PSYCHOMETRIC DETECTION OF PREVIOUS TRAUMA EXPOSURE AMONG ADJUDICATED YOUTH

By

BENJAMIN J. EDNER

(Under the Direction of Brian A. Glaser, Ph.D.)

ABSTRACT

This dissertation examines the psychometric accuracy of self-report measures for detecting previous trauma in juvenile offenders and to establish specific trauma-related symptom scales for this population. To accomplish this task, three studies were conducted. Study one examines the predictive accuracy and factor structure of the *Child Report of Posttraumatic Symptoms* (CROPS). Findings provide moderate support for the CROPS as an accurate measure for detecting previous trauma among adjudicated youth; findings provide preliminary support for a 14-item screener for trauma symptoms for this population. Study two examined the trauma detection accuracy of the *Behavior Assessment System for Children, Second Edition* (BASC-2) clinical scales. Findings provide moderate support for a BASC-2 trauma composite that accurately detects previous trauma exposure among female offenders. Study three examined the trauma detection accuracy of the *Minnesota Multiphasic Personality Inventory—Adolescent (MMPI-A)*. Findings provide limited support for using MMPI-A profiles and clinical scales in isolation to detect trauma. However, results provide empirical support for the MMPI-A Trauma Scale for Juvenile Offenders (TSJO) as an accurate and reliable measure for this population.

INDEX WORDS: Adjudicated youth, Assessment, BASC-2, Cluster analysis, CROPS, Discriminant analysis, Juvenile offenders, MMPI-A, Psychometrics, Scale development, Trauma, TSJO

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By

BENJAMIN J. EDNER

Bachelor of Arts, Indiana University of Pennsylvania, 2010

Master of Science, Chatham University, 2013

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2019

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By

BENJAMIN J. EDNER

Major Professor: Brian A. Glaser, Ph.D.

Committee: Georgia B. Calhoun, Ph.D.
Alan E. Stewart, Ph.D.

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
August 2019

DEDICATION

To my family, friends, and mentors. I could not have done this without you.

ACKNOWLEDGEMENTS

First and foremost I want to acknowledge my partner and fiancée Laura. Without your patience, encouragement, patience, support, patience, love, patience, and patience, none of this would have been possible. I love you and am forever grateful.

To my committee, thank you for believing in me and giving me the autonomy to grow as a scientist and practitioner. To my mentors, thank you for your unwavering support and encouragement throughout this process. I could not have done this without your encouragement and belief. Dr. Glaser and Dr. Calhoun: thank you for providing support, calm, and encouragement when I needed it most. Your offices were a needed safe space where I could vent my anxieties. Thank you for maintaining that through these past 5 years. To Dr. Campbell and Dr. Spears: thank you for all your support, guidance, and for giving me the space to exercise my obsessive proclivities when it comes to assessment and psychometrics. To my mentor and friend Richard: thank you for you willingness to teach me about psychology, counseling, and philosophy wherever, whenever, and for however long it took. I cherish our typical 3 to 4 hour conversations these past 8 years and look forward to having more of them. To my first professional/academic mentor Dr. Glen Getz. Without your support, encouragement, and recommendation, I would have not conquered the hurdle of getting into a PhD program. To Cassandra: thank you for putting up with me! While my energy and eccentricities were probably a lot to handle, your maternal influence helped steady me through this process.

To my parents Bob, Diane, and Daniel: thank you for your emotional, financial, and psychological support throughout this process. You provided the solid foundation that allowed me to accomplish all of this and I am forever grateful. Thank you all for your support and belief in me; it truly takes village.

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CHAPTER I

INTRODUCTION

STATEMENT OF THE PROBLEM

Research has established a robust relation between childhood trauma and juvenile delinquency (Cuevas, Finkelhor, Turner, & Ormrod, 2007; Kerig, Bennett, Thompson, & Becker, 2012; Kerig, 2012). Fang, Brown, Florence, and Mercy (2012) found the average cost per victim of child maltreatment to approximate $210,012 in 2010, total lifetime financial burden approximating $124 billion in 2008. These figures underscore the importance of child maltreatment prevention efforts from a top-down vantage point (Fang et al., 2012), highlighting the need for trauma symptom detection among those impacted (Cohen et al., 2010). As overwhelming amounts of research highlight the connection between childhood maltreatment and future criminality (Herz et al., 2010; Roberts, Baird-Thomas, & Stein, 2008; Ford et al., 2006; Ford et al., 2002), the typical cost of a "high-risk" youth imposes between $4.2 and $7.2 million in costs (Cohen & Piquero, 2009). As such, if "high-risk" youth can be prevented from becoming career criminals, the savings may be vast (Cohen et al., 2009). Given the probable iatrogenic effects of incarceration in conjunction with the cost of ongoing juvenile justice involvement, it is paramount that early prevention and intervention efforts focus on desistence from delinquency and promote overall well-being (Becker & Kerig, 2011).

When viewing the problem from a bottom-up vantage point, it is clear that exposure to trauma and posttraumatic symptom manifest are associated with issues unique to the adjudicated youth population (Perkins, Calhoun, Glaser, & Kunemund, 2016). Unequivocal findings establishing the empirical relation between extensive childhood trauma and higher rates of juvenile delinquency can be dated back to the 1960s (Silver et al., 1969). Since that time, rates of trauma within delinquent populations have been found to be upwards of 90 percent (Ford et al., 2012; Ko et al., 2008; Abram et al., 2004; Wood et al., 2002; Lyons et al., 2001), with a majority percentage meeting full or partial criteria for Posttraumatic Stress Disorder

(PTSD) (Amatya & Barman, 2012). Research demonstrates that the higher the frequency of trauma exposure, the more adjudicated youth report posttraumatic stress reactions, depression, and engage in delinquent behavior (Onifade et al. 2014).

Unique to delinquent populations is exposure to chronic and pervasive traumatic stressors rather than singular adverse events (Vergano, Lauriola, & Speranza, 2015; Ford, Grasso, Hawke, & Chapman, 2013). Such chronicity and/or multiphasic etiology of trauma yield differing developmental consequences (Vergano, Lauriola, & Speranza, 2015; Kerig, 2013; Ford et al., 2013). Chronic trauma exposure can impact the types of defense mechanisms/coping strategies employed by youth in order to successfully navigate prolonged stressors or toxic environments (Bennett & Kerig, 2014). Resulting coping mechanisms can manifest as emotional numbing, dissociative reactions (Kerig, 2013; Terr, 1991; Soloman & Heide, 1999), and the development of callous-unemotional traits in response to chronic emotional reactivity/arousal (Bennett & Kerig, 2014; Kerig et al., 2012). These adopted traits and survival oriented coping mechanisms tend to intensify in response to adjusting to detention/correctional facilities (Onifade et al., 2014). As such, incarceration, and the ways in which juvenile justice systems treat these youth, exacerbates the risk of future criminality and recidivism. This suggests a transactional relation between maltreatment and delinquency (Onifade et al., 2014), yielding repercussions that can intensify trauma symptoms and further perpetuate the engagement in delinquent behavior (Barrett et al., 2014b). Thus, it is not surprising that experiencing early trauma is a robust predictor of criminal recidivism (Cottle, Lee, and Heilbrun, 2001).

Given the elevated rates of PTSD among youth in detention centers, Abram et al. (2007) strongly argue for improved trauma screenings to inform appropriate treatment services. Indeed, research has demonstrated the need for trauma measures that are sensitive for detecting

complex trauma symptoms among juvenile offenders (Ford, 2011). However, further work is needed to develop such measures (Kerig, Moeddel, & Becker, 2011).

When utilizing specific trauma measures with children and adolescents, Strand, Sarmiento, and Pasquale (2005) advise clinicians to consider the following questions: 1) Does the instrument measure exposure to trauma(s), symptomology, or both? 2) Does the instrument solely assess PTSD, or is it sensitive to a variety of trauma related conditions (e.g. complex trauma, hypoarousal, Developmental Trauma Disorder, etc.)? 3) What is the length of administration and scoring associated with the instrument? And, most importantly for the purpose of this dissertation: 4) *what population(s) was the instrument normed on and does the instrument demonstrate appropriate validity and reliability for that population?* Use of screening measures that adequately address the aforementioned considerations may facilitate appropriate allocation of needed resources for youths with trauma-related symptomology (Briggs et al., 2013; Kerig, Moeddel, & Becker, 2011; Kira, 2001). However, despite robust evidence establishing the relation between adverse childhood events and engagement in delinquent behavior, assessments for trauma and/or posttraumatic stress reactions are not routinely administered in standard mental health screenings for adjudicated youth (Kerig, 2013; Ford, Chapman, Hawke, & Albert, 2007).

Policy implications have been recommended for employing universal screening for adverse childhood events within the high-risk adjudicated youth populations (Baglivio & Epps, 2016). This is paramount as accurate assessment and treatment of juvenile offenders with significant histories of trauma is crucial for successful rehabilitation (Wolpaw & Ford, 2004). Baglivio and Epps (2016) go as far as stating, “practitioners are doing a disservice to these youth if neglecting to screen for, and provide or refer for services to address, the multiple exposures experienced” (p. 15). This declaration clearly articulates the need for mental health

practitioners to evaluate for trauma exposure and trauma-related symptoms for this specialized population. By extension, this notion implicates that providing such trauma assessment is to adhere to best practices within our science.

CONTEXT WITHIN COUNSELING PSYCHOLOGY

Counseling psychologists focus on the expressions of human behavior in terms of the relationship between individuals and their environments, a strengths-based perspective rooted in social justice (Romano & Hage, 2000; Gelso & Fretz, 2001). This strengths-based perspective is emphasized over the more traditional focus of clinical psychology – one historically oriented around examining individual deficit or pathology (Gelso & Fretz, 2001; Hall, 2014). This historical shift towards a more humanistic and multicultural focus led to Counseling Psychology adopting the core values of social justice, advocacy, respect for diversity, and inclusivity (Toporek, Kwan, & Williams, 2012; Speight & Vera, 2008; Romano & Hage, 2000). The core values of Counseling Psychology do not solely reside in the area of counseling and psychotherapy but extend to broad areas of applied psychology, including psychological assessment and evaluation (Kazdin, 2006; Suzuki, Onoue, Fukui, & Ezrapour, 2012).

Ford, Chapman, Mack, and Pearson (2006) suggested the link between trauma and juvenile delinquency occurs when victimized adolescents attempt to regain a sense of control. Some instruments used to identify specific areas of trauma may fail to capture the broad range of possible traumatic events that adolescents may have experienced; symptoms related to these areas may not be measured (Briere, 1996). Although use of psychometrically sound instruments is consistent with best practice, validity and reliability are characteristics of the utility of an instrument within a specific setting, with a particular population, and is not necessarily contingent upon sole properties of the instrument itself (Kazdin, 2005). Therefore, support for

the validity of an instrument for its use with a population of interest is necessary (Perkins, Calhoun, & Glaser, 2014).

Use of population-specific instruments promotes using best available research (Kazdin, 2006), clinical expertise (Forrest & Campbell, 2012; Goodheart, 2006), and emphasizes the work of psychologists to improve the mental health field (Toporek, Kwan, & Williams, 2012). Axiomatically, to focus on the cultivation of population-specific instruments is to emphasize individual-environment relations for the provision of more tailored services aimed at meeting the needs of a non-majority population. As such, further exploration and establishment of trauma measures specific for the juvenile offender population will not only provide data relevant for mental health clinicians and other service providers working with juvenile offenders (Perkins, Calhoun, & Glaser, 2014; Briere & Spinazzola, 2005), it will inform and exercise the core values of Counseling Psychology.

PURPOSE OF THE STUDY

The purpose of this dissertation is to identify and validate effective measures that accurately recognize trauma symptomology among juvenile offenders. Establishing the validity and reliability of population-specific instruments can increase treatment effectiveness by informing more empirically supported trauma treatments within an economically pressured climate (Butcher et al., 2015; Kerig, 2013; Ford, 2015). Validation of population-specific instruments adheres to core values of counseling psychology by demonstrating commitment to person-environment considerations, awareness and attention to cultural diversity, and individual client characteristics (Delgado-Romero et al., 2012).

This dissertation is an amalgam of three related studies that examine the effectiveness of detecting previous trauma exposure(s) among adjudicated youth using 1) an empirically validated trauma self-report measure (*Child Report of Posttraumatic Symptoms (CROPS);*

Greenwald & Rubin, 1999); 2) broad-based behavior self-report scale (*Behavior Assessment for Children, Second Edition (BASC-2);* Reynolds & Kamphaus, 2004); and 3) a personality inventory (*Minnesota Multiphasic Personality Inventory—Adolescent (MMPI-A);* Butcher et al., 1992). The studies within this dissertation are further aimed at quantitatively establishing and preliminarily validating population-specific trauma scales for adjudicated youth. Such scales will provide a broader detection of trauma symptoms in juvenile offenders, adhere to best practices of our science, and operate as a manifest effort in practicing the core values of Counseling Psychology.

DEFINITION OF TERMS

Definitions of several significant terms discussed throughout are warranted:

- **Adjudicated Youth; Juvenile Offender:**
  - For the purposes of this dissertation, Adjudicated Youth and Juvenile Offender refer to adolescents between the ages of 12–17 involved in the juvenile justice system.
- **Agglomerative Scheduling:**
  - A hierarchical procedure that begins with each object or observations in a separate cluster. In each subsequent step, the two object clusters that are most similar are combined to build a new aggregate cluster. The process is repeated until all objects are finally combined into a single cluster (Hair & Black, 2002)
- **Assessment:**
  - This dissertation defines assessment as the use of any psychometric instrument(s) intended to measure a psychological construct (Suhr, 2015; Groth-Marnat, 2009). The terms assessment, instrument, inventory, measure, and scale will be used interchangeably throughout.

- **Centroid:**
    - The average or mean value of the objects contained in the cluster on each variable used in the validation process (Hair & Black, 2002).
- **Childhood/Pediatric Trauma:**
    - Childhood trauma is broadly defined as being exposed to and/or experiencing violent and/or stressful event(s) early in life that exceed one's dependable protective and/or defensive operations to effectively cope with said events (Terr, 1991; Maschi, 2006).
- **Cluster Analysis:**
    - Clustering is the multivariate process of grouping similar objects or concepts into differing groups on the basis of similarities or distances (dissimilarities), according to some defined distance measure (Madhulatha, 2012; Johnson & Wichern, 2007).
- **Community Violence:**
    - Community violence is defined as exposure to intentional acts of interpersonal violence committed in public areas by individuals who are not intimately related to the victim. Common types of community violence that affect youth include individual and group conflicts, such as bullying; fights among gangs and other groups; shootings in public areas such as schools and communities; civil wars in foreign countries or "war-like" conditions in U.S. cities; and/or spontaneous or terrorist attacks (National Child Traumatic Stress Network (NCTSN), 2016).
- **Complex Trauma:**
    - van der Kolk (2005) defines complex trauma as experiencing "multiple, chronic and prolonged, developmentally adverse traumatic events, most often of an

interpersonal nature (e.g. sexual or physical abuse, war, community, violence) and early-life onset. These exposures often occur within the child's caregiving system and include physical, emotional, and educational neglect and child maltreatment beginning in early childhood" (p. 2).

