Validity Scale F. The assumptions of the DDA allowed for the inclusion of Latino, Biracial, and Asian cases excluded from the MANOVA when testing for group differences between the trauma and no trauma groups. Table 7 presents the means and standard deviations for both groups on these variables. In examining the canonical discriminant functions, there was a moderate canonical correlation ( $R_c = .407$ ) on Function 1 with an effect size of  $R_c^2 = .165$ . This indicates that at least some of the dependent variables account for 16% of the variance between the trauma history and no trauma history groups. The full model test of Function 1 was statistically significant, Wilke's Lambda = .835,  $p = .002$ .

As this analysis identified that the thirteen scales are related to the trauma grouping and explain approximately 16% of the variance between the groups, the coefficients in the composite variable were inspected to determine which variables are contributing to the composite's ability to discriminate between the groups. The structural coefficients were examined to determine if any of the thirteen variables did not contribute significantly to the discriminant function (i.e. had

a structural coefficient  $< .30$ ; Hair, Anderson, Tatham, and Black, 1998). Scales K ( $r_s = -.220$ ), L ( $r_s = -.148$ ), and 9 (Ma;  $r_s = .176$ ), were identified as not contributing meaningfully to the discriminant function and were dropped from the analysis. Another DDA was conducted to examine the discriminating power of the 10 independent variables identified as contributing significantly in predicting group membership. Examination of the discriminant function identified that there remained a moderate canonical correlation, ( $R_c = .393$ ), with an effect size of  $R^2_c = .154$ . This revised model supports that discarding the three noncontributing independent variables did not alter the amount of variance explained between the two trauma groups significantly, as this model accounts for approximately 15% of the variance between the trauma history and no trauma history groups. After discarding the three noncontributing scales, the full model test remained statistically significant, Wilks's lambda = .846;  $\chi^2 = 29.801$ ,  $p = .001$ ; canonical correlation = .393. A nonsignificant Box's  $M$  ( $p > 0.001$ ), indicated that the homogeneity of variance-covariance matrix assumption was not violated. Therefore the Structural Coefficients were examined to determine the predictive contributions of the ten independent variables (Table 8 presents these coefficients). The structural coefficients identified Scales 8 (Sc;  $r_s = .782$ ), 1 (Hs;  $r_s = .781$ ), 6 (Pa;  $r_s = .759$ ), F ( $r_s = .722$ ), 0 (Si;  $r_s = .704$ ), 4 (Pd;  $r_s = .690$ ), 7 (Pt;  $r_s = .684$ ), 2 (D;  $r_s = .671$ ), 5 (Mf;  $r_s = .567$ ), and 3 (Hy;  $r_s = .550$ ) significantly contribute to the differences between the trauma and no trauma groups.

The group centroids identified that the trauma history group (.466) had higher group means than the no trauma history group (-.387) on scales 8 (Sc), 1 (Hs), 6 (Pa), F, 0 (Si), 4 (Pd), 7 (Pt), 2 (D), 5 (Mf), and 3 (Hy).

Based on this model, the DDA was able to classify 62.2% of the original cases into the correct group using the leave-one-out classification (trauma or no trauma; presented in Table 9).

Examination of this classification reveals that the model worked similarly well at categorizing the trauma history group (61.9% correctly placed) and the no trauma history group (62.4% correctly placed). For this analysis, the rate of chance was calculated with the proportional by chance accuracy rate (Hosmer & Lemeshow, 2000), computed by summing the squared percentage of cases in each group defined by the dependent variable (trauma and no trauma;  $0.4524^2 + 0.546^2 = 0.506$ ). The benchmark used to characterize this model as useful in predicting group membership is a 25% improvement in the rate of accuracy achieved by chance alone. Therefore, the proportional by chance accuracy criteria is therefore 63.25% ( $1.25 \times 50.6\% = 63.25\%$ ). As this DDA correctly classified 62.2% of cases, this model is not considered a useful predictor of trauma group membership.

### **Identifying Items to Make Up a Trauma Scale**

In order to identify individual items that load for cases with trauma exposure,  $2 \times 2$  chi-square analyses were conducted with each of the 478 MMPI-A items (true or false responses) with the trauma exposure variable (trauma history and no trauma history) to determine if there was a relationship between trauma grouping and response on each item. These analyses yielded statistically significant results at  $p \leq .001$  for the following items: 2, 25, 27, 34, 41, 46, 158, 165, 177, 259, 270, 281, 296, 302, 369, 388, 443 (see Table 10 for item content). These results indicate that for these items, there was a relationship between trauma grouping and response.

To further examine the utility of MMPI-A item in developing a scale to identify individuals with a history of maltreatment and grief and loss, logistic regression analyses were conducted. The 17 items identified by the Chi-Square analyses as having significantly different loadings by the members of the two groups were utilized in this analysis. Since logistic regression analyses are sensitive to high correlations among predictor variables, the 17 identified

MMPI-A items were initially screened for multicollinear relationships. These statistics were in acceptable ranges, indicating there was not multicollinearity among the items. All 17 items were therefore included in the logistic regression. The logistic regression was conducted to determine if this set of items are strong predictors of trauma group membership. Logistic regression of these 17 items identified that the overall model was a relatively good predictor of trauma group membership (-2 log likelihood = 174.215, Chi Square = 54.040,  $p = .000$ ). This supports that there is a relationship between the dependent variable (trauma group membership) and the independent variables (the 17 MMPI-A items). The Pearson Goodness-of-fit test identified that the model entered was not statistically different from the hypothetical model ( $p = .513$ ). This provides support that these 17 items have predictive power of trauma group membership.

Overall, this model classified 75.8% of cases into the correct trauma group; correctly classifying 65.5% (55 out of 84) of cases in the trauma history group and 84.3% (86 out of 102) of cases in the no trauma history group (presented in Table 11). To determine the utility of this model in classification, the classification accuracy of this model was calculated. To consider this model as useful in classifying trauma exposure, it would need to provide a 25% improvement over the rate of accuracy expected by chance alone. For this analysis, the rate of chance was calculated with the proportional by chance accuracy rate, computed by summing the squared percentage of cases in each group defined by the dependent variable (trauma and no trauma;  $0.452^2 + 0.548^2 = 0.504$ ). The proportional by chance accuracy criteria is therefore 63% ( $1.25 \times 50.4\% = 63\%$ ).

The classification accuracy rate was 75.8%, which was greater than the proportional by chance accuracy criteria of 63%. Therefore, it is determined that this logistic regression model is a useful model in predicting group membership.

Examination of the relationships between individual independent variables (the seventeen MMPI-A items) and the dependent variable (trauma grouping) revealed only one item, Item 2 independently had a significant relationship with trauma grouping ( $-2 \log \text{likelihood} = 178.181$ ,  $\text{Chi Square} = 3.967$ ,  $p = .046$ ). However, although Item 2 was significantly related to trauma grouping, it was not statistically significant in differentiating between the two groups outside of the logistical model,  $\text{Wald} = 3.698$ ,  $p = .054$ . The other sixteen items were not significantly related to the trauma grouping and were not significant in predicting group membership outside of the logistical model (presented in Table 12). The results of this logistic regression partially support Hypothesis 4. Items were identified that, as a group, successfully distinguish the trauma history group from the no trauma history group. However, this analysis demonstrates that these items, individually, do not have predictive power of distinguishing between the two groups.