- **Cross-Validation:**
    - The empirical process of assessing or establishing external validity, or the generalizability of research findings across different populations, settings, or time periods (Bryant, 2002).
- **Developmental Trauma Disorder (DTD):**
    - DTD results from continued or regular traumatic experiences during childhood, which produces a wide range of symptoms in adulthood that may appear to be separate, often diagnosed as different disorders (Stolbach et al., 2013). However, they are in fact linked to the same common cause. B.A. van der Kolk et al (2009, pp. 6–15) have proposed the following criteria for DTD:
        A. Exposure: The child or adolescent has experienced or witnessed multiple or prolonged adverse events over a period of at least one year beginning in childhood or early adolescence, including:
            a. Direct experience or witnessing of repeated and severe episodes of interpersonal violence; and
            b. Significant disruptions of protective caregiving as the result of repeated changes in primary caregiver; repeated separation from the primary caregiver; and/or exposure to severe and/or persistent emotional abuse

B. Affective and physiological dysregulation: The child exhibits impaired normative developmental competencies related to arousal regulation, including at least two of the following:
    a. Inability to modulate, tolerate, or recover from extreme affect states (e.g., fear, anger, shame), including prolonged and extreme tantrums, or immobilization
    b. Disturbances in regulation in bodily functions (e.g. persistent disturbances in sleeping, eating, and elimination; over-reactivity or under-reactivity to touch and sounds; disorganization during routine transitions)
    c. Reduced awareness/dissociation of sensations, emotions, bodily states
    d. Impaired capacity to describe emotions or bodily states
C. Attentional and behavioral dysregulation: The child exhibits impaired normative developmental competencies related to sustained attention, learning, or coping with stress, including at least three of the following:
    a. Preoccupation with threat, or impaired capacity to perceive threat, including misreading of safety and danger cues
    b. Impaired capacity for self-protection, including extreme risk-taking or thrill-seeking
    c. Maladaptive attempts at self-soothing (e.g., rocking and other rhythmical movements, compulsive masturbation)
    d. Habitual (intentional or automatic) or reactive self-harm
    e. Inability to initiate or sustain goal-directed behavior

D. Self and relational dysregulation: The child exhibits impaired normative developmental competencies in their sense of personal identity and involvement in relationships, including at least three of the following:
    a. Intense preoccupation with safety of the caregiver or other loved ones (including precocious caregiving) or difficulty tolerating reunion with them after separation
    b. Persistent negative sense-of-self, including self-loathing, helplessness, worthlessness, ineffectiveness, or defectiveness
    c. Extreme and persistent distrust, defiance or lack of reciprocal behavior in close relationships with adults or peers
    d. Reactive physical or verbal aggression toward peers, caregivers, or other adults
    e. Inappropriate (excessive or promiscuous) attempts to get intimate contact (including but not limited to sexual or physical intimacy) or excessive reliance on peers or adults for safety and reassurance
    f. Impaired capacity to regulate empathic arousal as evidenced by lack of empathy for, or intolerance of, expressions of distress of others, or excessive responsiveness to the distress of others
E. Posttraumatic spectrum symptoms: The child exhibits at least one symptom in at least two of the three PTSD symptom clusters B, C, and D.
F. Duration: Duration of disturbance (symptoms in DTD Criteria B, C, D, and E) at least 6 months.
G. Functional impairment: The disturbance causes clinically significant distress or impairment in at two of the following areas of functioning:

a. Scholastic: under-performance, non-attendance, disciplinary problems, drop-out, failure to complete degree/credential(s), conflict with school personnel, learning disabilities or intellectual impairment that cannot be accounted for by neurological or other factors
b. Familial: conflict, avoidance/passivity, running away, detachment and surrogate replacements, attempts to physically or emotionally hurt family members, non-fulfillment of responsibilities within the family
c. Peer Group: isolation, deviant affiliations, persistent physical or emotional conflict, avoidance/passivity, involvement in violence or unsafe acts, and/or age-inappropriate affiliations or style of interaction
d. Legal: arrests/recidivism, detention, convictions, incarceration, violation of probation or other court orders, increasingly severe offenses, crimes against other persons, disregard or contempt for the law or for conventional moral standards
e. Health: physical illness or problems that cannot be fully accounted for physical injury or degeneration, involving the digestive, neurological (including conversion symptoms and analgesia), sexual, immune, cardiopulmonary, proprioceptive, or sensory systems, severe headaches (including migraine) or chronic pain or fatigue

f. Vocational (for youth involved in, seeking or referred for employment, vocational training): disinterest in vocation, inability to get or keep jobs, persistent conflict with co-workers or supervisors, under-employment in relation to abilities, failure to achieve expectable advancements

- **Discriminant Analysis (DA):**
    - DA (descriptive or predictive) is a statistical technique that identifies attributes that most accurately discriminate members of two or more groups (Silva & Stam, 2000).
- **Domestic Violence/Intimate Partner Violence (IPV):**
    - Intimate Partner Violence (IPV), also referred to as domestic violence, is defined as when an individual purposely causes harm or threatens the risk of harm to any past or current partner or spouse (National Child Traumatic Stress Network (NCTSN), 2016). Tactics used in IPV can be physical, sexual, financial, verbal, or emotional in nature against the partner. Individuals may also experience stalking, terrorizing, blame, hurt, humiliation, manipulation, and intentional isolation from social supports and family (NCTSN, 2016).
- **Emotional Abuse:**
    - Emotional abuse is defined as injury to the psychological capacity or emotional stability of the child as evidenced by an observable or substantial change in behavior, emotional response, or cognition; and injury as evidenced by anxiety, depression, withdrawal, or aggressive behavior (U.S. Department of Health and Human Services 2016).

- **Loading:**
    - This term refers to the correlation between a factor and an indicator (or item) (Bryant & Yarnold, 2000).
- **Neglect:**
    - Neglect is frequently defined as the failure of a parent or other person with responsibility for the child to provide needed food, clothing, shelter, medical care, or supervision to the degree that the child's health, safety, and well-being are threatened with harm (U.S. Department of Health and Human Services 2016).
- **Physical Abuse:**
    - Physical abuse is generally defined as "any non-accidental physical injury to the child" and can include striking, kicking, burning, or biting the child, or any action that results in a physical impairment of the child (U.S. Department of Health and Human Services 2016).
- **Posttraumatic Stress Disorder (PTSD):**
    - According to the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (DSM-5), a diagnosis of PTSD must include the following criteria:
        A. Stressor: The person exposed to actual or threated: death, serious injury, or sexual violence via direct exposure, witnessing in person or indirectly through close association with the victim, or repeated exposure to aversive details of the event(s).
        B. Intrusion: Person re-experiences events in one or more of the following ways:
            a. Recurrent, involuntary, and intrusive memories, which in children older than six may be present in repetitive play

b. Recurrent distressing dreams, which may or may not exhibit content related to the traumatic event

c. Flashbacks or other dissociative experiences that may range from short episodes to complete loss of consciousness to reenactment of traumatic events during play

d. Psychological distress following exposure to reminders of event(s)

e. Physiological reactivity following exposure to reminders of event(s)

C. Avoidance: Persistent avoidance of thoughts and feelings related to the event(s) or external reminders of the event(s).

D. Negative cognitions and mood: Decline in cognitions and mood that started or increased following the event(s) evidenced by two or more of the following:

a. Memory loss related to important details of the event(s) not due to physical injury or substances

b. Persistent and distorted negative worldview and expectations.

c. Persistent and distorted sense of responsibility regarding event(s)

d. Persistent negative emotions

e. Significantly reduced interest in activities after event

f. Feelings of detachment or estrangement

g. Persistent inability to experience positive emotions

E. Changes in arousal/reactivity: Alterations that started or increased following the event(s) as evidenced by two or more of the following:

a. Aggressive or irritable behavior

b. Reckless or self-destructive behavior

c. Hypervigilance

d. Exaggerated startle response

e. Difficulty concentrating

f. Difficulty falling or staying asleep

F. Duration: Symptoms in Criteria B–E persist for longer than one month.

G. Functional impairment: Individual experiences significant symptom-related distress or impairment in social, occupational, or other important domains of functioning.

- **Principle Components Analysis (PCA):**
  - PCA is a statistical technique used for analyzing the interrelations among a large number of variables for the purpose of condensing the information into a smaller set of underlying components (Bryant & Yarnold, 2000).
- **Psychometrics:**
  - A specialized research area concerned with assessing and establishing the validity and reliability of measurement instruments (Bryant, 2002).
- **Serious/Violent Offenders:**
  - Juvenile offenders who have committed and been charged with a violent felony, such as armed robbery, aggravated rape, and/or homicide (Mulder, Brand, Bullens, & Van Marle, 2010).
- **Sexual Abuse/Assault:**
  - As outlined in title 15–24–1 by the state of Georgia, sexual assault is defined as rape, sodomy, aggravated sodomy, incest, sexual battery, and aggravated sexual battery (Georgia Network to End Sexual Assault (GNESA), 2016). Child molestation (sexual abuse) as outlined in title 16–6–4 by the state of Georgia

defines child molestation as when a person commits an immoral or indecent act to or in the presence of or with any child under the age 16 years with the intent to satisfy the sexual desires of either the child or the person (GNESA, 2016).

- **Trauma (General):**
    - The American Psychological Association (APA) Task Force on Posttraumatic Stress Disorder and Trauma in Children and Adolescents (2008) defines trauma as the emotional response to events that threaten injury, death, and/or physical and emotional safety. Traumatic events include physical, emotional, and/or sexual abuse; neglect; domestic, interpersonal, and/or community violence; motor vehicle accidents, terrorism, and/or natural disasters, among others.
- **Traumatic/Acute Grief:**
    - In the context of this dissertation, acute grief is defined as "a wide range of strong emotions, including shock or disbelief that a loved one is truly gone, intense separation distress, longing, and sadness" (Simon, 2013, pp. 417).
- **Traumatic Event:**
    - According to the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (DSM-5), a traumatic event is defined as an exposure(s) to actual (or threatened) death, serious injury, or sexual violation, and is generally conceptualized as contained within a single incident (American Psychiatric Association (APA), 2013).
- **Validity:**
    - An overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of conclusions drawn from some form of assessment (Bryant, 2002)

RESEARCH STATEMENT: STUDY I

This series of studies is aimed at identifying and validating trauma scales specifically for the juvenile offender population. Study one consists four research questions within two primary aims. For the first aim, this study seeks to examine the baseline accuracy of the *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999) in predicting the presence or absence of previous trauma exposure among delinquent youth. The second aim of the study seeks to examine the underlying factor structure of the CROPS for delinquent youth. Within this aim, higher-order factors will be examined for their unique contribution to the accurate classification of the presence or absence of previous trauma exposure(s) among adjudicated youth – authors will then examine psychometric properties of the factors, if applicable.

Research Questions and Hypotheses

1. Does the CROPS cutoff score accurately identify juvenile offenders who have a reported history of trauma at more than chance rates?
    - *Null Hypothesis One:* The CROPS cutoff score does not accurately identify juvenile offenders with a reported history of trauma at more than chance rates.
2. Does the CROPS total score accurately predict juvenile offenders who have a reported history of trauma at more than chance rates?
    - *Null Hypothesis Two:* The CROPS total score does not accurately identify and/or predict juvenile offenders with a reported history of trauma at more than chance rates.
3. What is the underlying factor structure of the CROPS when used specifically with the juvenile offender population?
    - *Null Hypothesis Three:* No salient factors underlying the structure of the CROPS will emerge.

4. What is the predictive accuracy of underlying CROPS factors in identifying juvenile offenders who have a reported history of trauma, if applicable?
    - *Null Hypothesis Four:* The CROPS factors (if any) do not accurately identify juvenile offenders with a reported history of trauma at more than chance rates.

Assumptions

1. It is assumed that all participants in this study are representative of typical adjudicated youth involved in the juvenile justice system.
2. It is assumed that all participants in the study answered self-report measures truthfully and that all assessment instruments were valid.
3. It is assumed that all invalid measures were removed from data prior to analysis.
4. It is assumed that errors with data management and/or database entry have been addressed and corrected.
5. It is assumed that documentation, including trauma type and other variables, provided by participants, caregivers, and/or the Department of Juvenile Justice system (DJJ) of Georgia reflect accuracy.

Limitations

1. Reliance on self-report data on the CROPS.
2. Lack of validity indicator within the CROPS.
3. Reliance on only one to three sources of historical data to corroborate the reported trauma histories, or lack thereof, among participants.
4. Data was gathered from juvenile offenders in a community mental health setting. As a result, findings do not necessarily generalize to juvenile offenders being held in a detention/correctional facility.

5. The sample of youth from the state of Georgia may not be representative of adjudicated youth from other demographic locations.

RESEARCH STATEMENT: STUDY II

Study two seeks to examine clinical subscale differences on the *Behavior Assessment System for Children, Second Edition, Self-report of Personality—Adolescent* (BASC-2-SRP-A; Reynolds & Kamphaus, 2004) between juvenile offenders with and without a reported history of trauma. This study seeks to examine the unique contributions of each clinical subscale in accurately classifying the presence or absence of previous trauma exposure(s) among adjudicated youth. In addition, this study seeks to extract items within significant clinical subscales (if applicable) that most contribute to the accurate classification of reported trauma history. If identified items are shown to account for a modest portion of variance in accurately classifying youth with previous trauma history, items will be aggregated into a trauma composite – authors will then examine psychometric properties of the trauma composite, if applicable.

Research Questions and Hypotheses

1. Is there a statistical difference between BASC-2-SRP-A clinical subscale scores among adjudicated youth with and without a reported history of trauma at more than chance rates?
    - *Null Hypothesis One:* There is not a statistical difference between the BASC-2-SRP-A clinical subscale scores among adjudicated youth with and without a reported history of trauma at more than chance rates.
2. What BASC-2-SRP-A clinical subscales statistically discriminate juvenile offenders with reported trauma history vs. juvenile offenders without reported trauma history at more than chance rates?

- *Null Hypothesis Two:* There are no BASC-2-SRP-A clinical subscales that statistically discriminate between juvenile offenders with or without a reported history of trauma at more than chance rates.

3. Are there embedded items within the BASC-2-SRP-A clinical subscales that accurately predict the presence or absence of a reported trauma history among juvenile offenders at more than chance rates?
    - *Null Hypothesis Three:* There are no embedded BASC-2-SRP-A clinical subscale items that statistically predict the presence or absence of a reported trauma among juvenile offenders at more than chance rates.

Assumptions

1. It is assumed that all participants in this study are representative of typical adjudicated youth involved in the juvenile justice system.
2. It is assumed that all the BASC-2-SRP-A validity indicators accurately screened-out youth who responded in an invalid manner.
3. It is assumed that all participants in the study answered self-report measures truthfully, and that all assessment instruments included in this study were valid.
4. It is assumed that errors with data management and/or database entry have been addressed and corrected.
5. It is assumed that documentation, including trauma type and other variables, provided by participants, caregivers, and/or the Department of Juvenile Justice (DJJ) system of Georgia reflect accuracy.

Limitations

1. Reliance on self-report data of the BASC-2-SRP-A.

2. Reliance on only one to three sources of historical data to corroborate the reported trauma histories, or lack thereof, among participants.
3. Data was gathered from juvenile offenders in a community mental health setting. As a result, findings do not necessarily generalize to juvenile offenders being held in a detention/correctional facility.
4. The sample of youth from the state of Georgia may not be representative of adjudicated youth from other demographic locations.

RESEARCH STATEMENT: STUDY III

Study three consists of five questions within three primary aims. For the first aim, this study seeks to examine the efficacy of clinical scale profiles of the *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992) in identifying adjudicated youth with and without a reported history of trauma. Next, this study seeks to examine the predictive power and unique contributions of each clinical scale in accurately classifying the presence or absence of previous trauma exposure(s) among adjudicated youth. For the third aim of the study, the 17-item MMPI-A scale, *Trauma Scale for Juvenile Offenders* (TSJO; Murray, Glaser, & Calhoun, 2013), will be cross-validated in order to examine the predicative utility of the scale in accurately classifying the presence or absence of previous trauma exposure(s) among delinquent youth. Together, this study seeks to examine, compare, and contrast the utility of using the MMPI-A clinical scale profiles, individual clinical scales, and the TSJO for detecting prior trauma exposure within this specialized population.

Research Questions and Hypotheses

1. Are there viable MMPI-A clinical scale profile clusters within the sample that statistically classify adjudicated youth with and without a reported history of trauma at more than chance rates?

- *Null Hypothesis One:* Clusters within the MMPI-A clinical scales (if any) do not statistically classify adjudicated youth with and without a reported history of trauma at more than chance rates.

2. Is there a difference between both the MMPI-A clinical scales and the TSJO among adjudicated youth with and without a reported trauma history?
    - *Null Hypothesis Two:* There is no difference between MMPI-A clinical scales or the TSJO among adjudicated youth with and without a reported history of trauma.
3. What individual MMPI-A clinical scales statistically discriminate juvenile offenders with and without a reported history of trauma at more than chance rates?
    - *Null Hypothesis Three:* There are no MMPI-A clinical scales that statistically discriminate between juvenile offenders with or without a reported history of trauma at more than chance rates.
4. Does the TSJO total score statistically predict juvenile offenders who have a reported history of trauma at more than chance rates?
    - *Null Hypothesis Four:* The TSJO total score does not statistically predict the presence or absence of previous trauma exposure(s) among juvenile offenders at more than chance rates.
5. Does the proposed TSJO cutoff score accurately classify juvenile offenders with and without a reported history of trauma at more than chance rates?
    - *Null Hypothesis Five:* TSJO cutoff score does not statistically classify adjudicated youth with and without a reported history of trauma at more than chance rates.

Assumptions

1. It is assumed that all participants in this study are representative of typical adjudicated youth involved in the juvenile justice system.

2. It is assumed that all participants in the study answered self-report measures truthfully and that all assessment instruments were valid.
3. It is assumed that all the MMPI-A validity indicators accurately screened out adjudicated youth who responded in an invalid manner.
4. It is assumed that errors with data management and/or database entry have been addressed and corrected.
5. It is assumed that documentation, including trauma type and other variables, provided by participants, caregivers, and/or the Department of Juvenile Justice (DJJ) system of Georgia reflect accuracy.

Limitations

1. Reliance on self-report data of the MMPI-A.
2. Reliance on only one to three sources of historical data to corroborate the reported trauma histories, or lack thereof, of participants.
3. Data was gathered from juvenile offenders in a community mental health setting. As a result, findings do not necessarily generalize to juvenile offenders being held in a detention/correctional facility.
4. The number of participants. A larger sample size would likely increase the probability of detecting an effect.
5. The sample of youth from the state of Georgia may not be representative of adjudicated youth from other demographic locations.

CHAPTER II

LITERATURE REVIEW

INTRODUCTION

Between 1960 and 2013, the frequency of juvenile court delinquency cases has increased by 161 percent, with more than 31 million youth under juvenile court jurisdiction as of 2013 (Hockenberry & Puzzanchera, 2015). 2010 saw 21 percent of juvenile offenders placed in detention facilities, while 79 percent received community services (Puzzanchera & Robson, 2014). In their meta-analysis, Colins et al. (2010) examined the prevalence of mental health difficulties among adjudicated youth populations from 1955 to 2008. Across 3,401 adjudicated youth, results indicated the prevalence of having one or more mental disorders was 69.9 percent; conduct disorder and substance abuse disorder were the most common diagnoses among juvenile offenders (Colins et al., 2010). Research indicates that being incarcerated during childhood and/or adolescence decreases the likelihood of returning to school while drastically increasing the probability of being classified as having an emotional and/or behavioral disorder (Aizer & Doyle, Jr., 2015). Unsurprisingly, Aizer and Doyle Jr. (2015) found that over a 10-year period, incarcerated youth demonstrated markedly lower high school completion rates as well as higher adult incarceration rates. Due to disproportionate exposure to adverse circumstances, incarcerated youth are at risk for numerous poor behavioral, social, and developmental outcomes (Evans-Chase, 2014).

Research has established a robust relation between childhood trauma and juvenile delinquency (Cuevas, Finkelhor, Turner, & Ormrod, 2007; Kerig, Bennett, Thompson, & Becker, 2012; Kerig, 2012). Fang, Brown, Florence, and Mercy (2012) found the average cost per victim of child maltreatment to approximate $210,012 in 2010, a total lifetime financial burden approximating $124 billion in 2008. These figures underscore the importance of child maltreatment prevention efforts (Fang et al., 2012) and highlight the need for trauma symptom detection among those impacted (Cohen et al., 2010). As overwhelming amounts of research

highlight the connection between childhood maltreatment and future criminality (Herz et al., 2010; Roberts, Baird-Thomas, & Stein, 2008; Ford et al., 2006; Ford et al., 2002), the typical cost of a "high-risk" youth imposes between $4.2 and $7.2 million in costs (Cohen & Piquero, 2009). If "high-risk" youth can be prevented from becoming career criminals, the savings may be vast (Cohen et al., 2009). Given the probable iatrogenic effects of incarceration, in conjunction with the cost of ongoing juvenile justice involvement, it is paramount that early prevention and intervention efforts focus on desistence from delinquency and the promotion of overall well-being (Becker & Kerig, 2011).

As juvenile offenders are overwhelmingly found to have been the victim of childhood maltreatment (Abram et al., 2004), it is critical that adjudicated youth receive evaluation of their psychological state using tests that are appropriate for this population (Kazdin, 2006; Grisso, 2005). Utilization of population-specific measures should be done in order to inform appropriate evidence-based treatments (Goodheart, 2006); this is especially crucial given the strong empirical support for the efficacy of trauma-focused treatments for children and adolescents (Leenarts et al., 2012; Ford, 2015). By creating or establishing psychometrically validated population-specific tests for adjudicated youth, evaluations will be more informative (Denton et al., 2017), treatment plans will be more appropriate (Goodheart, 2006; Kazdin, 2006), and ultimately, mental health services will be more specific and tailored for the individual (Goodheart, 2006; Ford & Blaustein, 2013).

FOUNDATIONS OF PSYCHOTRAUMATOLOGY

Childhood trauma is broadly defined as being exposed to and/or experiencing violent or stressful event(s) early in life that exceed one's dependable coping and/or defensive operations (Terr, 1991; Maschi, 2006). Such events may occur as singular unanticipated events and/or persistent exposure(s) to severe external events (Terr, 1991). Early adverse childhood

experiences involving physical, emotional, and/or sexual abuse; physical and/or emotional neglect; witnessing domestic violence; or experiences of loss/separation can result in such traumatic stress reactions (Logan-Greene & Jones, 2015; Baglivio & Epps, 2016; Harnisher et al., 2015; American Psychiatric Association, 2013).

Traumatic stress reactions can manifest as a myriad of psychological and behavioral symptoms (Evans & Burton, 2013), including: affective dysregulation (Kerig, 2013; Ford & Blaustein, 2013; D'Andrea et al., 2012), depression, anxiety, posttraumatic stress, anger (Kerig et al., 2016a; Maschi, Bradley, & Morgen, 2008; Briere, 1996), dissociation, (Fox et al., 2015; Kerig, 2016b), behavioral aggression (Logan-Green & Jones, 2015; Stimmel, Cruise, Ford, & Weiss, 2014), emotional numbing/avoidance (Post et al., 2014), impulsivity, inattention, distrust (Price, Higa-McMillan, Kim, & Frueh, 2013), and neurocognitive deficits, respectively (De Bellis et al., 2013; Putnam, 2006).

Further, abundant amounts of research elucidate that exposure(s) to early childhood trauma(s) strongly relate to engagements in delinquent behavior (Herz et al., 2010; Duke et al., 2010), chronic juvenile offending patterns (Baglivio et al., 2015; Fox et al., 2015; Benner et al., 2010; Ford et al., 2006; Dodge, Pettit, Bates, & Valente, 1995) and future adult criminality (Wolff & Shi, 2012; Kopp et al., 2009; DeGue & Spatz Widom, 2009; DeGue & Spatz Widom, 2009; Weeks & Widom, 1998; Patterson, 1993).

Neurobiology of Trauma

Experiencing traumatic events is associated with structural and functional neurobiological changes that relate to future juvenile delinquency and adult criminality (Aharoni et al., 2013; Savage, Ellis, & Kozey, 2013; Chretien, & Persinger, 2000; Teicher, 2000). Research demonstrates that experiencing stressful events early in life may result in alterations of neural systems that can compromise functioning to varying degrees (Evans-Chase, 2014;

Perry, 2009; Dyregrov & Yule, 2006; Herman, 1992a). Specifically, exposure to stress-inducing stimuli may reduce myelination and synaptic production, directly impacting the development of various neuroanatomical structures (Teicher, Samson, Anderson, & Ohashi, 2016; Yang, Wu, Hsu, & Ker, 2004; Teicher et al., 2003). Childhood trauma has been found to relate to corpus callosum white matter reduction, lower hippocampal volume, modifications in limbic system firing patterns, and deficits in prefrontal cortical activation (Teicher & Samson, 2016; Carrion, Wong, & Kletter, 2013, Teicher et al., 2003). Volume reductions in the corpus callosum (De Bellis et al., 2002; Glaser, 2000) and hippocampal areas are related to deficits in information processing and working memory (Teicher & Samson, 2016), while changes in limbic firing patterns relate to emotional dysregulation (Teicher et al., 2016; Teicher, 2000).

Varying types of traumatic events early in life can yield morphological alterations in areas of cingulate and prefrontal cortices as well as developmental processes such as neurogenesis, synaptic apoptosis, and myelination (Teicher & Samson, 2016; Teicher et al., 2003). According to Teicher (2003), these alterations in limbic and hippocampal development may subserve the amnestic, dissociative, and/or disinhibitory aspects of PTSD. Research indicates that peritraumatic dissociative responses are generally strong predictors of PTSD onset and are related to activation of right occipital cortical and hippocampal association networks involved in vivid autobiographical recall of highly emotional events (Daniels et al., 2012).

Deficits in prefrontal cortical and cingulate activation relate to various impairments in neurocognitive abilities, including deficits in attention (Bakelaar, 2013); cognitive flexibility (Kavanaugh & Holler, 2014); impulse control (Glenn & Raine, 2013); avoidance learning (Teicher & Samson, 2016); and working memory (Teicher & Samson, 2016; Teicher, 2000). A multitude of studies have documented that exposure to interpersonal trauma during childhood is related to increased impulse dysregulation (D'Andrea et al., 2012) neurocognitive impairment

(Kavanaugh & Holler, 2014), and aggression (Weder et al., 2009). Further, children with PTSD can present with lower expressive language capability as well as underdeveloped executive functions, such as planning and problem-solving skills (Kavanaugh & Holler, 2014; Getz et al., 2013). Given such deficits in neurocognitive functioning, it is not surprising that experiencing childhood trauma is strongly related to engagement in delinquent behavior and criminality (Miura, 2009). In summary, research has demonstrated that early traumatic experiences directly affect the development of emotional, cognitive, and behavioral regulatory mechanisms (Allwood, Bell, & Horan, 2011), which can impact future behavior (DePrince, Weinzierl, & Combs, 2009; Spann, et al., 2014).

Pediatric Trauma Exposure

Childhood maltreatment and childhood exposure to traumatic events is an unfortunate, but relatively common malady within the United States (U.S. Department of Health and Human Services, 2013). As of the 2012 federal fiscal year, the U.S. Department of Health and Human Services (2013) received 3.4 million referrals from Child Protective Service (CPS) agencies that involved 6.3 million children. For childhood maltreatment, the U.S. Department of Health and Human Services (2012) confirmed 676,569 cases in 2011. When tabulated by trauma type, data indicated that 78.5 percent of children experienced neglect; 17.6 percent experienced physical abuse; and 9.1 percent experienced sexual abuse (U.S. Department of Health and Human Services, 2012). Of these victims of childhood maltreatment, 48.6 percent of victims were male and 51.1 percent were female. The racial/ethnic identities of the majority of children were African American (21.5%), Hispanic (22.1%), and White (43.9%) (U.S. Department of Health and Human Services, 2012).

Finkelhor et al. (2013) found that within a national sample consisting of 4,503 youths, upwards of 40 percent reported being a victim physical assault. Costello, Erklani, Fairbank, and

Angold (2003) found within their sample of 5,000 paired interview subjects, approximately 25 percent of youth have experienced a high magnitude stressor (e.g. physical assault, death of a loved one, etc.), while 25 percent of youth have experienced a low magnitude stressor (e.g. sudden transitions, pregnancy, divorce, etc.). With respect to singular event traumas (e.g. natural disasters, automobile accidents, etc.), Adams et al. (2013) found that 50.2 percent of youth between the ages of 12 to 17 years reported previous trauma exposure(s).

Posttraumatic Stress Disorder (PTSD)

According to the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (DSM-5), a traumatic event as an exposure(s) to actual (or threatened) death, serious injury, or sexual violation, and is generally conceptualized as contained within a single incident (American Psychiatric Association (APA), 2013). Data indicate that in the United States, approximately 80 percent of individuals have experienced one or more traumatic events (Breslau, 2009). When split by gender, 60.7 percent of males between the ages of 15 to 24 reported experiencing one or more traumatic events, while 51.2 percent of females within the age-matched cohort reported experiencing one or more traumatic events (Kessler et al., 2005). According to the National Comorbidity Survey Replication (NCS-R; 2005), the lifetime prevalence of PTSD among adults in the general population is around 6.8 percent – estimated from a sample of 5,692 participants. By gender, lifetime prevalence estimates reported to approximate 9.7 percent for females and 3.6 percent for males (NCS-R, 2005); these estimates are consistent with more recent findings (*see* Breslau, 2009).

Research indicates that PTSD impacts approximately five percent of the general youth population in the United States (Merikangas et al., 2010). The rate of PTSD following interpersonal trauma approximated 25.2 percent, while non-interpersonal trauma was 9.7

percent (Alisic et al., 2014). By reported gender, males developed PTSD at a rate of 11.1 percent while females developed PTSD at a rate of 20.8 percent (Alisic et al., 2014).

Comparably, McLaughlin et al. (2013) found that 61.8 percent of adolescents have potentially traumatizing experiences, with lifetime prevalence of developing PTSD at 4.7 percent. In their study, females presented with a 7.3 percent prevalence rate for PTSD, while rates among males demonstrated a prevalence rate of around 2.2 percent (McLaughlin et al., 2013). However, these overall rates have been disputed – research suggests that PTSD rates range from 5 to 21 percent in lifetime prevalence, with females reporting twice the rate of PTSD symptom manifest (Salazar et al., 2014). For both males and females however, research indicates that experiencing severe maltreatment before the age of 10 is significantly associated with the risk of PTSD among individuals who have experienced trauma as an adult (Breslau et al., 2014).

With respect to comorbid symptom presentations, D'Andrea et al. (2012) espouse that comorbidity appears to the rule, rather than the exception. In regard to the relational/causal interplay between these dimensions, Green et al. (2010) approximate that 45 percent of the variance regarding the onset of childhood psychiatric disorders can be accounted for by maltreatment. This relational dynamic is further supported by research elucidating that comorbid symptom severity is exacerbated by the frequency and/or increase of traumatic stressors (Copeland et al., 2007).

Clinical manifestations of PTSD in children and adolescents can present with symptom clusters that satisfy the diagnostic criteria for numerous psychiatric conditions, including: conduct disorder (CD); borderline personality disorder (BPD); major depressive disorder (MDD); phobic and/or panic disorder; obsessive-compulsive disorder (OCD); adjustment disorder; as well as various dissociative conditions (Terr, 1991; Terr, 2003). Approximately 40 percent of

children with a history of trauma present with one or more comorbid mood, anxiety, and/or behavioral disorders (D'Andrea et al., 2012; Copeland, Keeler, Angold, & Costello, 2007). Along with comorbid mood and anxiety disorders, children with a history of trauma also present with high rates of substance use diagnoses and increased suicidal ideation/self-injurious behaviors (Galatzer-Levy, Nickerson, Litz, & Marmar, 2013; Kavanaugh & Holler, 2014). Research indicates that individuals with variations of the aforementioned comorbid disorders are 2.5 times more likely to report suicidal ideation than individuals with PTSD alone (Galatzer-Levy et al., 2013). This is not surprising as PTSD has been shown to be related to increased symptoms of anxiety and depression (Kavanaugh & Holler, 2014), in addition to suicidal ideation (Famularo, Fenton, Kinscherff, & Augustyn, 1996).

Complex Trauma/Developmental Trauma Disorder (DTD)

Complex Posttraumatic Stress Disorder (CPTSD) was first proposed by Herman (1992b) to describe symptoms observed in victims of prolonged, repeated trauma. Herman (1992b) designated a range of reactions stemming from exposure to repeated and sustained trauma. By way of example, Herman (1992b) indicated that such reactions could occur when an individual is held in a state of captivity under the control of the violent perpetrator and is unable to escape. In response, individuals can experience a myriad of reactions, which can include: alterations in consciousness; self- perception; affect regulation; relations with others; and perception of the perpetrator (Resick et al., 2012). Herman (1992) emphasized that the experiences of childhood abuse serves as a significant risk factor for developing complex PTSD.