### **Two-Point Code-Type Frequencies**

A two-point code-type frequency distribution was tabulated to compare the two-point codes of profiles in the trauma history group with profiles in the no trauma history group. This tabulation is presented in Table 13. Code-types were nonrestricted and determined by the two highest Clinical Scale elevations. Twenty cases that were not easily classified into a two-point code type were not included in this frequency distribution. This reduced the cases in the trauma history group from 84 to 74 and the cases in the no trauma history group from 102 to 92. The most frequently occurring code-type for both groups was 2-4/4-2 (16% of the trauma history group and 17% of the no trauma group). The next two most frequently occurring code-types for the trauma history group were 4-6/6-4 (11% of the trauma history group) and 2-3/3-2 (8% of the trauma history group). For the no trauma history group, the next two most frequently occurring code-types were 2-3/3-2 (10% of the no trauma group) and 2-9/9-2 (9% of the no trauma group).

Table 1  
Mean Scores and Standard Deviations for MMPI-A Validity and Clinical Scales as a Function of Trauma Exposure and Race

MMPI-A Scale	Black (N = 98)				White (N = 67)				Overall (N = 165)			
	Trauma (N = 40)		No Trauma (N = 58)		Trauma (N = 34)		No Trauma (N = 33)		Trauma (N = 74)		No Trauma (N = 91)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
F	58.08	12.613	54.45	10.578	62.82	13.886	50.79	9.688	60.26	13.336	53.12	10.362
L	59.18	13.439	61.38	11.461	56.91	13.953	55.21	11.285	58.14	13.630	59.14	11.720
K	52.98	13.079	53.43	9.972	52.88	11.703	56.52	11.344	52.93	12.381	54.55	10.534
1	54.10	10.260	49.64	7.592	61.82	17.292	49.03	11.171	57.65	14.367	49.42	8.998
2	58.83	8.439	55.47	7.359	64.24	13.578	54.94	8.782	61.31	11.347	55.27	7.860
3	52.13	10.735	49.22	9.516	61.68	11.713	53.85	7.480	56.51	12.106	50.90	9.069
4	59.45	9.018	55.59	8.199	65.35	13.273	57.45	11.161	62.16	11.483	56.26	9.364
5	47.18	10.815	45.40	9.588	51.41	11.450	43.85	9.179	49.12	11.237	44.84	9.420
6	58.35	12.536	51.76	10.883	62.00	16.356	52.09	9.382	60.03	14.431	51.88	10.312
7	52.50	12.270	48.93	9.283	56.82	15.707	46.73	11.756	54.59	14.024	48.13	10.240
8	55.20	12.429	50.33	11.052	61.00	17.476	47.52	13.300	57.86	15.134	49.31	11.921
9	54.15	10.497	55.07	10.755	54.65	13.003	49.91	10.800	54.38	11.635	53.20	10.998
0	52.38	8.217	48.71	7.847	53.03	10.925	45.18	10.279	52.68	9.494	47.43	8.915

Table 2  
Multivariate Analyses of Variance F Ratios for Trauma Group x Race

	Pillai's Trace V	F	Partial Eta Squared	Observed Power
Trauma Grouping	0.188	2.65**	0.188	0.982
Race	0.192	2.724**	0.192	0.985
Trauma Grouping*Race	0.088	1.107	0.088	0.644

Note. Multivariate  $F$  ratios were generated from Pillai's statistic.

Multivariate  $df = 13, 149$

\*\* $p < .01$

Table 3  
Mean Group Differences for Trauma and Race

	ANOVA			
	Trauma Group		Race	
	$F(1,161)$	Partial Eta Squared	$F(1,161)$	Partial Eta Squared
F	17.648***	0.099	0.085	0.001
L	0.016	0.000	4.484	0.027
K	1.259	0.008	0.674	0.004
1 (Hs)	22.125***	0.121	3.763	0.023
2 (D)	17.543***	0.098	2.613	0.016
3 (Hy)	11.379***	0.066	19.865***	0.110
4 (Pd)	13.001***	0.075	5.675	0.034
5 (Mf)	8.191	0.048	0.679	0.004
6 (Pa)	17.531***	0.098	1.021	0.006
7 (Pt)	12.630***	0.073	0.304	0.002
8 (Sc)	18.525***	0.103	0.491	0.003
9 (Ma)	1.140	0.007	1.699	0.010
0 (Si)	15.554***	0.088	0.967	0.006

Note. Bonferonni Correction ( $0.025/13 = p < .0019$ )

\*\*  $p < .0019$

\*\*\*  $p < .001$

Table 4  
Mean Scores and Standard Deviations for MMPI-A Validity and Clinical Scales as a Function of Type of Trauma Exposure

MMPI-A Scale	Physical Abuse (N = 16)		Sexual Abuse (N = 13)		Grief and Loss (N = 34)		Multiple Victimization (N = 21)	
	M	SD	M	SD	M	SD	M	SD
F	59.00	14.574	63.62	16.480	58.91	13.679	61.33	11.311
L	59.63	14.619	59.38	15.481	59.09	13.192	55.86	14.266
K	54.00	12.463	52.62	7.730	53.79	13.564	51.95	12.588
1 (Hs)	58.31	15.270	59.77	13.621	54.85	11.675	59.48	17.535
2 (D)	60.50	14.574	61.85	10.511	60.15	8.907	62.38	12.994
3 (Hy)	56.50	13.570	56.77	10.481	54.50	12.889	59.00	12.133
4 (Pd)	62.00	10.912	61.62	13.950	60.26	10.788	66.29	13.070
5 (Mf)	48.63	10.321	55.08	13.829	45.41	9.664	53.67	10.961
6 (Pa)	59.75	17.453	60.85	17.911	58.85	13.226	61.14	12.559
7 (Pt)	54.56	13.416	58.77	15.243	52.44	11.937	55.76	15.713
8 (Sc)	56.25	15.631	61.23	17.810	55.56	13.301	60.43	15.857
9 (Ma)	56.06	12.450	57.69	12.970	53.06	11.311	52.52	10.787
0 (Si)	52.06	10.823	53.69	10.789	53.44	8.631	51.95	10.274

Table 5  
Mean Group Differences for Males Classified into Trauma History and No Trauma History

	ANOVA	
	<u>F (1,161)</u>	<u>Trauma Group Partial Eta Squared</u>
F	16.976***	0.107
L	1.076	0.008
K	2.498	0.017
1 (Hs)	19.102***	0.119
2 (D)	11.406**	0.074
3 (Hy)	7.869	0.053
4 (Pd)	7.085	0.048
5 (Mf)	1.362	0.009
6 (Pa)	20.344***	0.125
7 (Pt)	14.920***	0.095
8 (Sc)	20.071***	0.124
9 (Ma)	0.851	0.006
0 (Si)	18.396***	0.115

Note. Bonferonni Correction (0.025/13 =  $p < .0019$ )

\*\*  $p < .0019$

\*\*\*  $p < .001$



Table 6  
Mean Scores and Standard Deviations for MMPI-A Validity and Clinical Scales as a Function of Trauma Exposure and Gender