Ford (2005) identifies complex trauma as trauma that compromises the development of core self-regulatory competences, including executive function/regulation, sensorimotor function, working memory, verbal and autobiographical memory, and social relatedness/functioning. Similarly, Resick et al. (2012) conceptualize the unique qualities of complex PTSD as resulting

from the trauma that compromises one's self-development during the critical period in childhood when self-definition and self-regulation begin to form. Not surprisingly, such interruptions to normative developmental processes can deleteriously impact an individual's self-regulation and self-definition (Courtois & Ford, 2009). As such, complex trauma can alter an individual's systems of meaning as a consequence of prolonged, repeated traumas that begin early in life (Resick et al., 2012).

Youth exposed to complex trauma are at increased risk for additional trauma exposure, as well as physical, legal, vocational, and interpersonal impairment (Cloitre, Petkova, Wang, & Lu, 2012; Briere, Kaltman, & Green, 2008). Individuals who present with complex PTSD can exhibit a concomitant host of additional psychiatric symptoms, including standard PTSD symptoms, somatization, dissociation, affective changes, and pathological changes in identity that deleteriously impact interpersonal relations (Herman, 2012). Repeated interpersonal trauma in particular may result in avoidance reactions due to producing long-term negative emotional states, dysregulation (Briere et al., 2010), and attachment-based difficulties (Rahim, 2014). In children and adolescents, Cook et al. (2005) observed that complex trauma reactions could result in anxiety, depression, substance abuse, oppositional defiant disorder (ODD), and conduct disorder (CD).

Recently, complex PTSD was proposed for inclusion in the DSM-5 under the name Developmental Trauma Disorder (DTD) (Sar, 2011). Specifically, van der Kolk (2009) proposed the creation of a DTD for inclusion in the DSM-5 in response to mounting empirical support of DID operating as a distinct trauma- and stress-related disorder. DID was introduced in an attempt to adequately describe the broad domains of impairment and distress that characterize children and adolescents who have experienced severe and repeated exposure to a traumatic stimulus, or complex trauma (van der Kolk et al., 2009; Sar, 2011) (*see* Definition of Terms for

full DTD criteria, pp. 8 – 12). However, despite the burgeoning research contributing to the empirical grounding of DTD, in the eyes of the American Psychiatric Association (APA), the available scholarship did not provide evidence deemed sufficient for DTD to be considered as a diagnostic category separate from PTSD at the time of the most recent DSM update/revision (Resick et al., 2012).

TRAUMA TYPOLOGY

Although distinct types of traumatic exposure yield differing behavioral manifestations in adolescence, they all relate to experienced trauma symptoms, various neurocognitive impairments, and future delinquent behavior (Kerig et al., 2009; Bücker et al., 2012; Spann et al., 2012; De Bellis et al., 2013; Evans & Burton, 2013). The primary categories of traumatic exposures discussed within the literature (*see* Grasso et al., 2016; Lebb, 2007; Felitti et al., 1998) generally correspond to childhood physical, emotional, and sexual abuse (American Psychiatric Association, 2013; De Bellis et al., 2013; Evans & Burton, 2013; Chen et al., 2010; Kerig et al., 2009; Teicher, 2000; Freud, 1969), physical and emotional neglect (Logan-Greene & Jones, 2015; Evans & Burton, 2013; Gilles, Berntson, Zipf, & Gunnar, 2000; Smith & Thornberry, 1995), witnessing domestic and/or community violence (Baglivio & Epps, 2016; Wolff & Shi, 2012; DePrince et al., 2009; Fishbein et al., 2009), loss of a loved one (Harnisher et al., 2015; Cerel et al., 2006; Dyregrov, 1993), and/or multiple exposures to the aforementioned traumas (American Psychiatric Association, 2013; van der Kolk et al., 2009). A brief overview of these primary trauma types is discussed in more detail below.

Impact of Child Abuse, Physical and Emotional

Experiencing physical and emotional abuse relates to psychological symptoms of depression, anxiety, posttraumatic stress (Kerig et al., 2016a; Kerig et al., 2009; Dembo, Schmeidler, & Childs, 2007), affective disorders (King et al., 2011), and difficulties in day-to-day

executive functioning skills (Getz et al., 2013). Some of the demonstrated neurocognitive deficits relating to physical and emotional abuse include impairments in psychomotor cognitive processing, attention, adaptive response inhibition, and cognitive flexibility (Spann et al., 2012; Becerra-García, 2014; Carrion et al., 2008). Individuals with childhood physical abuse histories were more likely to show deficits in processing pictures with positive or neutral valence (Young & Widom, 2014; Pollak et al., 2000). Psychological symptoms resulting from emotional abuse include: anxiety, depression, personality pathology, somatization, and psychosis (Spertus et al., 2003). As a potential result of these effects, physical and emotional abuse is associated with antisocial behavior and violent and non-violent criminal offenses (Evans & Burton, 2013).

Research demonstrates that physical abuse in childhood is a predictor for total months of incarceration among delinquent offenders (Kopp et al., 2009; Kingree, Phan, & Thompson, 2003). Shin et al. (2016) found that physical abuse in childhood directly relates to engagement in property crime, violent crime, and fraud, while Cuadra et al. (2014) demonstrated that physical abuse is associated with proactive and reactive criminal thinking styles. Moreover, experiencing emotional abuse in conjunction with other neurobiological and temperamental vulnerabilities is related to property crime offenses (Shin et al., 2016) and has been implicated in fostering the development of psychopathy (Schimmenti et al., 2015; Jaffee et al., 2007).

Impact of Child Abuse, Sexual

Sexual abuse has been shown to relate to various psychological symptoms, psychiatric disorders, and neurocognitive deficits (Chen et al., 2010; King et al., 2011; De Bellis et al., 2013). Psychological symptoms related to sexual abuse include anxiety, depression, posttraumatic stress, sleep disturbance, suicidal ideation (Chen et al., 2010), emotional dysregulation (Cloitre et al., 2005) and physical health problems (Irish, Kobayashi, & Delahanty, 2010), respectively. The development of psychiatric disorders associated with sexual abuse

includes attention-deficit/hyperactivity disorder, disruptive behavior disorders, substance use disorder (King et al., 2011), and eating disorder (Chen et al., 2010). Finally, neurocognitive deficits resulting from sexual abuse include impairments in verbal and non-verbal working memory and retrieval, cognitive flexibility, set shifting, language-processing skills (Savitz, et al., 2007; Spann et al., 2012; De Bellis et al., 2013), and recognition of pictures with positive valence (Young & Widom, 2014), respectively.

Within the general population, female youth are significantly more likely to experience sexual abuse than males (Perrin et al., 2014); estimates of abuse range from 19 to 45 percent (Teicher, 2000). With respect to foster youth, sexual abuse was most strongly related to the onset of PTSD (Salazar et al., 2014). Sexual abuse was also strongly associated with bipolar disorder, alcohol dependence, separation anxiety, antisocial personality (Salazar et al., 2014), poor emotional regulation capacities, and dissociation (Hébert, Langevin, & Oussaïd, 2018).

With respect to delinquency, research demonstrates that sexual abuse is associated with an increased risk for juvenile offending (Seto & Lalumiere 2010), delinquent recidivism (Calley, 2012; Cottle, Lee, & Heilbrun, 2001), sexual offending (Asscher, Van der Put, & Stams, 2015), and adult criminality (Cuadra et al., 2014; Kopp et al., 2009). Moreover, adjudicated youth with sexual abuse history are at greater risk for developing posttraumatic stress symptoms that can result in self-injury (Chaplo et al., 2015) compared to their counterparts with no trauma history. By gender, research indicates that being female is a robust predictor of sexual victimization within adjudicated youth populations (Dembo, Schmeidler, & Childs, 2007). Wood et al. (2002) found that approximately three times as many female offenders (29%) reported being molested or sexually assaulted compared to their non-delinquent counterparts (11%). Although occurring less often for males, both male and female offenders have been shown to be greatly unwilling to report sexual abuse (Kerig et al., 2011). It is important to note

however, that sexual abuse has been reported to co-occur with almost perfect concomitance with physical and emotional abuse (Aebi et al., 2015; Pears, Kim, & Fisher, 2008). This makes it difficult to disentangle the unique contribution of sexual abuse from the onset of psychological and/or neurocognitive disturbance.

Impact of Neglect

Physical neglect is associated with psychological symptoms of depression, anxiety, and anger (Evans & Burton, 2013), and relates to various neurocognitive deficits, including: impairments in inhibition, set shifting, selective attention, and cognitive flexibility (Perry et al., 2018; Bücker et al., 2012; Spann et al., 2012). Children who receive inconsistent or harsh caregiving can manifest difficulties processing emotional information (Perry et al., 2018; Young & Widom, 2014). This precludes the development normative emotional processing skills (Pollak et al., 2000). Unsurprisingly, physical neglect has been shown to relate to the development of antisocial behavior and psychopathy (Kolla et al., 2013) characterized by violence/hostility, aggression, and a blunted pattern of emotional reactivity (Gilles et al., 2000). As a consequence, neglect has been repeatedly implicated in juvenile conduct problems (Ryan, Williams, & Courtney, 2013), delinquency (Evans & Burton, 2013) criminal recidivism (Cottle, Lee, & Heilbrun, 2001), and has shown to be a predictive indicator of future arrests and criminal convictions (Smith & Thornberry, 1995; McMackin et al., 1998).

Witnessing Domestic and Community Violence

Exposure to domestic violence is related to psychological symptoms of dissociation, posttraumatic stress (DePrince et al., 2009), depression, and anxiety (Wolff & Shi, 2012). Such exposure(s) to domestic violence is related to the onset of various neurocognitive deficits (DePrince et al., 2009). DePrince et al. (2009) found neurocognitive deficits primarily occur in the areas of working memory, processing speed, inhibition, and selective attention. In addition,

research demonstrates that exposure to domestic violence is associated with aggressive propensities, antisocial behavior, and future incarceration (Eitle & Turner, 2002; Watt, Howells, & Delfabbro, 2004).

Community violence exposure has been shown to relate to psychological symptoms of anger, anxiety, depression, and dissociation (Rosenthal, 2000), and is associated with aggressive behavior in juvenile offenders (Wood et al., 2002). Research indicates that witnessing community violence is associated with affective disturbance, negative emotionality, social problems, aggressive behavior (Kitzmann et al., 2003), delinquency, and violent offending patterns (Basken & Sommers, 2014; Maschi, 2006; Eitle & Turner, 2002). For example, Wood et al. (2002) found that approximately 56 percent of both delinquent males and females reported having witnessed at least one homicide. Unsurprisingly, research suggests that the exposure to this type of violence mediates and statistically predicts the engagement in criminal behavior (Eitle & Turner, 2002). This relational pattern exerts negative impact on academic and occupational functioning (Widom, 1989) and is related to future legal problems in adulthood (Ford et al., 2008).

Neurocognitive deficits relating to community violence exposure were shown to involve decreased problem-solving ability and poor performance on tasks involving emotional attribution (Fishbein et al., 2009). Furthermore, community violence exposure demonstrates a direct link to young adult criminality (Eitle & Turner, 2002), and yields a distinct influence over violent offending (Baskin & Sommers, 2014). Together, this research elucidates the strength of the victimization—offending overlap in that being exposed to, and/or being a victim of, domestic and/or community violence increases the likelihood of engaging in delinquent and/or criminal behavior (Baskin & Sommers, 2014; Jennings, Piquero, & Reingle, 2012; Ford et al., 2008; Eitle & Turner, 2002).

Traumatic Grief and Loss

Simon (2013) defined acute grief to include "a wide range of strong emotions, including shock or disbelief that the loved one is truly gone, intense separation distress, longing, and sadness (p. 417)." Events such as the sudden loss of a parent, sibling, or other loved one can dramatically impact youth and result in a fusion of trauma and grief, potentially yielding PTSD and/or complicated grief reactions (Dyregrov, 1993). Such grief reactions can disrupt the mourning process and evoke feelings of anger, helplessness, and increase the risk for psychopathology onset (Cerel et al., 2006).

Loss of, or separation from, a caregiver is associated with emotional and behavior problems (Ford et al., 2010), such as reactive aggression (Ford, Fraleigh, & Connor, 2010). Such emotional and behavior problems can lead one to gravitate toward and/or develop delinquent peer associations (Ford, Fraleigh, & Connor, 2010). Sure enough, adjudicated youth are reported to be at greater risk for experiencing losses/separations compared to their non-delinquent peers (Harnisher et al., 2015).

When examining a sample of 898 adjudicated youth, Harnisher et al. (2015) found that approximately 25 percent of youth joined a gang following the loss of a loved one. Of the 25 percent of youth that joined gangs, 24.1 percent joined after the loss of a caregiver, 24.0 percent joined after the loss of a close friend, and 17.4 percent joined after the loss of an important person in their lives. Youth who experienced loss were at minimum three times more likely to present with a mood disorder compared to peers who had not experienced such loss (Harnisher et al., 2015). An attribute for the elevated rates of loss among adjudicated youth may perhaps stem from their greater likelihood of residing in communities with elevated poverty, gang involvement, drug use, and crime (Pastore & Maguire, 2002). These observations speak to the

complex relation between community and individual factors and cycles of violence and victimization (Jaffee et al., 2007; Jaffee, Caspi, Moffitt, & Taylor, 2004; Ford et al., 2006).

Type I, Type II, and Type III Traumas

Trauma reactions occur on a continuum with regard to the type and magnitude of trauma exposure(s) and/or chronicity of exposure (Hodges et al., 2013). Research indicates that various trauma symptoms occur broadly within three primary categories: Type I trauma, Type II trauma (Terr, 1991; Tremblay, Hébert, & Piché, 2000), and Type III trauma (Soloman & Heide, 1999; Berk, 1992). Type I traumas are characterized by the occurrence of singular unanticipated events that overwhelm one's defensive operations/coping strategies (Terr, 1991) as to disrupt one's intrapsychic equilibrium (Sauzier, 1984). In contrast, Type II traumas are characterized by long-standing and persistent exposure(s) to severe external events (Terr, 1991). The defensive coping operations utilized to combat these continual stressors often yield profound character changes (Terr, 1991); the result of which, can clinically manifest as symptoms of various personality disorders (Kaehler & Freyd, 2012; Teicher et al., 2002; Kolla et al., 2013).

The additive or accumulative effects of experiencing either singular traumas (Type I) and/or a series of persistent traumas (Type II) on various aspects of an individual's functioning is referred to as a Type III trauma (Soloman & Heide, 1999; Berk, 1992). Type III trauma is characterized by multiple, pervasive, and violent events beginning early in childhood and continuing for an extended period (Solomon & Heide, 1999). Though conceptually similar to Type II trauma, Type III trauma is distinct in that the type of trauma has no foreseeable end (Soloman & Heide, 1999); for example, identity trauma resulting from pervasive types of discrimination (Kira, Smith, Lewandowski, & Templin 2010). Symptoms resulting from Type III traumas include alterations in memory and consciousness manifesting as dissociation, emotional numbing, maladaptive core beliefs, hopelessness, and fragmentation of one's sense-

of-self (Solomon & Heide, 1999), respectively. Such peritraumatic dissociation at the time of initial trauma occurrence(s) may generalize into stable patterns of dissociating when faced with triggering stimuli (Bennett et al., 2015; Chaplo, Kerig, Bennett, & Modrowski, 2015; D'Andrea et al., 2012). It is important to note that while the Type III trauma concept and term is published in the literature, reference to this trauma type precipitously tapered off shortly after its inclusion into field vernacular. This tapering off is likely due to the ambiguous parameters of Type III, which do little to distinguish this trauma type from Type II trauma. More recent research has discussed symptom clusters corresponding to Type II trauma (and by extension Type III trauma) within the framework of complex trauma (Sar, 2011; van der Kolk 2005; van der Kolk et al. 2005; van der Kolk et al. 2009; Cloitre et al., 2009).

As discussed previously, complex trauma symptoms can include alterations in self-perception; affect regulation; dissociation; aggression; social avoidance; perception of perpetrator(s); and/or interpersonal relations (Kerig, Moeddel, & Becker, 2011; Cloitre et al., 2009; Solomon & Heide, 1999). Pervasive and persistent trauma exposures can generate subsequent constellations of trauma symptoms consistent with complex trauma (Kerig, 2013; Cook et al., 2005; van der Kolk et al. 2005). Research demonstrates that complex trauma relates to suicidality as well as the development of subsequent depression, substance use, and externalizing disorders (Adams et al. 2013; Ford et al., 2010; Ford et al., 2012). Refer to *Complex Trauma/Developmental Trauma Disorder* section for a more comprehensive history and symptom discussion.

TRAUMA AND JUVENILE DELINQUENCY

It is well established that extensive childhood maltreatment is associated with higher rates of juvenile delinquency (Smith & Thornberry, 1995; Dodge, Pettit, Bates, & Valente, 1995). These findings date back to estimates from the early work of Silver et al. (1969) indicating rates

of up to 85 percent. Current research supports these initial observations and demonstrates that maltreatment increases the risk of juvenile delinquency (Onifade et al. 2014). Further, the strength of the maltreatment-offending association remained robust even after critical examination of the common methodological features of prospective and longitudinal studies exploring varying aspects of this association (Malvaso, Delfabbro, & Day, 2018).

Ryan and Testa (2005) found that children with early maltreatment were evidenced to demonstrate delinquency rates 47 percent greater than children with no substantiated maltreatment allegation(s). Further, 38 percent of maltreated youth are more likely to engage in delinquent behaviors at an earlier age (Barrett et al., 2014a), commit violent offenses (Widom, 1989), and be incarcerated as an adult (Mersky & Topitzes, 2010). Unsurprisingly, Duke et al. (2010) found that youth who experience adverse childhood events were two to 44 times more likely to engage in delinquency, with behaviors ranging from fighting, bullying, and dating violence, among others.

Research has established that experiencing early childhood trauma before the age of 12 informs a significantly higher likelihood of becoming involved with the juvenile justice system (Tung & Chhabra, 2011). This finding has been especially robust for male offenders (Maschi, 2006; Perkins, Smith-Darden, Ametrano, & Graham-Bermann, 2014). In fact, males having experienced trauma before the age of 12 were found to be 50 to 79 percent more likely to be adjudicated than a non-traumatized sample (Maschi, 2006). Becker and Kerig (2011) found that 95 percent of male offenders in their sample experienced at least one traumatic event; 20 percent of the sample met the diagnostic criteria for full or partial PTSD. With respect to female offenders, research consistently demonstrates higher rates of PTSD and trauma exposure compared to male counterparts (Kerig et al., 2011; Stewart, Livington, & Dennison, 2008). Wood et al. (2002) found that 25 percent of adjudicated youth reported being physically abused, with

36 percent of female offenders reporting domestic violence. Taken together, juvenile offenders are more likely than their non-delinquent counterparts to experience trauma (Adams et al., 2013).

Research indicates that delinquent youth exposed to trauma(s) or with mental health concerns demonstrated higher likelihoods for engagement in delinquent recidivism (Benner et al., 2010; Cottle, Lee, & Heilbrun, 2001). Benner et al. (2010) found that for every one experienced trauma, offenders were four times more likely to have repeated juvenile status offenses than their non-trauma exposed counterparts. With respect to psychopathology, Bielas et al. (2016) found that the total number of adverse childhood events statistically predicted suicidality, PTSD onset, and affective and mood-based disorders characterized by anxiety and depressive symptoms. Together, these findings are commensurate with research elucidating the association between childhood abuse, poor mental health, reactive aggression, and criminality (Harford, Yi, & Grant, 2014; Hoeve et al., 2015; Benner et al., 2010; Cottle, Lee, & Heilbrun, 2001).

The probability of engaging in delinquent behaviors is greater for children whose early maltreatment trajectories extend into adolescence (Stewart, Livingston, & Dennison, 2008). This resonates with previous work linking the degree of adverse childhood experience(s) to the increased likelihood of youth exhibiting chronic offending patterns throughout adolescence (Baglivio et al. 2015; Fox et al. 2015). These findings are commensurate with Smith and Thornberry (1995) observing that child maltreatment relates to self-reported delinquency – a relation that remained consistent even after controlling for extraneous factors.

Onifade et al. (2014) found that incarceration and the ways in which juvenile justice systems treat maltreated youth, exacerbate the risk of future delinquency. For example, Dierkhising, Lane, & Natsuaki (2014) found that 96.8 percent of their sample of adjudicated

youth experienced some type of abuse while incarcerated. Unsurprisingly, the higher the frequency of trauma exposure, the more adjudicated youth reported posttraumatic stress reactions, depression, and criminal recidivism post their release from detention – this effect remained even after controlling for childhood maltreatment pre-incarceration (Dierkhising, Lane, & Natsuaki, 2014). This suggests a transactional relation between maltreatment and delinquency (Onifade et al., 2014); this can yield repercussions that can intensify such traumatic experiences and further perpetuate the engagement in delinquent behavior (Barrett et al., 2014b). Thus, it is not surprising that in a 2001 meta-analysis by Cottle, Lee, and Heilbrun (2001) with 15,265 juvenile offenders, it was found that experiencing childhood trauma (especially physical and/or emotional abuse) was a statistical predictor of delinquent and criminal recidivism.

When examining trauma rates within delinquent populations, Abram, Teplin, Charles, Longworth, McClelland, and Dulcan (2004) found that 93 percent of boys and 84 percent of girls reported previous trauma exposures. Similarly, Rosenberg et al. (2014) found that 94 percent of adjudicated youth reported at least one trauma, with 45.7 percent satisfying the criteria for PTSD. This rate of PTSD is commensurate with previous research indicating PTSD rates of upwards of 30 to 50 percent (Kerig & Becker, 2012; Foy, Richie, & Conway, 2002). However, traumatic victimization rates generally range from lower estimates of 60 to 70 percent (Baird-Thomas, & Stein, 2008) to higher estimates of upwards of 90 percent (Ford et al., 2012; Ko et al., 2008; Abram et al., 2004; Wood et al., 2002; Lyons et al., 2001).

Among serious juvenile offenders, Amatya and Barzman (2012) found that approximately 47 percent had experienced childhood trauma. Within the reported 47 percent, 31.7 percent demonstrated full criteria for PTSD with 20 percent demonstrating partial criteria (Amatya & Barman, 2012). Detained youth demonstrate a 70 percent higher likelihood of

experiencing physical and/or sexual abuse or maltreatment compared to non-detained peers (Moore, Gaskin, & Indig, 2013).

Within the juvenile corrections systems of Illinois, Weis & the John Howard Association (2011) found that 75 to 93 percent of delinquents had experienced at least one traumatic event in comparison to the average 34 percent of children that experience trauma within the United States as a whole (Weis, John Howard Association, & U.S.A., 2011). As such, detained youth display amplified rates of posttraumatic stress (Wilson et al., 2013; Becker & Kerig, 2011). Interestingly, the severity of PTSD symptoms relate to the degree of delinquency even after controlling for the number of reported traumas (Becker & Kerig, 2011). With respect to satisfying PTSD diagnostic criteria, it is important to note that experiencing multiple types of victimization places youth at greater risk for developing psychosocial impairments and delinquent behavior that is not fully captured by PTSD or psychiatric or behavioral disorders (Ford et al., 2012; Fischer et al., 2016). It is clear however, that PTSD symptom onset uniquely contributes to engagement in delinquent behaviors (Becker & Kerig, 2011; Begle et al., 2011).

Among non-detained adjudicated youth, Wilson et al. (2013) found that 93 percent of youth on probation reported experiencing at least one traumatic event with up to 12 percent meeting the criteria for PTSD. Kerig, Ward, Vanderzee, and Moeddel (2009) reported that the prevalence of adverse childhood experiences among adjudicated youth has shown to be eight times higher than community samples (Kerig et al., 2009; Robertson, Baird-Thomas, & Stein, 2008). Compared to juvenile offenders who reported only one trauma, juveniles reporting 5.4 traumas were approximately eight times more likely to have PTSD, seven times more likely to have depression, and over six times more likely to have clinical problems with substance abuse (Rosenberg et al., 2014). Further, emerging research suggests that severity of delinquent behaviors might be associated with the severity of PTSD symptoms (Becker & Kerig, 2011).

Delinquent youth may experience chronic and pervasive traumatic stressors rather than singular adverse events (Vergano, Lauriola, & Speranza, 2015; Ford, Grasso, Hawke, & Chapman, 2013). Such chronicity and/or multiphasic etiology of trauma yield differing developmental consequences (Vergano, Lauriola, & Speranza, 2015; Kerig, 2013; Ford et al., 2013). Chronic trauma exposure can impact the types of defense mechanisms/coping strategies employed by youth in order to successfully navigate prolonged stressors or toxic environments (Bennett & Kerig, 2014). Such coping mechanisms can manifest as emotional numbing and/or dissociative reactions – posttraumatic symptomology typically resulting from Type II or Type III traumas (Terr, 1991; Kerig, 2013; Soloman & Heide, 1999). In line with complex trauma reactions, juvenile offenders may develop callous-unemotional traits in response to chronic emotional reactivity/arousal (Bennett & Kerig, 2014; Kerig et al., 2012).

Experiencing chronic trauma exposure can establish and reinforce modes of behavior, often drastic, as a means to cope and survive (Ford et al., 2006). Such “survival” or “victim coping” may manifest as callous and defiant traits (Bennett & Kerig, 2014; Ford et al., 2006; Dodge et al., 1995). As a consequence, delinquent youth may experience difficulties processing feelings of anxiety (Bennett & Kerig, 2014). Such self-protective assertions may yield engagement in delinquent behaviors (Patterson, 1993) and, over time, can lead to a “life-course-persistent” lifestyle of criminality inextricably linked to both perpetrating and experiencing repeated traumas (Ford et al., 2006; Moffitt, 1993). It is interesting to note that Jencks and Burton (2013) found that anxiety significantly decreased the relation between being victimized and aggressing against others. This suggests that how a youth processes post-trauma feelings of anxiety may, in some capacity, affect future expressions (or lack thereof) of delinquency (Jencks & Burton, 2013).

Taken together, exposure to trauma and posttraumatic symptom onset are associated with issues unique to the adjudicated youth population (Perkins, Calhoun, Glaser, & Kunemund, 2016). The development of posttraumatic symptoms characteristic of Type II or Type III traumas can distort one's intrapsychic awareness regarding the full impact of their trauma exposure(s) (Kerig & Bennett, 2013). Such impact on one's awareness may affect the relative accuracy with which one identifies or labels an event(s) as traumatic (Kerig & Bennett, 2013). This likely reduces the detection sensitivity of instruments evaluating the impact of previous adverse experiences (Kerig, Moeddel, & Becker, 2011).

Given the elevated rates of PTSD among youth in detention centers, Abram et al. (2007) strongly argued for improved trauma screenings to inform appropriate treatment services. Indeed, research has demonstrated the need for trauma assessments sensitive in detecting complex trauma symptoms among juvenile offenders (Ford, 2011). Yet, further work is needed to develop such measures (Kerig, Moeddel, & Becker, 2011). Moreover, despite robust evidence establishing the relation between adverse childhood events and engagement in delinquent behavior, assessments for trauma and/or posttraumatic stress reactions are not routinely administered in standard mental health screenings for adjudicated youth (Kerig, 2013; Ford, Chapman, Hawke, & Albert, 2007).

TRAUMA AND MENTAL HEALTH OF JUVENILE OFFENDERS

Research indicates that children with developmental trauma regularly present with comorbid diagnoses (Spinazzola et al., 2005). When examining a sample of incarcerated youth, Teplin et al. (2002) found that 38 percent of female offenders met the diagnostic criteria for either oppositional defiant or conduct disorder, while 31 percent of male offenders met similar criteria. Correspondingly, more current research has found comparable rates of psychiatric

disorders among adjudicated youth (*see* Fazel, Doll, & Langström, 2008; Kopp et al., 2009; King et al., 2011).

In reviewing survey results involving 13,778 male and 2,972 female offenders, Fazel, Doll, and Langström (2008) found numerous mental health concerns. Among adjudicated males, 3.3 percent were diagnosed with psychotic illness, while 10.6 percent were diagnosed with major depression. Further, 11.7 percent of adjudicated males were diagnosed with ADHD, while 52.8 percent were diagnosed with conduct disorder. Among adjudicated females, 2.7 percent were diagnosed with psychotic illness, while 29.2 percent were diagnosed with major depression. Moreover, 18.5 percent of adjudicated females were diagnosed with ADHD, while 52.8 percent were diagnosed with conduct disorder (CD) (Fazel, Doll, & Langström, 2008). As a diagnosis of conduct disorder typically precedes manifestation of psychopathy or antisocial personality disorder, these elevated CD rates are consistent with the elevated base rates of antisocial personality disorder observed in the adult prisoner population (Kopp et al., 2009). Interestingly, Ford et al. (2000) found that the social and emotional impairments resulting from traumatic stress reactions were more severe in children with oppositional behaviors than children with affective and/or ADHD symptoms.

International research elucidates that rates of psychiatric disorders among adjudicated youth range from 70 to 90 percent (Colins et al., 2009). Other prevalence rates indicate that juvenile offenders exhibit psychiatric disorders ranging from 40 to 82 percent (Cohen et al., 2010; Lyons et al., 2001) compared to the nine to 33 percent found within the general population (Lyons et al., 2001; Wood et al., 2002). These rates of psychiatric disorder onset are three to four times higher than the general adolescent youth population (Merikangas et al., 2010). Adjudicated youth were found to be two to three times more likely to present with a mental health disorder (Grisso & Underwood, 2004) and 10 times more likely to present with psychotic

illness than the general population (Fazel, Doll, & Langström, 2008). These rates remain high even when controlling for elevated rates of conduct disorder (Teplin et al., 2002). As a result, the past decade has seen an increase in the attention drawn to the unmet mental health needs of juvenile offenders (Becker, Kerig, Lim, & Ezechukwu, 2014).

With respect to PTSD comorbidity, Rosenberg et al. (2014) found that 26.3 percent of juvenile offenders presented with comorbid depression and substance abuse. Specifically, Rosenberg et al. (2014) found that in addition to PTSD, 49.4 percent of juvenile offenders met criteria for depression while 61.2 percent meet the criteria for substance abuse. Not surprisingly, trauma exposure was statistically associated with all three disorders. This is consistent with findings of both Adams et al. (2013) and Wolff and Shi (2012) that delinquents are more likely to report previous PTSD, major depressive disorder, and alcohol and non-experimental drug abuse compared to their non-delinquent peers. Similarly, Ford et al. (2006) also concluded that youth with more severe maltreatment demonstrated elevated levels of PTSD, depression, and delinquency.

Relational Mechanisms Between Trauma and Delinquency

Ford et al. (2006) identified that adjudicated youth may experience emotions in extremes (i.e. unmanageable or absent) (Ford et al., 2006; Ford, 2002). These emotional extremes yield behaviors ranging from pervasive indifference to hostility toward others. Such fluctuations can result in distorted views of one's self, others, and social relations (Ford et al., 2006), which may in turn increase psychopathology (D'Andrea et al., 2012). For example, Young and Widom (2014) found that individuals with childhood trauma were less accurate in processing emotional valence of positive and neutral pictures when compared with matched controls. This finding may relate to the impact of trauma-related anxiety on information processing (Young & Widom, 2014; Tyrka et al., 2013).

Research demonstrates that trauma-related anxiety may result in diminished functional connectivity between the prefrontal cortex and amygdalar regions of the brain; this functional connectivity in turn can affect higher order cognitive functions and emotion/fear based processing and learning (Tyrka et al., 2013). Such difficulties are associated with deficits in self-regulation and in expressions of reactive aggression (Ford et al., 2006). Expressions of anger and aggression in conjunction with delinquent peer exposure have been shown to mediate the relation between trauma and delinquency (Maschi, Bradley, & Morgan, 2008). This finding falls in line with previous research indicating that strain from anger and frustration in reaction to external events results in engagement in delinquent behavior (Agnew, 1985). Given that emotional regulatory disturbances involve dysfunction of one's ability to regulate internal experiences and interact with others (Briere & Spinazzola, 2005), adjudicated youth with past trauma experiences are less likely to successfully navigate social relationships (DePrince, Chu, & Combs, 2008).