MMPI-A Scale	Males (N = 124)				Females (N = 41)			
	Trauma (N = 55)		No Trauma (N = 89)		Trauma (N = 29)		No Trauma (N = 12)	
	M	SD	M	SD	M	SD	M	SD
F	60.02	13.655	51.99	9.690	60.72	13.833	59.83	12.268
L	57.76	11.961	59.92	12.225	59.69	12.268	61.75	12.700
K	53.18	11.935	56.19	10.556	53.21	12.893	49.67	9.792
1 (Hs)	58.15	13.918	49.56	9.628	56.07	14.911	49.58	7.379
2 (D)	61.56	11.815	55.97	8.063	60.03	10.356	52.42	5.961
3 (Hy)	56.56	11.234	51.88	8.701	55.97	14.579	46.83	12.648
4 (Pd)	60.49	10.218	56.08	9.309	65.76	14.262	56.33	8.659
5 (Mf)	44.96	9.592	43.16	8.660	58.34	9.178	55.08	8.533
6 (Pa)	60.53	14.645	51.12	10.335	58.72	14.372	57.42	9.385
7 (Pt)	54.78	13.320	47.06	10.514	54.41	14.586	51.92	9.643
8 (Sc)	57.40	14.505	47.79	11.111	58.52	16.324	57.08	13.222
9 (Ma)	53.67	11.124	51.97	10.570	55.24	12.651	56.17	11.877
0 (Si)	53.38	9.507	46.71	8.795	51.83	10.079	52.08	6.417

Table 7  
Mean Scores and Standard Deviations for MMPI-A Validity and Clinical Scales as a Function of Trauma, Including all Cases

MMPI-A Scale	Trauma History (N = 84)		No Trauma History (N = 101)	
	M	SD	M	SD
F	60.26	13.637	52.92	10.281
L	58.43	13.921	60.14	12.232
K	53.19	12.197	55.42	10.635
1 (Hs)	57.43	14.214	49.56	9.358
2 (D)	61.04	11.293	55.54	7.903
3 (Hy)	56.36	12.405	51.28	9.322
4 (Pd)	62.31	11.954	56.11	9.193
5 (Mf)	49.58	11.368	44.57	9.436
6 (Pa)	59.90	14.490	51.87	10.386
7 (Pt)	54.65	13.684	47.63	10.489
8 (Sc)	57.79	15.069	48.89	11.705
9 (Ma)	54.21	11.622	52.47	10.756
0 (Si)	52.85	9.676	47.35	8.698

Table 8  
Correlations Between Discriminating Variables and Discriminant Functions (Function Structure Matrix)

Variable	Function 1
8 (Sc)	0.782
1 (Hs)	0.781
6 (Pa)	0.759
F	0.722
0 (Si)	0.704
4 (Pd)	0.690
7 (Pt)	0.684
2 (D)	0.671
5 (Mf)	0.567
3 (Hy)	0.550

Table 9  
Classification Analysis for Trauma Group

Actual group membership	Overall n	Predicted Group Membership			
		Trauma History		No Trauma History	
		n	%	n	%
Trauma History	84	52	61.9	32	38.1
No Trauma History	101	38	37.6	63	62.4

Note. Overall percentage of correctly classified cases = 62.2%

Table 10  
MMPI-A Item content identified as distinguishing between trauma history and no trauma history groups in the logistic regression

Item	Content	Critical direction for trauma history	% in keyed direction trauma history group	% in keyed direction no trauma history group	Traditional Keyed Direction and Scale loading
2	I have a good appetite.	False	26	5	False - Scales 1,2,3
25	I am bothered by an upset stomach several times a week.	True	31	12	True - Scales 1, hea
27	I shrink from facing a crisis or difficulty.	True	27	8	True - Scales 0, las, trt
34	At times I feel like smashing things.	True	62	38	True - ang, R
41	Once a week or oftener I suddenly feel hot all over, for no real reason.	True	43	20	True - Scales, 3, 8, hea
46	I am a very sociable person.	False	33	13	False - Sales 2, 0 sod, MAC-R
158	My memory seems to be alright.	False	39	15	Scales 2, 7, 8
165	I frequently notice my hand shakes when I try to do something.	True	46	24	True - Scale 3, MAC-R
177	I sometimes think about killing myself.	True	25	8	True - dep, MAC-R
259	Even when I am with people I feel lonely much of the time.	True	46	21	True - Scales 4, 7, 8, dep, A
270	I am easily embarrassed.	True	45	23	True - Scales 7, 0
281	I feel anxiety about something or someone almost all the time	True	48	25	True - Scales 7, anx, A
296	I have strange and peculiar thoughts.	True	49	26	True - Scales 7, 8, biz
302	The things that some of my family have done have frightened me.	True	43	21	True - Scales 8, fam
369	I feel unable to tell anyone all about myself.	True	54	30	True - Scales aln, trt, A
388	I am often sorry because I am so irritable and grouchy.	True	56	31	True - Scale ang
443	I have missed a lot of school in my life because of sickness.	True	33	14	True - Scaes hea, sch

Table 11  
Classification Analysis for Trauma Group Based on 17 MMPI-A Items

Actual group membership	Overall n	Predicted Group Membership			
		Trauma History		No Trauma History	
		n	%	n	%
Trauma History	84	55	65.5	29	34.5
No Trauma History	102	16	15.7	86	84.3

Note. Overall percentage of correctly classified cases = 75.8%

Table 12  
 Summary of Logistic Regression Analysis Predicting Trauma Group Membership

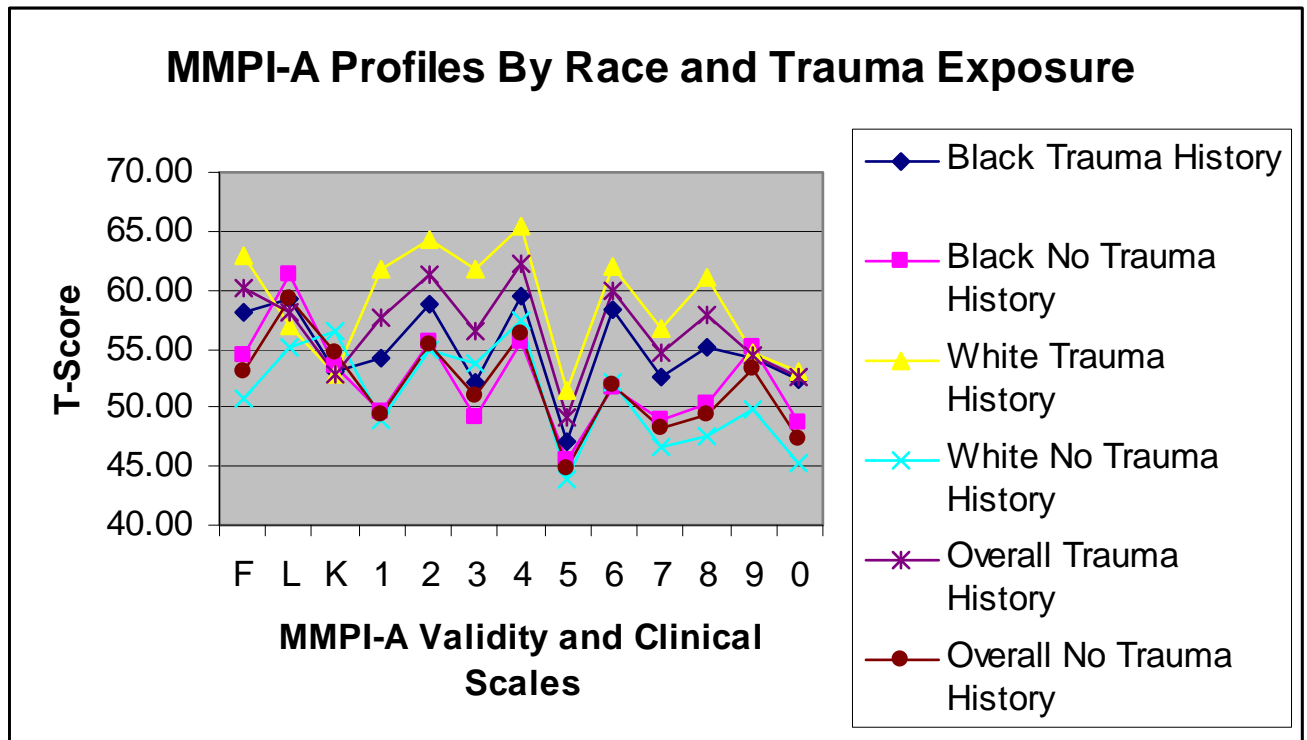
<u>Predictor</u>	<u><math>\beta</math></u>	<u>SE</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>
Item 2	1.205	0.627	3.336	3.698
Item 25	-0.463	0.479	0.629	0.936
Item 27	-0.590	0.541	0.554	1.190
Item 34	-0.169	0.377	0.844	0.202
Item 41	-0.039	0.440	0.962	0.008
Item 46	0.648	0.463	1.911	1.955
Item 158	0.419	0.439	1.520	0.907
Item 165	-0.363	0.433	0.695	0.703
Item 177	-0.299	0.563	0.741	0.283
Item 259	-0.047	0.443	0.954	0.011
Item 270	-0.450	0.410	0.637	1.207
Item 281	0.030	0.420	1.031	0.005
Item 296	-0.301	0.416	0.740	0.523
Item 302	-0.357	0.417	0.700	0.733
Item 369	-0.136	0.399	0.873	0.117
Item 388	-0.422	0.397	0.656	1.133
Item 443	-0.531	0.445	0.588	1.421