Becerra-García (2014) found that offenders with trauma demonstrated impairments in psychomotor functioning and cognitive flexibility. Detrimental behavioral patterns and neurocognitive deficits may result from deleterious neurodevelopmental trajectories relating to childhood trauma(s) (Teicher et al., 2003; Glenn & Raine, 2013). Some of the commonly observed neurocognitive impairments found within these populations relate to cognitive flexibility (Miura, 2009; Spann, et al., 2012), selective attention, working memory, response inhibition (Spann et al., 2012; Kerr, Tremblay, Pagani, & Vitaro, 1997), set shifting (Spann et al., 2012; Syngelaki et al., 2009), and language-processing ability (Tung & Chhabra, 2011), among others.

Experiencing interpersonal victimization can yield maladaptive cognitions oriented around self-blame, helplessness, hopelessness, expectations of being socially rejected, and overestimating the frequency of threats (Briere & Spinazzola, 2005; Foa et al., 1999). These

types of cognitions are typically developed in the context of sustained abuse or neglect, which yield complex internal working models of self and other (Bowlby, 1988). Such social learning from primary persons within the youths' environment facilitates the acquisition of self-regulatory skills (Ford & Blaustein, 2013). Poorly formed or integrated working models can yield aggressive behaviors, which may proceed through maladaptive encoding of information (Crick & Dodge, 1994) and deleteriously impact one's self-regulatory capacities (Ford et al., 2012; D'Andrea et al., 2012).

Difficulties engaging internal self-regulatory mechanisms can be exacerbated by multiple maltreatment experiences (Ford et al., 2012). Exposure(s) to such maltreatment place youth at risk for cognitive priming toward reactive aggression (Dodge et al., 1995; Ford et al., 2012) and engagement in criminal behavior (Ford et al., 2012). Other executive control mechanisms impacted by poor self-regulation are the ability to maintain attention and manage impulsive or hyperactive behaviors (Ford et al., 2006). Further, difficulties with self-regulation also relate to poor response inhibition (Carrion et al., 2008), disturbances of attention and memory, inability to concentrate, and disrupted ability to plan and problem solve (D'Andrea et al., 2012). Such disturbances result in difficulty understanding social interactions; for example, youth may experience difficulties with perspective-taking, expectations of harm from others, and poor understanding of boundaries (DePrince, Chu, & Combs, 2008). However, as Ford et al. (2006) notes, "what may seem to be a deficit in thinking may be a preoccupation with solving survival problems that requires extreme clarity and creativity but which are invisible to people who have not experienced traumatic victimization" (p. 18).

Trauma as a Risk Factor for Delinquency Among Juveniles

Recent research by Tam, Abrams, Freisthler, and Ryan (2016) indicates that youth involved in child welfare who are adjudicated tended to be given more punitive punishments

than their non-child welfare-involved peers. At the same time, research indicates that the various negative experiences of delinquent youth within the juvenile justice system exacerbate the risk of further delinquency (Onifade et al. 2014; Lambie & Randell, 2013). As such, this combination may trigger a transactional spiral that increases in the probability of engaging in delinquent behavior (Barrett et al., 2014b; Becker & Kerig, 2011; Baglivio et al., 2016; Patterson, 1993). Research suggests that this pattern likely relates to the higher rates of recidivism reported within this population (Baglivio et al., 2016; Barrett et al., 2014a; Wang, Li, & Hu, 2008; Cottle, Lee, & Heilbrun 2001).

From a sociological perspective, Dembo, Schmeidler, and Childs (2007) found that variables relating to a youth experiencing physical or sexual victimization were self-identifying as African-American, being female, having an arrest history, and reporting a friend group involved in illicit substance use. In addition, researchers found that a family history of alcohol use, illicit substance use, and mental health concerns were also variables associated with victimization (Dembo, Schmeidler, & Childs, 2007). Roberts Baird-Thomas, and Stein (2008) found that family problems in conjunction with early abuse experiences influenced initial involvement in drug use and delinquent behaviors, such as committing property and/or person offenses (Roberts, Baird-Thomas, & Stein, 2008; Maschi, Bradley, & Morgan, 2008). Researchers found that after these behaviors became established, such behaviors tended to persist (Roberts, Baird-Thomas, & Stein, 2008).

These interacting processes also intersect with the idiosyncrasies and individual characteristics of the youth (Jaffee et al., 2007). In other words, youth offenders can serve as both the victims and architects of the their pathway toward juvenile delinquency; these paths can initiate with attention or impulsivity problems (resulting from interactions with environmental, genetic, and epigenetic factors (Jaffee et al., 2007)), and then escalate into chronic delinquency

(Patterson, 1993; Moffitt, 1993). Taken together, this complex transactional framework with intersecting genetic, temperamental, familial, and community-based influences significantly impact the probability of a youth engaging in delinquent behavior (Jaffee, Caspi, Moffitt, & Taylor, 2004; Roberts, Baird-Thomas, & Stein, 2008; Ford et al., 2006; Patterson, 1993).

TRAUMA EVALUATION METHODOLOGY

In response to the burgeoning awareness of the prevalence, scope, and impact of childhood and adolescent trauma, researchers and practitioners have established several empirically validated instruments to evaluate trauma-related symptomology. With respect to dimensionality, trauma measures more typically fall into three general areas of measurement (Stand, Sarmiento, & Pasquale, 2005). These areas/domains include: single event-related trauma (e.g. natural disasters, vehicle collisions, etc.); interpersonal trauma (i.e. physical, emotional, and/or sexual abuse, and/or neglect); and community-based violence (e.g. war, gang-related violence, etc.). While some trauma assessment tools tabulate the occurrence of event-specific traumas corresponding to the aforementioned domains, other measures focus on the onset, frequency, and severity of resulting symptoms (Eklund et al., 2018; Strand, Sarmiento, & Pasquale, 2005).

For example, the *Childhood Posttraumatic Stress Disorder Interview* (CPTSDI; Fletcher, 1996) is a 40-minute clinical interview assessment that is used with youth to evaluate diagnostic PTSD related criteria relating to both event-specific exposure and the severity general trauma-related symptomology (Carlton, 1997). By contrast, the *Checklist of Sexual Abuse and Related Symptoms* (C-SARS; Spaccarelli, 1995; Spaccarelli & Fuchs, 1997) is a 70-item measure that evaluates trauma symptomology relating specifically to one type of traumatic event(s) (i.e. sexual abuse). More generally, the *Life Events Checklist* (LEC; Gray, Litz, Hsu, & Lombardo,

2004) that measures the frequency of exposures to multiple exposures to trauma-related events without explicitly evaluating trauma-related symptoms.

Evaluation tools can also diverge on the primary focus of trauma-symptom detection (i.e., general symptom detection, specific trauma-related symptom detection, and/or symptom-based diagnostic specification). For example, the *Childhood Trauma Questionnaire* (CTQ; Bernstein et al., 1994) is a 28-item scale that evaluates general trauma-related symptomology. The CQT does not directly subsume PTSD-related criteria, but rather focuses on the onset of general symptoms empirically shown to relate to trauma (Bernstein et al., 1994). Whereas the *Adolescent Dissociative Experiences Scale* (A-DES; Armstrong et al., 1997) is a 30-item self-report specifically designed to measure dissociative symptoms (i.e. dissociative amnesia, absorption or imaginative involvement, depersonalization or derealization, and passive influence (Kerig, et al., 2016)) and does not provide information of trauma-related symptoms within other domains (Armstrong et al., 1997) – such as anger, anxiety, depression, hyperarousal, hypervigilance, for example (Briere, 1996).

With respect to diagnostic specification, the *ICD-11 Trauma Questionnaire* (ICD-TQ; Cloitre, Roberts, Bisson, & Brewin, in preparation) has been developed to provide information as it specifically pertains to ICD-11 PTSD and CPTSD diagnoses (Karatzias, et al., 2016). Regardless of type of instrument or trauma-related dimension of interest however, all clinicians are advised to incorporate ethically bound considerations within their respective practices (Strand, Sarmiento, & Pasquale, 2005; Koocher & Keith-Spiegel, 2008).

When utilizing specific trauma measures with children and adolescents, Strand, Sarmiento, and Pasquale (2005) advise clinicians to consider the following questions: 1) Does the instrument measure exposure to trauma(s), symptomology, or both? 2) Does the instrument solely assess PTSD, or is it sensitive to a variety trauma related conditions (e.g. complex

trauma, hypoarousal, developmental trauma disorder, etc.)? 3) What is the length of administration and scoring associated with the instrument? And, most importantly for the purpose of this dissertation: 4) *what population(s) was the instrument normed on and does the instrument demonstrate appropriate validity and reliability for that population?* Use of screening measures that adequately address the aforementioned considerations may facilitate appropriate allocation of needed resources for youths with posttraumatic symptomology (Briggs et al., 2013; Kerig, Moeddel, & Becker, 2011; Kira, 2001). These considerations are echoed throughout the literature (*see* Denton et al., 2017; Grisso, 2005; Briere & Spinazzola, 2005).

Evaluating Trauma Among Juvenile Offenders

The primary goal of a trauma history assessment among juvenile offenders is to enable courts to prescribe orders that address the safety and needs of the youth (Ford et al., 2006). The provision of mental health services can aid youth in learning ways to cope and engage life with new skills that help preclude a mere repetition of how they learned to survive their maltreatment (Ford et al., 2006). As such, it is paramount that youth receive in-depth assessments to evaluate their trauma histories and current psychological states (Kerig, 2013; Dembo, Schmeidler, & Childs, 2007; Ford et al., 2006).

Trauma assessment is typically determined with screenings via brief questionnaires and structured diagnostic interview protocols (Kerig, 2013). This is generally considered the “gold standard” of trauma-informed assessment and is recommended for use in the juvenile justice system to ensure provision of trauma-informed treatment (Butcher et al., 2015; Kerig, 2013). However, this process can be taxing on the limited resources of forensic and community mental health agencies (Kerig, 2013). Such limited resources necessitate accurate and reliable screening measures to serve as “alerting functions” for forensic staff (Kerig, Moeddel, & Becker, 2011).

Use of such accurate and appropriate screening measures may facilitate appropriate allocation of needed resources for youths with posttraumatic symptomology resulting from single-event traumas and/or complex trauma reactions (Briggs et al., 2013; Kerig, Moeddel, & Becker, 2011; Kira, 2001). However, at present, trauma-informed assessments are not routine components of standard mental health screenings in most juvenile justice systems across the U.S. (Kerig, 2013). Policy implications have been recommended for employing universal screening for adverse childhood events within high-risk adjudicate youth populations (Baglivio & Epps, 2016). Furnishing and enacting such policy legislation is paramount; accurate assessment and treatment of juvenile offenders with significant trauma histories is fundamental for successful rehabilitation (Wolpaw & Ford, 2004). Baglivio and Epps (2016) go as far as stating, “practitioners are doing a disservice to these youth if neglecting to screen for, and provide or refer for services to address, the multiple exposures experienced” (p. 15).

Several instruments measuring the severity, frequency, and intensity of posttraumatic reactions to distressing events have been validated (Hawkins & Radcliffe, 2006; Strand, Sarmiento, & Pasquale, 2005). For example, the *Complex Trauma Questionnaire—Short Form* (CTQ-SF; Spinhoven et al., 2014). However, current trauma assessment tools demonstrate several limitations for use with adjudicated populations (Perkins et al., 2016; Vergano, Lauriola, & Speranza, 2015**;** Kerig, 2013). By way of example, Traumatic Experiences subscale from the *Massachusetts Youth Screening Instrument, Second Edition* (MAYSI-2 TE; Grisso & Barnum, 2006) is commonly used to screen for PTSD among adjudicated youth (National Center for Mental Health and Juvenile Justice, & United States of America, 2009). However, the language of this measure requires the youth to endorse whether or not they have experienced “rape” or “something very bad” or “terrifying” (Grisso & Barnum, 2006). As a result, youth may underreport

their symptoms (Perkins, 2015) – this is especially important as both male and female offenders have been shown to be greatly unwilling to report sexual abuse (Kerig et al., 2011).

It is important to note however, that Kerig, Moeddel, and Becker (2011) found that the Trauma Experiences subscale on the MAYSI-2 identified PTSD symptomology with 62 to 80 percent accuracies depending on use of cutoff score. Nevertheless, identification of PTSD on this scale required endorsement of experiencing types of single-event traumas (Kerig, Moeddel, & Becker (2011). Specifically, a limitation of many validated and well-established trauma assessment tools is the narrowed conceptualization of trauma – typically focusing on single-event traumas (Kerig, 2013) or limited abuse-types (Vergano, Lauriola, & Speranza, 2015). Using instruments designated for diagnosing PTSD limits the psychometric detection of a breadth of possible trauma symptoms; youth may exhibit atypical symptoms of trauma not necessarily associated with PTSD (Ford, Hartman, Hawke, & Chapman, 2008).

Symptom clusters that are commonly examined with trauma assessments include more "classic" trauma symptoms characteristic of Type I traumas (Terr, 1991) such as re-experiencing, avoidance, and hyperarousal (Kerig, 2013). However, adjudicated youth may present with a wider range of posttraumatic stress reactions (Kerig & Bennett, 2013). This can limit the effectiveness of using measures evaluating traditional diagnostic symptoms (Denton et al., 2016), such as the MAYSI-2 or the *UCLA Posttraumatic Stress Disorder Reaction Index for DSM-IV, Adolescent Version* (PTSD-RI; Pynoos et al. 1998; Steinberg et al., 2013). A possible explanation for fewer classic trauma symptom profiles in adjudicated youth might be found in the chronicity, duration, and/or frequency of trauma exposure(s) (Vergano, Lauriola, & Speranza, 2015).

Currently, the *Trauma Symptom Checklist for Children* (TSCC; Briere, 1996) is one of the most used self-report trauma measures (Strand, Sarmiento, & Pasquale, 2005). The TSCC

demonstrates solid reliability and construct validity as well as good convergent and discriminant validity (Briere, 1996; Nilsson, Wadsby, & Svedin, 2008). Further, the TSCC demonstrates stable psychometric structure when examined with adjudicated youth population (Butcher et al., 2015; Nilsson, Wadsby, & Svedin, 2008). With respect to the trauma detection accuracy of the TSCC, Flaherty (2017) found that the TSCC Anxiety scale predicted the presence or absence of trauma histories among juvenile offenders with roughly 71.7 percent accuracy. However, these findings were unable to be replicated when examined with a larger sample size of adjudicated adolescents (Edner, Glaser, Calhoun, & Kunemund, 2018). With respect to additional measures that show promise in measuring trauma symptoms in adjudicated youth, the *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999), *Behavior Assessment System for Children, Second Edition—Self-Report of Personality* (BASC-2-SRP; Reynolds & Kamphaus, 2004), and *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992) are solid candidates.

CHILD REPORT OF POSTTRAUMATIC SYMPTOMS (CROPS)

The *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999) is a 26-item measure that has demonstrated validity and reliability in assessing a broad range of post-traumatic symptoms in children ages seven to 17 in a various settings (*see* Bocknek, Sanderson, & Britner, 2009; Dyregrov & Yule, 2006; Soberman, Greenwald, & Rule, 2002). The measure screens for a broad range of post-traumatic symptoms found in Fletcher's (1993) meta-analysis of childhood trauma literature as well as symptoms described in the DSM-IV (American Psychiatric Association, 2000). Further, the measure does not require identification of particular incident(s) of trauma (Greenwald & Rubin, 1999). The response format for the measure is a three-point Likert scale (0 = *None*, 1 = *Some*, 2 = *Lots*) and youth are asked to report the severity of their symptoms for the past week. The total score is calculated by

summing the responses with scores greater than or equal to 19 suggesting clinical concern (Greenwald & Rubin, 1999; Soberman et al., 2002).

Greenwald and Rubin's (1999) original validation study of the CROPS found support for a three-factor structure. Factor one consisted of items that describe an array of dysphoric symptoms such as guilt, self-alienation, and wounded sense-of-self. Factor two contained items pertaining to somatic problems, while factor three items mainly relate to intrusive thoughts and avoidance (Greenwald & Rubin, 1999). These findings suggest that pediatric posttraumatic reactions differ from, and are perhaps broader than, posttraumatic reactions seen in adults as measured by DSM-IV criteria (Greenwald & Rubin, 1999).