\* $p < .05$

Table 13  
 MMPI-A Two-Point Code Frequencies for Trauma History and No Trauma History Groups

Two-Point Code Type	Frequencies			
	Trauma History (N = 74)		No Trauma History (N = 92)	
	n	%	n	%
2-4/4-2	12	16.2	16	17.4
4-6/6-4	8	10.8	3	3.3
2-3/3-2	6	8.1	9	9.8
3-4/4-3	4	5.4	7	7.6
4-5/5-4	4	5.4	4	4.3
6-8/8-6	4	5.4	5	5.4
2-5/5-2	3	4.1	0	0
4-0/0-4	3	4.1	1	1.1
7-8/8-7	3	4.1	0	0
1-9/9-1	3	4.1	1	1.1
1-2/2-1	2	2.7	0	0
1-3/3-1	2	2.7	3	3.3
2-0/0-2	2	2.7	3	3.3
4-8/8-4	2	2.7	1	1.1
6-9/9-6	2	2.7	2	2.2
4-9/9-4	2	2.7	6	6.5
8-9/9-8	2	2.7	3	3.3
1-4/4-1	1	1.4	0	0
1-5/5-1	1	1.4	0	0
3-0/0-3	1	1.4	0	0
3-5/5-3	1	1.4	3	3.3
3-8/8-3	1	1.4	1	1.1
3-9/9-3	1	1.4	0	0
5-6/6-5	1	1.4	0	0
3-6/6-3	1	1.4	1	1.1
5-7/7-5	1	1.4	0	0
2-8/8-2	1	1.4	1	1.1
1-6/6-1	0	0	1	1.1
1-8/8-1	0	0	1	1.1
1-9/9-1	0	0	1	1.1
2-6/6-2	0	0	1	1.1
2-7/7-2	0	0	2	2.2
2-9/9-2	0	0	8	8.7
4-7/7-4	0	0	1	1.1
5-0/0-5	0	0	1	1.1
6-0/0-6	0	0	2	2.2
3-6/6-3	0	0	1	1.1
1-7/7-1	0	0	1	1.1
6-7/7-6	0	0	1	1.1
7-9/9-7	0	0	1	1.1
9-0/0-9	0	0	1	1.1

Figure 1



## Chapter 5

### The Summary of the Study

Exposure to trauma can cause significant mental health difficulties, including PTSD, and other anxiety, mood, substance abuse, and behavioral disorders (Ackerman, et al., 1998; Caffo, et al., 2005; Famularo et al., 1996; Putnam, 1997; Streeck-Fischer & van der Kolk, 2000).

Additionally, recent researchers have hypothesized that trauma exposure in childhood/adolescence may serve as a catalyst along a pathway that leads to involvement in the juvenile justice system (Ford, et al., 2006). This research suggests that trauma, particularly prolonged trauma such as childhood maltreatment, affects a youth so profoundly that it results in increased susceptibility to psychological, behavioral, and relational problems over the course of adolescence, that it may result in juvenile court involvement. Rates of trauma exposure in samples of juvenile offenders have ranged from 70% to 92.5%, which is consistently higher than rates of trauma identified in community samples of adolescents (Abram et al., 2004; Cauffman, et al., 1998; Dixon, et al., 2005; Garland et al., 2001). Often, systems that come into contact with children who have been exposed to traumatic events, particularly the juvenile justice system, may be more likely to identify behavioral symptoms, such as acting out, rule-breaking behavior, and agitation, and professionals within those systems may not make a connection between these externalizing symptoms and the traumatic events in a youth's past.

Psychological evaluations are a routine part of the juvenile justice system in order to identify mental health disorders and treatment needs for adjudicated youths. However, the juvenile justice system is, by its nature, more focused on externalizing symptoms (i.e. behavior

problems and rule-breaking) than internalizing symptoms (i.e. anxiety and depression). As such, psychological evaluations in the juvenile justice system may not investigate a history of trauma exposure or emphasize a connection between trauma exposure and the individual's externalizing symptoms and disruptive behaviors, even though research has identified trauma's strong influence on the mental health of youths involved in the juvenile justice system (Ford, et al., 2007). The Minnesota Multiphasic Personality Inventory – Adolescent (MMPI-A; Butcher et al., 1992) is the most commonly used self-report measure of adolescent psychopathology (Archer & Newsome, 2000). Its widespread use in forensic evaluations with juvenile offenders (Archer, et al., 2006) has led to significant research into the validity of its use with this population (Baum, et al., 2009). Due to the extensive use of the MMPI-A with the juvenile offender population, it would benefit clinicians and clients if its use in detecting the mental health effects of trauma were investigated. Of specific interest is determining the utility of the scores from the MMPI-A Validity and Clinical scales in differentiating between juvenile offenders with a reported history of trauma and those without a reported trauma history. It would also be useful if items could be identified that, when responded in the critical direction, indicate to the clinician the possibility of trauma exposure. If identified, this information may lead to more effective treatment recommendations and intervention delivery for juvenile offenders with a history of trauma exposure, particularly childhood maltreatment and/or grief and loss. This study attempted to address this need and examined the mental health consequences of childhood traumatic events, specifically types of childhood maltreatment and grief and loss, through the profiles and responses on the MMPI-A produced by a sample of juvenile offenders with and without a trauma history.

In this study, 186 psychological evaluations conducted with adolescents ranging in age from 14-18 years old, who were referred from the Department of Juvenile Justice in a southern U.S. state, were examined to identify the presence and type of trauma history. Cases were labeled by classifications identified from the clinical interview conducted as part of the psychological evaluation. These classifications included trauma grouping (trauma history or no trauma history), type of trauma history (physical abuse, sexual abuse, neglect, grief and loss, and multiple victimizations), self-reported race (Black, White, Latino/a, Asian, and Biracial), and gender (male and female). Each case's corresponding MMPI-A profiles and responses were examined for differences along these classifications.

The hypotheses for the present study were:

Hypothesis 1: Juvenile offenders who identify a history of trauma exposure will produce higher elevations on the MMPI-A Validity and Clinical Scales than those who denied a history of trauma exposure in the present sample.

Hypothesis 2: Juvenile offenders who experience sexual abuse and/or assault will have the highest level of elevations compared to the other trauma groups (physical abuse, sexual abuse, neglect, grief and loss, and multiple victimizations).