Numerous studies have established validity and reliability of the CROPS in various languages and across settings (Dyregrov & Yule, 2006); Cronbach's alpha coefficients are reported around .90 (Greenwald & Rubin, 1999; Greenwald et al., 2002; Greenwald, Rubin, Russell, & O'Connor, 2002; Greenwald, 2008; Bocknek, Sanderson, & Britner, 2009) with excellent internal consistency among juveniles in detention settings (Greenwald et al., 2002). It should be noted however, that during investigation of trauma symptoms with a sample of Netherland youth, de Roos et al. (2004) were unable to establish CROPS validity or reliability. That being said, additional studies that were unable to establish psychometric validity with the CROPS were not found in an up-to-date comprehensive review of the literature.

Greenwald and Rubin (1999) demonstrated solid concurrent validity between the CROPS and the *Lifetime Incidence of Traumatic Events—Student Form* (LITE-S; Greenwald & Rubin, 1999) with statistical correlations with the TSCC (Greenwald et al., 2001). Further, research demonstrates that the CROPS is responsive to changes in posttraumatic stress symptoms across settings (Greenwald et al., 2002; Greenwald, 2002; Jaberghadi et al., 2004).

This indicates the CROPS utility in assessing changes in functioning, symptom severity, and responses to treatment.

The CROPS provides several benefits over other validated measures such as the TSCC, MAYSI-2, or the PTSD-RI. Specifically, it provides a time efficient means of screening for posttraumatic stress symptoms, even when a specific traumatic event has not been identified (Greenwald & Rubin, 1999). Despite these strengths, limitations exist with regard to paucity standardization norms outside of community samples; this limitation is furthered as a majority of CROPS studies predominantly consist of community samples (Tsukernik & Zucker, 2005). In addition, some widely cited studies utilizing the CROPS have not yet been subjected to the peer review process (*see* Greenwald, et al., 2001; Greenwald, et al., 2002). As such, additional research is needed to examine the psychometrics of the CROPS in general and with specific populations with high reported incidences of trauma (e.g. juvenile offenders). Please reference Chapter III for a more comprehensive literature review of the CROPS with adjudicated youth and argument for using the CROPS as a population-specific instrument.

BEHAVIOR ASSESSMENT SYSTEM FOR CHILDREN, SECOND EDITION—SELF-REPORT OF PERSONALITY–ADOLESCENT (BASC-2-SRP-A)

The *Behavior Assessment System for Children, Second Edition* (BASC-2; Reynolds & Kamphaus, 2004) comprises Clinical and Adaptive scales that compare a child's behavioral functioning and adjustment with age-matched peers (Reynolds & Kamphaus, 2004). Consisting of 139 items, the BASC-2 generates *T*-scores and percentile ranks to compare an individual's self-ratings to that of his/her age-matched peers. The norms for the BASC-2 are based on a U.S. sample of youth representative of the general population regarding gender, race/ethnicity, parent education, geographic region, and clinical and/or special education classification (Reynolds & Kamphaus, 2004).

The BASC-2 Clinical scales consist of the Attitude to School, Attitude to Teachers, Sensation Seeking, Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Attention Problems, and Hyperactivity subscales (Reynolds & Kamphaus, 2004). The Clinical scales assess maladjustment; high scores on these scales represent behaviors that impair functioning in home, school, peer relationships, and/or community contexts. Clinical scale scores that fall within the 60–69 range imply that a youth is at-risk for experiencing difficulties in a particular area. Scores of 70 and above are considered clinically significant (Reynolds & Kamphaus, 2004).

The BASC-2 Adaptive scales consist of the Relations with Parents, Interpersonal Relations, Self-Esteem, and Self-Reliance subscales (Reynolds & Kamphaus, 2004). The Adaptive scales focus on positive or appropriate behaviors demonstrated by the youth. On these scales, high scores represent positive or desirable characteristics. At-risk scores are those within the 31–40 range, whereas clinically significant scores are less than or equal to 30. In addition to the Clinical and Adaptive scale scores, the BASC-2 also provides five composite scores. BASC-2 Composite scales consist of School Problems; Internalizing Problems; Inattention/Hyperactivity; Emotional Symptoms; and Personal Adjustment (Reynolds & Kamphaus, 2004).

The BASC-2 has demonstrated sound psychometric properties, including solid internal consistency, as well as discriminant and convergent validity (Reynolds & Kamphaus, 2004). Internal consistency coefficient estimates range from $r = .61$ to $r = .90$. With respect to the composite scales, Cronbach's alpha coefficients range from .83 to .95, falling in the moderate to excellent range. Test-retest reliability correlations range from $r = .61$ to $r = .84$ for individual scales and from $r = .74$ to $r = .84$ for composites (Reynolds & Kamphaus, 2004). Reference Chapter IV for a comprehensive literature review of the BASC-2 with adjudicated youth.

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY—ADOLESCENT (MMPI-A)

The *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992) is the most broadly utilized and researched adolescent self-report measure of personality functioning (Handel et al., 2011; Baum, Archer, Forbey, & Handel 2009). Among forensic psychologists working with adolescents within the juvenile justice system, the MMPI-A has been identified as one of the frequently employed personality measures (Archer, Buffington-Vollum, Stredny, & Handel, 2006). The MMPI-A is a structured self-report questionnaire that provides a comprehensive evaluation of personality functioning and psychopathology in adolescents from ages 14 through 18 (Butcher et al., 1992). The MMPI-A includes 478 true/false questions and has demonstrated acceptable test–retest reliability and internal consistency, comparable with the MMPI-2.

The normative sample of the MMPI-A consisted of junior high and high school students from eight states from various geographic regions of the United States (Butcher et al., 1992). The original norming sample consisted of 1,620 adolescents of varying gender, ethnicity, age, and living situation. The clinical sample consisted of 713 adolescents, ages 14 to 18 from a variety of treatment facilities in the Minneapolis area (Butcher et al., 1992). MMPI-A scales are interpreted using uniform *T*-scores derived from the original MMPI-A normative sample (Butcher et al., 1992). *T*-scores equal to or greater than 65 are considered clinically significant, indicating a high probability that scale descriptors apply to the individual of interest. *T*-scores ranging from 60 to 64 are considered moderately elevated (Ben-Porath et al., 2006; Butcher et al., 1992).

The validity scales of the MMPI-A give valuable information about an individual's approach to the test and to the extent responses were distorted (Butcher & Williams, 2000). The Cannot Say (?) scale is the sum of items that were omitted by the respondent or were answered as both true and false. Higher scores indicate the omission of multiple items, which may infer

reading difficulties or life experience limitations of the respondent (Archer, 2005). Both the Variable Response Inconsistency (VRIN) and True Response Inconsistency (TRIN) validity scales are measures of consistency across a respondent's MMPI-A responses (Archer, 2005). The VRIN scale consists of 50 item pairs with either analogous or dissimilar content (Archer, 2005) and indicates the presence of random responding or confusion (Butcher & Williams, 2000). The TRIN scale is comprised of 25 item pairs that assess an individual's tendency to respond in true or false directions independent of item content (Archer, 2005). The F scale consists of 60 items that were endorsed by no greater than 20 percent of the adolescent normative sample, with higher elevations possibly indicating inconsistency, reading difficulties, exaggeration of symptoms, or the presence of serious pathology (Archer, 2016; Butcher & Williams, 2000).

The MMPI-A has demonstrated solid construct validity (Peña, Megargee, & Brody, 1996) and concurrent validity when working with juvenile offender populations (Toyer & Weed, 1998; Peña, Megaree, & Brody, 1996). Further, research has demonstrated discriminant validity between both delinquent and non-delinquent populations (Archer, Bolinskey, Morton, & Farris, 2003; Morton, Farris, & Brenowitz, 2002; Cashel, Rogers, Sewell, & Holliman, 1998). In addition, research has demonstrated acceptable convergent validity when working with juvenile offender samples (Handel et al., 2011). Please reference Chapter V for a more comprehensive literature review of the MMPI-A with adjudicated youth populations and argument for using the MMPI-A as a population-specific instrument.

THESIS SUMMARY

Research demonstrates that traumatic exposure is common among children and adolescents (U.S. Department of Health & Human Services 2013), and unique to the juvenile offender and inmate population (Perkins et al., 2016; Briere, Agee, & Dietrich, 2016). The effects

of trauma on the mental health of juvenile offenders are critical for understanding adjudicated youth, pathways to delinquency, and mechanisms that increase the probability for recidivism. This series of studies evaluates the efficacy of widely used measures when screening for trauma in adjudicated youth and attempts to identify embedded item clusters within these instruments that may identify trauma symptoms in juvenile offenders with greater accuracy. This extends previous research by identifying scales to assess for the presence of traumatic stress specifically for the juvenile offender population (*see* Kerig, Moeddel, & Becker, 2011; Denton et al., 2016; Perkins et al., 2016; Perkins, Calhoun, & Glaser, 2014).

Establishing the validity and reliability of population-specific instruments can increase treatment effectiveness by informing more empirically supported trauma treatments within an economically pressured climate (Butcher et al., 2015; Kerig, 2013). Validation of population-specific instruments also adhere to core values of counseling psychology by demonstrating commitment to personal-environment considerations, awareness and attention to cultural diversity, and individual client characteristics (Delgado-Romero et al., 2012). Further, use of population-specific instruments promotes using best available research (Kazdin, 2006), clinical expertise (Forrest & Campbell, 2012; Goodheart, 2006), and emphasizes the work of psychologists to improve the mental health field (Toporek, Kwan, & Williams, 2012).

CHAPTER III

PREDICTIVE ACCURACY AND FACTOR STRUCTURE OF THE CHILD REPORT OF POSTTRAUMATIC SYMPTOMS (CROPS) AMONG ADJUDICATED YOUTH*

*Edner, B.J., Glaser, B. A., & Calhoun, G. B. (2017). Predictive accuracy and factor structure of the Child Report of Posttraumatic Symptoms (CROPS) among adjudicated youth. *Psychological Trauma: Theory, Research, Practice, and Policy,* doi:10.1037/tra0000303.

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Abstract

Objective: The *Child Report of Posttraumatic Symptoms (CROPS)* is a short and effective trauma assessment tool. However, predictive accuracy of the CROPS in detecting trauma exposure(s) as well as the factor structure of the CROPS has not been examined with the adjudicated youth population. ***Method:*** Retrospective data of 215 adjudicated youth (50.2% males) were used to investigate the predictive accuracy of the CROPS in detecting previous trauma exposures. Researchers examined the factor structure of the CROPS to identify principle components that most strongly contributed to accurate classification. ***Results:*** Logistic regression analyses indicated moderate predictive accuracy (64.2%) in identifying reported trauma histories for the total sample and among both adjudicated males (61.1%) and females (66.4%). Principle components analyses revealed a stable three-factor solution (accounting for 47% of total variance) and yielded a 14-item CROPS factor accounting for 32.3 percent of total variance. The 14-item factor demonstrated improved predictive accuracy over the full 26-item CROPS for the total sample (65.1%) and among adjudicated males (66.7%). ROC curve analyses revealed a cutoff score of seven for females and 10 for males. The gendered cutoff score for trauma detection yielded a sensitivity of 75 percent and specificity of 62.8 percent for females and a sensitivity of 65.5 percent and specificity of 59.5 percent for male offenders. ***Conclusion:*** Overall findings provide moderate support for the utility of the CROPS in accurately identifying previous trauma exposure(s) among adjudicated youth and provide preliminary support for a 14-item version of the CROPS for screening for trauma symptoms in adjudicated youth.

Keywords: Trauma, Assessment, Juvenile offender, CROPS

Introduction

Current research investigating the utility of using both broad and trauma-specific measures for detecting trauma symptoms in adjudicated youth demonstrate varying degrees of success (Perkins et al., 2016; Kerig et al., 2016b; Vergano, Lauriola, & Speranza, 2015; Kerig, Moeddel, & Becker, 2011). Yet, few instruments have been normed on adjudicated populations that demonstrate sensitivity in detecting complex trauma symptomology, more typical of Type II traumas (Perkins et al., 2016; Kerig Moeddel, & Becker, 2011.) To add to this line of inquiry, the 26-item *Child Report of Posttraumatic Symptoms* (CROPS; Greenfield & Rubin, 1999) appears to be a promising candidate. The CROPS is an inexpensive, easy-to-administer screening tool that allows for endorsement of trauma symptoms without requiring youth to identify a specific event (Greenwald & Rubin, 1999). As adjudicated youth have been shown to be resistant to disclosing trauma exposure(s) or lack the insight to identify an event as traumatic, a measure such as the CROPS provides utility with this population (Perkins et al., 2016; Kerig & Bennett, 2011).

The CROPS, along with its corresponding measure – *Parent Report of Post-traumatic Symptoms* (PROPS; Greenwald & Rubin, 1999), is a trauma-screening tool for parents and children with or without an identified trauma (Greenwald & Rubin, 1999). Approximately 52.5 percent to 56 percent of juvenile offenders have demonstrated clinically significant scores on the CROPS (Perkins et al., 2016; Perkins, Calhoun, & Glaser, 2014), which is consistent with the elevated rates of trauma exposure(s)/symptoms within this population (Baglivio & Epps, 2016; Kerig et al., 2012). In addition, use of the CROPS with adjudicated populations has demonstrated excellent internal consistency (Perkins et al., 2016; Perkins, Calhoun, & Glaser, 2014).

Recently, Perkins, Calhoun, Glaser, and Kunemund (2016) used the CROPS as an indicator of trauma symptom severity when examining the utility of the *Behavior Assessment System for Children, Second Edition* (BASC-2; Reynolds & Kamphaus, 2004) in predicting clinical trauma symptoms among juvenile offenders. However, within this study, CROPS scores were not cross-referenced to determine accuracy in identifying the presence or absence of previous trauma histories among participants. Further, the accuracy of the CROPS in predicting previous trauma exposure(s) has yet to be examined and, to date, no examination of the CROPS factor structure with a delinquent population has been reported in the literature. Given that the CROPS is 1) a short, convenient, and effective screening instrument for trauma symptomology, 2) does not necessarily assume symptoms characteristic of Type I traumas, and 3) can be quickly administered to adjudicated youth in both detention and community settings, research is warranted for examining the predicative accuracy and utility of the CROPS for this population. This study contributes to the literature by providing such examination.

Study Aims. The current study addresses two primary aims. First, this study seeks to examine the baseline accuracy of the CROPS in predicting the presence of previous trauma exposure among delinquent youth. For the second aim, this study seeks to examine the factor structure of the CROPS for delinquent youth. Within this aim, higher-order factors will be examined for their unique contribution to accurate classification of the presence or absence of previous trauma exposure(s) among adjudicated youth.

Method

Participants

The study sample consisted of retroactive data of adolescents in a mid-sized southeastern city who were referred by the Department of Juvenile Justice (DJJ) to receive psychological evaluations, treatment services, and/or placement recommendations. Youth

offense types included crimes against person, crimes against property, drug charges, and status offenses.

Participants in this study (*N* = 215) were evenly split by gender; 50.2 percent were male (*N* = 108) and 49.8 percent were female (*N* = 107). The self-identified racial breakdown consisted mainly of African-American participants (*N* = 144; 67%). Remaining sample demographics consisted of 40 White participants (18.6%), 22 Latinx participants (10.2%), and nine participants who identified as Multiracial (4.2%). Age of participants ranged from 12 to 17 years with a mean age of 14.95 (*SD* = 1.18). Refer to Table 1.1.1 and 1.1.2 and Figures 1.1.1 and 1.1.2 for demographic characteristics for total sample and by gender.

Materials

Child Report of Posttraumatic Symptoms (CROPS). The CROPS is a 26-item self-report questionnaire that screens for post-traumatic symptoms found in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994) and within the child trauma literature (Greenwald & Rubin, 1999; Fletcher, 1993). The questionnaire is normed for children and adolescents between the ages of seven to 17 years and is formatted in a 3-point Likert-type scale (zero = *none*, one = *some*, and two = *lots*). Scores range from zero to 52; cutoff scores of 19 or higher indicate clinical concern and can be interpreted as significant (Soberman, Greenwald, & Rule, 2002; Greenwald & Rubin, 1999). The CROPS has demonstrated solid construct and criterion validity with high internal consistency and test-retest reliabilities across several studies (*see* Bocknek, Sanderson, & Britner, 2009; Dyregrov & Yule, 2006; Soberman, Greenwald, & Rule, 2002). Within the current study, Cronbach's reliability coefficients indicated high internal consistency for the total sample (alpha = .91) and by gender for both males (alpha = .88) and females (alpha = .92).