Hypothesis 3: Female juvenile offenders who identify a history of trauma exposure will have higher elevations than male juvenile offenders who identify a history of trauma exposure.

Hypothesis 4: Items can be identified from the MMPI-A which successfully distinguish individuals who are experiencing mental health difficulties as a result of trauma exposure from those who deny such traumatic experiences.

To examine Hypothesis 1, a One-Way Multivariate Analysis of Variance (MANOVA) was conducted to determine the effect of experiencing trauma (trauma history vs. no trauma



history) on the 13 MMPI-A Validity and Clinical Scales and examine if there is an interaction between experiencing trauma and a participant's self-reported race (Black and White).

Furthermore, a Descriptive Discriminant Analysis (DDA) was conducted mainly to determine if the differences between the trauma and no trauma groups on the MMPI-A clinical scales could be used to correctly classify members of those groups. To examine Hypothesis 2, a MANOVA was conducted to attempt to compare the impact of each type of trauma on the 13 MMPI-A Validity and Clinical Scales. Due to significant differences in sample sizes, gender was not included in the MANOVA with trauma group and self-reported race and separate MANOVAs for male and females were conducted to determine if there were mean differences between trauma history and no trauma history along the 13 MMPI-A Validity and Clinical Scales. To examine Hypothesis 3, gender differences within the trauma history groups were also examined utilizing a MANOVA. The MANOVA compared the male trauma history group means on the MMPI-A scales of interest with the female trauma history group means. To examine Hypothesis 4, individual MMPI-A items were explored utilizing chi-square analyses to identify items on which there were group differences in responding (between the trauma history group and the no trauma group). These items were further examined utilizing logistic regression to determine if they could be utilized in a subscale for the MMPI-A that identifies juvenile offenders as having mental health reactions to trauma, specifically childhood maltreatment and/or grief and loss. A frequency distribution of the cases' two-point code-types on the MMPI-A Clinical scales was also conducted to provide qualitative information about the clinical elevations of the two groups (trauma history and no trauma history).

## Conclusions

The findings of the MANOVA conducted to determine if there were significant scale differences between the trauma history and no trauma history groups supported Hypothesis 1: Juvenile Offenders with a history of trauma did produce significantly higher elevations on the MMPI-A Validity and Clinical Scales than juvenile offenders who denied a history of trauma exposure. The trauma history group had significantly higher elevations on Clinical Scales 1, 2, 3, 4, 6, 7, 8, and 0 and Validity Scale F. This indicates that juvenile offenders with an admitted history of exposure to childhood maltreatment and/or grief and loss responded in such a manner on the MMPI-A as to suggest that they had higher levels of somatic and physical concerns (Scale 1; Hypochondriasis), higher levels of depression, social withdrawal, and dissatisfaction/apathy towards life (Scale 2, Depression), were more likely to experience stress through physical symptoms (Scale 3; Hysteria); had more interpersonal conflicts, difficulty with authority, and increased delinquent behaviors (Scale 4; Psychopathic Deviate), were more cynical, rigid in their thinking patterns, and had increased sensitivity in interpersonal situations that may be perceived by others as hypervigilance or paranoia, as well as classic psychotic symptoms (Scale 6; Paranoia), had increased symptoms of anxiety and emotional distress (Scale 7; Psychasthenia), had increased feelings of alienation and social withdrawal, as well as “classic” symptoms of schizophrenia (Scale 8, Schizophrenia), and had higher levels of discomfort in social situations and interpersonal relationships (Scale 0, Si; Archer, 2005; Butcher, et al., 1992). It also indicates that cases in the trauma history group endorsed significantly more infrequently endorsed items, which may be perceived as a “cry for help” (Validity Scale F). There were not significant differences on Clinical Scales 5 and 9, or on Validity Scales L and K. This indicates juvenile offenders with a trauma history did not differ significantly from their counterparts with no

trauma history on the endorsement of traditionally masculine or feminine ideas and roles (Scale 5; Masculinity-Femininity) or on reported level of manic symptoms, including reportedly similar levels of irritability, elevated mood, and energy level (Scale 9; Mania). It also indicates that both groups of juvenile offenders had similar frequencies of endorsing items that deny common human failings (Validity Scale L) and similar levels of defensiveness (Validity Scale K).

As previously mentioned, the degree of elevation on MMPI-A Validity and Clinical Scales provides important clinical information. Scores that fall between 60 - 65 are considered “Marginally Elevated” which indicates a possible area of concern for the respondent. Marginal elevations suggest that the respondent likely demonstrates some, but not all, of the behaviors and problems associated with the scale on which the elevation falls, and these problems may be severe enough to require mental health services. Scores that fall above 65 are considered “Clinically Elevated”, which indicates a significant area of concern. Clinical elevations suggest that it is likely that the respondent demonstrates many of the behaviors and problems associated with that scale, and these behaviors and problems significantly impact their functioning (Archer, 2005). To further examine the importance of the differences found between the two groups in the MANOVA, group means were examined for clinical elevations. The trauma history group had marginal elevations on Validity Scale F ( $M = 60.26$ ), and Clinical Scales 4 (Pd;  $M = 62.16$ ), 2 (D;  $M = 61.31$ ), and 6 (Pa;  $M = 60.03$ ). Interpretation of these elevations suggests that, as a whole, the trauma history group endorsed a significant number of infrequently endorsed items, which may be a cry for help or a sign of significant psychopathology. The clinical interpretation also would identify that the trauma history group could be described as angry, rebellious, and disruptive, experience significant dissatisfaction and hopelessness with life, lack self-confidence, feel generally inadequate, are socially withdrawn and isolated, are suspicious and distrustful in

interpersonal relationships, have problems in school settings, often argue or have conflicts with caregivers and authority figures, and may have trouble in therapy due to being interpersonally guarded (Archer, 2005). While the no trauma history group's means followed a similar profile pattern, (See Figure 1) they did not meet marginal or clinical elevations. This indicates these issues are not reported to be a significant problem by these respondents.

The marginal elevations on Scales F, 2, 4, and 6 correspond with a previous study that identified significant differences on these scales, along with Scales 8 and 0 (scores that also fell in the elevated range for clinical interpretation on the MMPI-A) between sexually abused and non-sexually abused adolescents in a residential facility that provided mental health services (Forbey, Ben-Porath, & Davis, 2000). The adolescents in that study were referred to the facility by either legal or psychiatric services, which is similar to the current sample that was referred by only legal services. The current study lends additional support that Scales F, 2, 4, and 6 may be useful in identifying individuals who have a history of childhood maltreatment and/or grief and loss, particularly among adolescents referred for mental health services from the juvenile justice system.

These elevations for the trauma history group correspond with the calculated two-point code-type frequencies for individual cases. In the MMPI, MMPI-2, and MMPI-A, interpretation of an individual's scores has often consisted of examination of the profile patterns and identifying the two highest scales. The two highest scales are considered to provide the most information about an individual's responses on the MMPI-A and their current personality functioning. Thus the two highest scales become the respondent's two-point code-type (Butcher, et al., 1992). The code-type frequency tabulation identified that a 2-4/4-2 code-type was the most common for individual cases in both the trauma history and no trauma history groups (16%

and 17% of cases, respectively). Research into the 2-4/4-2 code type indicates that individuals with this code-type often have problems with authority figures and tend to display externalizing symptoms and act out. Individuals with this code-type often have a history of legal involvement. Additionally, research has suggested that individuals with this code-type often report disruptive, highly conflictual home environments and may be in trouble for attempting to runaway from this disruptive environment. Research has found that adolescents with this code-type often described their parents as unaffectionate and inconsistent, and also report that they do not have anyone in their family with whom they can confide personal information. This description would theoretically fit with adolescents who are experiencing significant disturbances in their lives that they identify it as traumatic, such as childhood maltreatment and/or grief and loss (Archer, 2005).

The 2-4/4-2 code-type identified in this study as the code-type for the trauma history and no trauma history groups by their respective group means, and also identified as the most frequent individual profile for bother groups is noteworthy, as Baum and colleagues (2009) identified the 4-9/9-4 code-type as the most common code-type among juvenile offenders through a meta-analysis of research on juvenile offenders using the MMPI-A. In the present study, the 4-9/9-4 code-type had a frequency of 2 cases (2.7%) for the trauma history group and 6 cases (6.5%) for the no trauma history group. This difference in code-type from the expected 4-9 code-type is not solely attributable to the trauma history, as it was the most frequent code-type in both the trauma history and no trauma history groups. Also, the DDA identified that trauma grouping accounted for 15% of the variance between the trauma history and no trauma history groups, so there are likely a multitude of other factors that influenced the scores seen on the MMPI-A scales in this sample that resulted in the 2-4/4-2 code-type being most prominent.

However, the marginal elevations found for the trauma history group that were significantly different from the no trauma history group are hypothesized to be at least partially attributable to trauma exposure.

The descriptive discriminant analysis (DDA) provided additional support for Hypothesis 1. The DDA identified that the ten MMPI-A scales included in the analysis accounted for 15% of the variability between the trauma history and no trauma history groups. It identified that the scales contributed to group separation in the following order (from most to least contributory): Scale 8, Scale 1, Scale 6, Scale F, Scale 0, Scale 4, Scale 7, Scale 2, Scale 5, and Scale 3. As found in the MANOVA that investigated group mean differences between the trauma groups, the DDA also identified that Scales L, K, and 9 (Ma) did not contribute meaningfully to differentiating between the two groups, thus these scales were excluded from the subsequent DDA analyses.

Although the DDA created a model that successfully differentiated between the trauma history and no trauma history groups to a statistically significant degree, this model was also able to correctly predicted group membership at a rate of 62.2%. This was slightly below the benchmark set for considering the model to be a useful predictor of group membership, which was 63.25% (Hosmer & Lemeshow, 2000).

Although the DDA did not produce a useful model for classifying the cases in this study into the correct trauma history or no trauma history group, it did identify significant differences between the two groups. Therefore, the DDA also supports Hypothesis 1. Additionally, results of these analyses study suggests that for juvenile offenders, a two-point code-type of 2-4/4-2 that fall in the marginally or clinically elevated ranges, as well as marginal or clinical elevations on

Scales F and 6 of the MMPI-A may suggest the individual has a history of trauma exposure, specifically maltreatment and/or grief and loss.

The impact of self-reported race on how trauma history influenced scores on the MMPI-A scales of interest was investigated by including self-reported race as an independent variable along with trauma grouping in the previously reported MANOVA. However, due to sample size, only the Black and White groups were able to be included in this analysis. It was identified that the White group had a significantly higher group mean ( $M = 57.82$ ) on Scale 3 (Hysteria) than the Black group ( $M = 50.41$ ). This indicates that the White group responded to items on the MMPI-A to indicate they, as a group, experienced more somatic concerns, endorsed more items related to having an achievement orientation, reacted to stress through the development of physical symptoms, and had stronger needs for attention and approval than the Black group (Archer, 2005). There were no other significant differences between the group means of Whites and Blacks indicating that these two groups did not differ on the other twelve MMPI-A scales of interest. This suggests that cultural differences between racial groups did not impact responding on the MMPI-A to the extent that the previously reported differences between trauma history and no trauma history group means were driven by the responses of one racial group over the other.

There was not a significant interaction between self-reported race and trauma grouping. However, power for this aspect of the MANOVA was not sufficient to detect a difference if one did exist. Examination of the group means suggest there may be important clinical information to be derived from these scores when separated by self-reported race and trauma grouping. Cases with White participants in the trauma history group had “Marginally Elevated” scores (scores between 60-65) on Scales F ( $M = 62.82$ ), 1 (Hs;  $M = 61.82$ ), 2 (D;  $M = 64.24$ ), 3 (Hy;  $M = 61.68$ ), 6 (Pa;  $62.00$ ), and 8 (Sc;  $M = 61.00$ ) and a “Clinically Elevated” score (scores above

65) on Scale 4 (Pd;  $M = 65.35$ ). However, there were no “Marginally” or “Clinically elevated” scores for cases with Black participants in the trauma history group. This suggests that although there was not a significant interaction effect for self-reported race and trauma grouping, it is possible that the scores from Whites in the trauma history group may be influencing the differences found between trauma history and no trauma history.

In the present study, the lack of a significant interaction between self-reported race and trauma grouping is consistent with previous research that did not identify differences in rates of PTSD across self-reported race/ethnicities in juvenile offenders (Abram, et al., 2004). Additionally, it corresponds with a review of the literature that did not find significant differences in rates of PTSD diagnoses between Blacks and Whites (Pole, et al., 2008). One study also found that Black juvenile offenders were less likely to report significant mental health symptoms than their White counterparts, although Black children were more likely to be victims of violence and trauma (Vaughn, et al., 2008), which would be in line with the findings of the present study. However, the results of the present study are in contrast with previous research that identified Black and Latino/a youths as experiencing more severe mental health reactions to experiencing abuse and/or neglect, including depressive symptoms and behavior and self-esteem difficulties, than their White counterparts (Sanders-Phillips, et al., 1995; Stein, et al., 1988).

Hypothesis 2 was examined using a MANOVA. It was hypothesized that among cases with a trauma history, those cases that were categorized as having reported experiencing sexual abuse only would have higher elevations on the MMPI-A Validity and Clinical scales than the other four types of trauma investigated (physical abuse, neglect, grief and loss, and multiple victimizations). However, neglect had to be excluded from the analyses because of having an insufficient sample size ( $N = 4$ ). The results of this MANOVA did not support Hypothesis 2, as



the thirteen MMPI-A scales of interest's group means for the four trauma types did not differ significantly. Examination of the estimated marginal means identified that all four trauma subtypes had scores falling in the "Marginally Elevated" range on Scales 2 (D) and 4 (Pd). Additionally, two of the four subtypes (sexual abuse and multiple victimizations) had means falling in the "Marginally Elevated" range on Scale F, 6 (Pa) and 8 (Sc). While this does not support Hypothesis 2, it does suggest that there is not one type of trauma driving the observed differences in group means between the trauma history and no trauma history groups. It also suggests that among the trauma history group, cases categorized into the sexual abuse and multiple victimizations had quantitatively more elevations on the MMPI-A Clinical Scales than cases categorized into the physical abuse and grief and loss groups. The present findings are in contrast with research that found sexual abuse produced more significant psychopathology than other forms of maltreatment (Herrera & McCloskey, 2003; Siegel & Williams, 2003).

The MANOVA examining differences between cases from males in the trauma history group and males in the no trauma history group found that males in the trauma history group had significantly higher group means on Scales F, 1 (Hs), 2 (D), 6 (Pa), 7 (Pt), 8 (Sc), and 0 (Si) than those in the no trauma history group. This suggests that, as a group, males in the trauma history group endorsed more infrequently endorsed items, identified more bodily concerns and physical complaints, more social withdrawal, lack of interest in activities, and general dissatisfaction and/or apathy towards life, increased sensitivity in interpersonal situations that may seem like hypervigilance or paranoia, cynicism, and more rigid thinking, as well as classic psychotic symptoms, increased symptoms of anxiety and emotional distress, increased feelings of alienation and social withdrawal, as well as classic symptoms of schizophrenia, and higher levels of discomfort in social situations and interpersonal relationships (Scale 0, Si; Archer, 2005).

Comparatively, no significant differences were found between cases from females in the trauma history group and females in the no trauma history group on the MMPI-A scales of interest. This indicates that females had a similar response style on the MMPI-A, regardless of trauma grouping. However, the analysis indicated there was not sufficient power to detect a difference between the two groups if a difference did exist. Given the small sample size for both female groups (trauma history,  $N = 29$ ; no trauma history,  $N = 12$ ), significant differences may have emerged with larger sample sizes.

A MANOVA was conducted to examine Hypothesis 3 and determine if cases of female juvenile offenders who identified a history of trauma exposure had higher scores on the MMPI-A scales of interest than cases of male juvenile offenders who identified a history of trauma exposure. This analysis identified that there was a statistically significant differences between these two groups on Scale 5 (Mf). Given that the purpose of this scale is to measure the respondent's endorsement of traditionally masculine or feminine ideas and roles, it is logical that male and female juvenile offenders would have significantly different group means on this scale. The higher the score on this scale, the more feminine ideas and roles endorsed, while the lower the score, the more masculine ideas and roles endorsed. The means for these two groups fall along these lines, and the significant difference is explained by the independent variable being gender. The lack of significant differences between males with a history of trauma and females with a history of trauma does not support Hypothesis 3, indicating males and females with a history of trauma do not differ significantly in their scores on the MMPI-A Validity and Clinical Scales. This is interesting as it suggests that neither gender is driving the significant differences identified between the trauma history and no trauma history groups. These findings are in contrast with research that has identified women as having a higher likelihood of developing

PTSD after trauma exposure (Breslau, 2002; Breslau & Anthony, 2007; Holbrook et al., 2002; Keonen & Widom, 2009). However, a study that examined rates of PTSD among juvenile offenders found similar rates of PTSD between male and female offenders (Abram, et al., 2004). This, along with the current study, suggest that male and female juvenile offenders may not differ significantly in their responses to trauma, as measured by the MMPI-A.

The information from these MANOVAs corresponds with the two-point code frequencies. As previously stated, the two-point code frequency tabulation identified 2-4/4-2 as the most common code-type for both the trauma history and no trauma history groups. Examination of the group means for self-reported race and gender identified the elevations on Scales 2 and 4 fell in the marginally elevated range for male and female juvenile offenders with a history of trauma. In addition, males and Whites, as separate groups, also demonstrated marginal elevations Scale 6 and Scale F. Females only demonstrated an additional marginal elevation on Scale F. However, while cases with Black participants had the same code-type, the elevations on these scores did not reach clinical significance, indicating that these symptoms are not significant problems for these participants. This suggests that the 2-4/4-2 code-type with additional significant elevations on Scales F and 6 may be an indicator of a presence of a history of childhood maltreatment and/or grief and loss, but more so for White juvenile offenders than Black juvenile offenders.

Chi-square analyses and a subsequent logistic regression were conducted to investigate Hypothesis 4: can items from the MMPI-A be identified that successfully distinguish individuals who are experiencing mental health difficulties as a result of trauma exposure, specifically childhood maltreatment and/or grief and loss, from those who deny such traumatic experiences. The logistic regression compared item-level responses on the MMPI-A from the trauma history

group and the no trauma history group. Out of the 478 items, the chi-square analyses identified 17 items as having a significant relationship between trauma grouping and responding in a particular direction (true or false) on those items. The logistic regression identified that these 17 items created a model that was a relatively good predictor of trauma group membership. This indicates that, for cases in the trauma history group, the responses on these 17 items differed significantly from the responses of cases in the no trauma history group. The model created in the logistic regression classified 75.8% of the cases into the correct trauma grouping based on their responses on these 17 items. This was considered a useful model as set by the benchmark of a 25% increase over chance. This model successfully classified 65.5% of cases into the trauma history grouping and 84.3% of cases into the no trauma history group. This indicates that although the model was considered useful, it was a better predictor of no trauma history than trauma history membership. This suggests that the no trauma group had a more consistent way of responding on these 17 items than the trauma history group. This consistent response style made it easier to classify these cases into the correct group. It also suggests that the trauma history group did not always respond in such a way that was consistent with the trauma history classification as created by this 17 item model. However, this model is still useful, as it suggests the likelihood of an individual who endorses some combination of these 17 items in the critical direction not having a history of trauma is approximately 15%. It also suggests that even if some combination of these 17 items are not endorsed, there is a possibility that the respondent could have a history of trauma exposure.

Nonetheless, the scale created by this logistic regression is a start to creating a scale or identifying critical items that give practitioners insight into whether a juvenile offender may have a history of trauma. Altogether, the item content endorsed on these seventeen items describes an

individual who is significantly anxious and depressed, and experiences these symptoms through somatic and physical complaints. It also suggests that these individuals feel a considerable amount of anger and alienation and express these emotions through externalizing behaviors. These items describe an individual who feels socially isolated and alienated, experiences some degree of fear at home and denies having anyone in their family in whom they can confide (See Table 9 for item content). This item profile corresponds with research that suggests that individuals who experience childhood maltreatment are diagnosed not only with PTSD, but also have other comorbid anxiety and mood disorders, as well as psychotic symptoms and suicidal ideation (Famularo et al., 1996). Examination of previous research investigating the mental health difficulties of individuals who have experienced individual categories of childhood maltreatment and/or grief and loss (i.e. physical abuse, sexual abuse, neglect, grief and loss, and multiple victimizations) identified common symptoms among these separate groups, including anxious and depressive symptoms, suicidal ideation, interpersonal difficulties, and experiencing significant anger and difficulty with emotional regulation (Cerel, et al., 2006; Jacobs & Bovasso, 2009; De Bellis, 2001; Dowdney, 2000; Melhem, et al., 2007; Hildyard & Wolfe, 2002; Polusny & Follette, 1995; Lansford et al., 2002; Kaplan, et al., 1999). The 17 items identified in this study as differentiating between the trauma history and no trauma history groups correspond with these common symptoms.

One previous study was identified that also attempted to assess the MMPI-A's utility in assessing trauma reactions in juvenile offenders (Cashel, et al., 2000). This study examined the utility of the MMPI-2's PK scale. Although the present study was interested in identifying the MMPI-A's utility in identifying mental health symptoms of individuals who have experienced trauma, not just those diagnosed with PTSD, comparison of the items from both studies revealed

five items were the same for both scales: Items 2, 46, 34, 259, and 296 (See Table 9 for Item content). This suggests that the present study identified symptomology that is not solely based on PTSD symptoms.

### **Implications**

As previously stated, the present study found significant differences on the MMPI-A Validity and Clinical Scales between the trauma history and no trauma history groups. These differences identified that the trauma history group had significantly higher scores on Scales F, 1 (Hs), 2 (D), 3 (Hy), 4 (Pd), 6 (Pa), 7 (Pt), 8 (Sc), and 0 (Si). The scales that reached marginal elevations, which suggest the presence of clinically relevant symptoms, for individuals in the trauma history group included Scales F, 2 (D), 4 (Pd), and 6 (Pa), with the two-point code-type being 2-4/4-2. This may be useful in clinical settings with juvenile offenders, as it suggests that juvenile offenders with this 2-4/4-2 code-type with additional elevations on Scales F and 6 (Pa) that reach at least marginal significance are more likely to have a history of trauma exposure, particularly to childhood maltreatment and/or grief and loss than those without such elevations. This profile may indicate to the clinician to inquire further into the adolescent's home life, family history, any reports made to a child protective service agency, losses in the family, disruptions in the home environment and/or placement, and any unusual forms of discipline.

While there was not a statistically significant interaction between self-reported race and trauma exposure, White juvenile offenders in the trauma history group had group means that reached the marginally elevated range, and the previously mentioned two-point code type in the marginally elevated range was descriptive of this population. However, Black juvenile offenders in the trauma history group, while having the same two-point code, did not have group means that reached marginal elevations. This suggests that the previously identified profile of a

juvenile offender with a history of trauma exposure, particularly childhood maltreatment and/or grief and loss, may be more applicable for White juvenile offenders than Black juvenile offenders. While there is not significant research into racial test biases on the MMPI-A, research on the MMPI and the MMPI-2 have supported that there is minimal test biases, and differences in scores between self-reported races and ethnicities correspond with other measures and clinical information, which suggests these differences exist and are not artifacts of the instrument (Ben-Porrath, Shondrick, & Stafford, 1995; Castro, Gordon, Brown, Anestis, & Joiner, 2008; Hall, Bansal, & Lopez, 1999; McNulty, Graham, Ben-Porath, & Stein, 1997; Prichard & Rosenblatt, 1980). This suggests that the clinically relevant differences in scores on the MMPI-A between cases with White or Black participants in the trauma groups may signify a real clinical difference in symptoms. It is also possible that Black juvenile offenders who have a history of trauma do not experience the same mental health reactions as White juvenile offenders with a history of trauma, and the MMPI-A is not sensitive to the symptoms that Black juvenile offender experience.

The present study identified 17 items that, as a group, successfully differentiated between juvenile offenders in the trauma history and no trauma history groups. Individuals who endorsed these items only had an approximately 15% chance of belonging to the no trauma history group. This indicates that the scale was able to strongly predict those who did not report a history of trauma. However, juvenile offenders who reported a trauma history had more variable responding patterns, which made the model less able to correctly classify these cases. The model identified that if an individual did not endorse the items on this scale, they still had an approximately 35% chance of belonging in the trauma history group. It is hypothesized that this may be due to the fact that this scale was striving to identify individuals who had experienced

traumatic events and demonstrated mental health symptoms due to that trauma exposure, but, as the research has demonstrated, everyone reacts to trauma differently. As previously discussed, every individual has differing mental health reactions to events, even events that fall in the same category (i.e. physical abuse). Thus, it is likely easier to classify those who do not have an event to react to, than those who have mental health reactions to a traumatic event, which vary in content and severity from each other. Nonetheless, this is a strong beginning to a scale.

It is likely that, in clinical practice, a combination of the 2-4/4-2 profile with additional Scale F and Scale 6 elevations, all of which reach at least marginal elevations, along with endorsement of some number of the 17 critical items would provide an indication to the clinician that there is a likelihood of the individual having a history of trauma exposure. The information provided from these two sources should influence the clinician's decisions about additional trauma screeners, measures, and interview strategies.

The symptoms captured in the 2-4/4-2 code-type, along with the content of the 17 items identified by the logistic regression, create a profile of an adolescent who experiences significant anger, anxiety and depression, isolation, somatic concerns, poor self-esteem and self-concept, and cognitive difficulties. Altogether, these correspond with the areas impacted by complex trauma, as identified by Cook and colleagues. This suggests that viewing the mental health and behavioral problems of juvenile offenders with a history of childhood maltreatment and/or grief and loss as complex trauma reactions may be a useful and informative approach. The present study suggests that the one-size-fits-all dichotomy of a PTSD diagnosis may not capture the mental health reactions to trauma that are demonstrated in juvenile offenders. It also suggests that viewing the varied mental health symptoms of such juvenile offenders through the lens of complex trauma may assist clinicians in providing more effective treatment and give insight into



trauma as a possible contributor to the mental health symptoms demonstrated by these adolescents.

### **Recommendations for Further Research**

Results of this study suggest that for juvenile offenders, a 2-4/4-2 code-type that falls at least in the marginally elevated range, with additional marginal elevations on Scales F and 6, may indicate the presence of a history of trauma, specifically childhood maltreatment and grief and loss. Archer (2005) identified that individuals with a 2-4/4-2 code-type are at higher risk for associated drug problems. Future research should investigate the MMPI-A scales that assess drug and alcohol problems, specifically scales MAC and PRO, to determine if there are significant differences between juvenile offenders with a trauma history and those without. Future research could also investigate the Harris-Lingoes Scales for Scales 2 and 4 to determine if individuals with a trauma history have elevations on any of these scales that would assist in more accurately identifying an individual with trauma exposure.

Overall, additional research would benefit from recreating this study with larger sample sizes for all groups. This would provide additional statistical power to detect differences and help elucidate the relationship between trauma exposure and mental health difficulties as identified on the MMPI-A. The individual trauma types (physical abuse, sexual abuse, neglect, grief and loss, and multiple victimizations) would benefit from larger sample sizes, as the group means for sexual abuse and multiple victimizations trended towards significance, but there was not adequate power in the analysis to detect a difference due to the small sample sizes. Also, the neglect alone group was not able to be included in the analysis of the impact of distinct forms of trauma on the MMPI-A scores due to its very small sample size. This is surprising as neglect has been identified as the most substantiated form of maltreatment (U.S. Department of Health and

Human Services, 2009) form of maltreatment that causes significant mental health difficulties (Hildyard & Wolfe, 2002). However, it was identified that neglect tends to result in internalizing disorders. The current study examined juvenile offenders, who by the nature of the behaviors needed to become involved in the juvenile justice system, tend to engage in more externalizing behaviors. Future research should attempt to include a larger sample of neglect-only cases of trauma exposure to determine if there is a significant difference in scores on the MMPI-A compared to other forms of childhood maltreatment and/or grief and loss.

Additionally, research has often focused on mental health differences between Black and White groups. This study falls into that category, as the sample size for Latino/a, Asian, and Biracial cases was not sufficient to include those cases in the analysis of interaction effects between self-reported race and trauma history. Therefore, information about these groups' mental health reactions to trauma was unable to be identified in this study. Although the present study did not find an interaction effect for self-reported race and trauma history, the group means suggest that this study's possible profile of a juvenile offender with a history of trauma exposure may be more accurate for White juvenile offenders than for Black juvenile offenders. Future research should include larger sample sizes of all self-reported races to determine if there is in fact an interaction between self-reported race and trauma history and also focus on identifying if the findings of this study (the possible profile elevations for trauma exposure) hold true for Latino/a, Asian, and/or Biracial juvenile offenders.

Additionally, similar research should be conducted with other subpopulations of adolescents, such as those presenting in community mental health and psychiatric hospitals, to identify if this 2-4/4-2 profile is applicable to adolescents with a history of childhood maltreatment and/or grief and loss presenting for mental health services outside of the juvenile

justice system. Adolescents involved in the juvenile justice system have been found to frequently have elevations on Scale 4 (Archer, 2005), as was the case in this sample.

Adolescents presenting in other settings may not have the same externalizing symptoms.

Future research is needed into determining if a scale can be developed for use with juvenile offenders to alert clinicians to a possibility of a history of childhood maltreatment and/or grief and loss. This study identified items that could be used in such a scale. Further research is needed to determine specifics about scale construction, such as how many items need to be endorsed for the scale to correctly classify the respondent into the trauma history group, and the utility of such a scale with a larger sample.

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