Procedure

All participants in this study were mandated by the state of Georgia to receive psychological evaluation or counseling services following adjudication. Caregivers of all participants included in this study provided informed consent for participant data to be used for research purposes. Master and doctoral level students in training completed all clinical intake interviews and clinical case notes, and doctoral level students completed all psychological evaluations. The Internal Review Board (IRB) of the University of Georgia approved all procedures for this study.

Demographic information and juvenile justice history was gathered through clinical interviews, court referral information, and Juvenile Tracking System (JTS) data. Participants were included in the current study if they met the following criteria: 1) the CROPS was completed during intake or psychological evaluation and 2) if information regarding the incidence of previous trauma exposure(s) was provided during intake, during the course of the psychological evaluation, or during the course of therapy.

This study defined trauma as direct or vicarious exposure to and/or experiencing violent or stressful event(s) (Maschi, 2006) prior to initial adjudicated offense(s). Event(s)/experience(s) falling within this definition of trauma were informed by current literature and include: physical abuse and/or sexual abuse (American Psychiatric Association, 2013); physical and/or emotional neglect (Logan-Greene & Jones, 2015); experiences of loss/separation (Harnisher et al., 2015); witnessing domestic violence (Baglivio & Epps, 2016); experiencing more than one of the aforementioned trauma types; or singular traumatic events reported by JTS data.

Acquired data indicated that 115 (53.5%) youths were reported to have experienced at least one previous trauma and of the participants with trauma history, the majority endorsed having experienced multiple types of trauma (45; 39.1%). Remaining participants were reported

to have experienced only one type of trauma. Specifically, 16 youths had abruptly experienced the loss of a loved one (13.9%), 15 youths presented with history of witnessing domestic violence (13%), 14 youths presented with history of sexual abuse/assault (12.2%), 11 youths presented with history of physical abuse (9.5%), eight youths experienced a singular traumatic event as reported by JTS data (6.9%), and three youths presented with history of physical or emotional neglect (2.6%). Refer to Table 1.1.1 and 1.1.2 and Figures 1.1.1 and 1.1.2 for demographic characteristics of the total sample and by gender.

Data Analysis

The Statistical Package for the Social Sciences (SPSS), JMP Statistical Software, and Microsoft Excel was used for data storage, statistical analyses, and data visualization. Prior to analysis, data were screened for univariate outliers (removal if $Z > 3.2$ for standardized values) and multivariate outliers using Mahalanobis distances (removal if $p < .001$). No outliers were detected.

Cross Tabulation of CROPS Cutoff Score

For the first aim of the study, cross tabulations were performed using chi-square tests of independence with the CROPS cutoff score (non-significant or significant) and reported trauma history (presence or absence); tests were performed with the total sample and by gender with 95 percent confidence.

Results

The use of the CROPS cutoff score to classify reported trauma history was significant for the total sample, χ^2 (1, 215) = 18.30, $p < .001$; a medium effect size was indicated ($\varphi = .29$). When split by gender, the relation between these variables was significant for both males, χ^2 (1, 108) = 5.02, $p = .025$, and females, χ^2 (1, 107) = 11.93, $p = .001$. The relation for males

indicated a small to medium effect size (φ = .22) while the relation for females indicated a medium effect size (φ = .33), respectively. In all, results indicate that the CROPS cutoff score correctly classified the presence or absence of reported trauma history among adjudicated youth; magnitude of relation was small to medium for males and medium for females. Refer to Table 1.2 and Figures 1.2.1 – 1.2.3 for chi-square tests of independence results for both male and female offenders.

Regarding diagnostic efficacy statistics (Streiner, 2003), the CROPS cutoff score yielded 30.6 percent false positives and 40.2 percent false negatives with a sensitivity of 59.1 percent and specificity of 70 percent. When split by gender, cutoff scores yielded 38.5 percent false positives and 39.1 percent false negatives for males and 25.4 percent false positives and 41.7 percent false negatives for females. For males, diagnostic efficacy statistics revealed a sensitivity of 47.1 percent and specificity of 73.7 percent. For females, findings revealed a sensitivity of 68.8 percent and specificity of 65.1 percent. Among this sample of juvenile offenders, the CROPS cutoff score demonstrated lower statistical accuracy when compared to Greenwald and Rubin's (1999) original non-adjudicated norming sample, which demonstrated 26 percent false positives and 25 percent false negatives.

Logistic Regression of CROPS Total Score

To determine the predictive accuracy of the CROPS total score, logistic regression analyses were conducted for the total sample and by gender with 95 percent confidence. Analyses also estimated the odds of previous trauma disclosure based upon change in CROPS total score. To evaluate goodness of fit of the model, Hosmer and Lemeshow tests were performed; results indicated no conflict with model assumptions of fit ($p > .05$). In addition, to identify outliers, analogs of Cook's influence statistics were computed; all Cook's distances fell below 0.5.

Results

When examining the total sample, the CROPS total score statistically predicted whether or not youth will have a reported trauma history with 64.2 percent accuracy, Wald χ^2 (1, 215) = 19.24, $p < .001$. The odds ratio of 1.072 indicates that juvenile offenders were 1.072 times more likely to have a reported trauma history for every one point increase in their CROPS total score. When split by gender, the CROPS total scores for females significantly predicted whether or not a youth reported a history of trauma with 66.4 percent accuracy, Wald χ^2 (1, 107) = 13.26, $p <$ .001, with an odds ratio of 1.087. Likewise, CROPS total scores for males significantly predicted whether or not a youth reported a history of trauma with 61.1 percent accuracy, Wald χ^2 (1, 108) = 4.36, $p = .037$, and an odds ratio of 1.05. Refer to Table 1.3 and Figures 1.3.1 and 1.3.2 for summary of logistic regression analyses for the total sample and by gender.

Principle Components Analysis of CROPS Items

For the second aim of the study, a principle components analysis (PCA) was performed. A PCA was selected to identify components explaining nearly all of total variance (Bryant & Yarnold, 2000). To achieve simple structure, an oblique promax rotation with Kaiser normalization was used; this type of rotation was selected under the expectation that factors would be highly correlated within an overarching construct (pediatric posttraumatic stress symptomology) (Greenwald & Rubin, 1999). Indeed, factor correlations generally exceeded the Tabachnick and Fidell (2007) threshold of .32, suggesting 10 percent or more variance overlap, warranting use of an oblique rotation (Tabachnick & Fidell, 2007). To assess factorability, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed; this revealed a KMO statistic of .89, above the commonly recommended value of .60. In addition, Bartlett's test of sphericity was significant, χ^2 (276) = 1950.84, $p < .001$. Given these overall indicators, PCA was deemed to be suitable with all 26 items of the CROPS.

Results

Given that our sample contained at least 200 observations, a scree test was used for determining the appropriate number of eigenvectors to extract (Stevens, 1986; Cattell, 1966). Three factors were retained before an observed gradual decent of eigenvalues. Two items were removed due to low factor loadings (< .32) and lack of salient factor differentiation; a 3-factor model held with salient factor loadings with the 24 remaining CROPS items. The three extracted factors explained 32.3 percent (14 items), 7.4 percent (six items), and 7.3 percent (four items) of the variance, respectively. This solution is desirable because of the leveling off of eigenvalues following the three-factor extraction in conjunction with the modest portion of explained variance. Refer to Tables 1.4.1 – 1.4.2 for PCA factor loadings, inter-correlations, and Figures 1.4.1 – 1.4.2 for depiction of Scree Plot and three-dimensional scatterplot of components.

Results of the PCA reveal three stable factors that explain 47 percent of the total variance of the model. The CROPS 3–Factor model demonstrated good to excellent reliability and internal consistency. With respect to intraclass correlation, Cronbach's alpha coefficients were as follows: Factor one (r = .88); Factor two (r = .81); and Factor three (r = .71). When split by gender, male offenders yielded the following Cronbach's coefficients: Factor one (r = .86); Factor two (r = .76); and Factor three (r = .64). Female offenders yielded the following reliabilities: Factor one (r = .89); Factor two (r = .83); and Factor three (r = .76).

With respect to measure length alteration, Spearman-Brown coefficients were as follows: Factor one (r = .88); Factor two (r = .76); and Factor three (r = .71). When split by gender, male offenders yielded the following Spearman-Brown coefficients: Factor one (r = .87); Factor two (r = .68); and Factor three (r = .64). Female offenders yielded the following reliabilities: Factor one (r = .88); Factor two (r = .79); and Factor three (r = .78). Refer to Tables 1.6.1 – 1.6.5 for item reliabilities for the CROPS for the total sample and by gender and group.

With respect to spilt-half reliability, Guttman Split-Half coefficients were as follows: Factor one (r = .88); Factor two (r = .81); and Factor three (r = .67). When split by gender, male offenders yielded the following Guttman Split-Half reliability coefficients: Factor one (r = .88); Factor two (r = .77); and Factor three (r = .61). Female offenders yielded the following reliabilities: Factor one (r = .90); Factor two (r = .82); and Factor three (r = .73). Together, results indicate high internal consistency and reliability with respect to intraclass correlations, measure length, and split-half reliability for both the total sample and across genders. Refer to Tables 1.5 and 1.6 for descriptive and reliability statistics for the CROPS and corresponding factors for the total sample and by gender.

After reviewing the 14 identified items in Factor one, item content appeared to address affective symptoms underlying traumatic stress reactions. For example, items such as “I feel sad or depressed,” “I find it hard to concentrate,” “I feel all alone,” and “I am nervous or jumpy” address symptoms relating to depression and anxiety that have been recurrently shown to relate to trauma symptomology (Price et al., 2013; Kerig, 2013). After reviewing the six items in Factor two, item content appeared to address the psychosomatic and dissociative responses related to traumatic stress reactions. These symptoms can be observed in items such as “I ‘space out’ when people are talking to me,” “I daydream,” “I get headaches,” and “I feel sick or have pains.” Finally, the content of the four identified items in Factor three appeared to address avoidance reactions. This construct can be observed in the items, “I try to forget about bad things that have happened,” “I avoid reminders of bad things that have happened,” and “I do special things to make sure nothing bad happens.”

Logistic Regression of CROPS 3–Factor Model

In order to analyze the identified factors, items in each factor were added together for a cumulative factor score. To identify the predictive accuracy of the CROPS 3–Factor model,

logistic regression analyses were utilized for the total sample and by gender; logistic regression analyses were interpreted with 95 percent confidence. Analyses also estimated the odds of trauma having been reported based upon change in CROPS total score. To identify outliers, analogs of Cook's influence statistics were computed for each logistic regression; all Cook's distances fell below 0.5. To evaluate goodness of fit, Hosmer and Lemeshow tests were performed; results indicated no conflict with model assumptions of fit ($p > .05$). Finally, variance inflation factors (VIFs) fell below the recommended value of 2.5, indicating no evidence of multicollinearity within the model.

Results

When examining the 3-factor model with the total sample, logistic regression analyses revealed that only the 14-item factor statistically predicted a reported trauma history, Wald χ^2 (1, 215) = 12.826, $p < .001$. The odds ratio for Factor one was 1.139, indicating that adjudicated youth were 1.139 times more likely to have previously experienced trauma for every one point increase on their 14-item factor score. The six-item factor and four-item factors were not statistical predictors. The overall accuracy of the 3-factor model for predicting a reported trauma history was 65.1 percent.

When examining the 3-factor model split by gender, logistic regressions revealed that the model was statistically predictive of reported trauma histories for both males, Wald χ^2 (3, 108) = 11.53, $p = .009$, and females, Wald χ^2 (3, 107) = 7.21, $p = .008$, with accuracies of 66.7 percent and 66.4 percent. However, the 14-item factor was the only statistical predictor for both males and females among the sample of adjudicated youth. Specifically, Factor one for males, Wald χ^2 (1, 108) = 7.21, $p = .008$, and females, Wald χ^2 (1, 107) = 15.40, $p = .002$, were statistically predictive of reported trauma history at the alpha = .05 level. For Factor one, logistic regression analyses computed an odds ratio of 1.154 for males and 1.125 for females. For both

male and female offenders, Factors two and three were not statistical predictors of reported trauma history. These findings indicate that the 14-item factor of the CROPS provides the strongest contribution for accurately classifying previous trauma histories among youth offenders.

Findings provide preliminary support for use of a 14-item version of the CROPS in screening for trauma symptoms when working with offender populations. Refer to Table 1.7 for summary of logistic regression output and Figures 1.5.1 to 1.5.3 for nominal logistic fit for trauma classification using the CROPS for both the total sample and among male and female offenders.

ROC Curve of CROPS 14-Item Factor

Authors computed a receiver operating characteristic (ROC) curve to distinguish a cutoff value to maximize accurate classification of group membership. Sensitivity and specificity were calculated at all possible cutoff points (Becker et al., 2004). Authors also conducted an area under the curve analysis (AUC) to determine association between CROPS 14-Item Factor scores and group membership. Due to a statistical mean difference between male and female offenders on the CROPS 14-Item Factor (T = -2.82, p = .005; d = 0.38), separate ROC curve analysis were performed by gender. Refer to Figure 1.6 for a graphic depiction of mean comparison and density plots.

Results

For female offenders, ROC analysis indicated that the CROPS 14-Item Factor differentiated female offenders by reported trauma history with moderate accuracy (Akobeng, 2007), AUC = .729, $p < .001$. Inflection values with the highest sensitivity and specificities of group assignment fell at coordinates 5.5 and 6.5, respectively. For male offenders, ROC analysis indicated that the CROPS 14-Item Factor differentiated male offenders by reported

trauma history with moderate accuracy, AUC = .662, $p = .004$. Inflection values with the highest sensitivity and specificities of group assignment fell at coordinates 9.5 and 10.5, respectively. Authors used a CROPS 14-Item Factor cutoff score of six to discriminate female offenders and a cutoff score of 10 for male offenders by reported history of trauma. Refer to Table 1.8.1 and 1.8.2 for ROC curve coordinates and Figures 1.7.1 and 1.7.2 for graphic depiction of ROC curves.

Cross Tabulation of CROPS 14-Item Factor Cutoff

To examine the predictive utility of the gendered cutoff scores for the CROPS 14-Item Factor, cross tabulations were computed using chi-square tests of independence with 95 percent confidence.

Results

CROPS 14-Item factor cutoff scores statistically classified both adjudicated males and females with reported trauma history at the alpha = .05 level. For adjudicated females, the cutoff score of greater than or equal to seven statistically classified youth with reported trauma history, χ^2 (1, 107) = 15.28, $p < .001$; a large effect size was indicated ($\varphi = .38$). For adjudicated males, the cutoff score of greater than or equal to 10 statistically classified youth with reported trauma history, χ^2 (1, 108) = 5.32, $p = .021$; a small to medium effect size was indicated ($\varphi = .22$). Results indicate that the CROPS 14-Item factor cutoff scores correctly classified the presence or absence of reported trauma history among adjudicated youth. Refer to Table 1.9 for results of the chi-square test of independence for the CROPS 14-Item cutoff scores.

Regarding diagnostic efficacy statistics for adjudicated females, the CROPS 14-Item factor cutoff score yielded 16 false positives and 16 false negatives with a sensitivity of 75 percent and specificity of 62.8 percent. Authors computed likelihood ratios in order to calculate the odds of the CROPS 14-item factor cutoff score accurately classifying female offenders.

Results revealed a positive likelihood ratio (LR^+) of 2.02. This indicates that female offenders that endorse more than six points (out of a possible 28 points) are 2.02 times more likely to have experienced a previous trauma. In contrast, results revealed a negative likelihood ratio (LR^-) of 0.4. This indicates that female offenders that endorse fewer than seven points are 0.4 times more likely to have experienced a previous trauma.

For adjudicated males, the CROPS 14-item factor cutoff score yielded 10 false positives and 32 false negatives with a sensitivity of 65.5 percent and specificity of 59.5 percent. Results of likelihood ratios revealed a positive likelihood ratio (LR^+) of 1.62. This indicates that male offenders that endorse more than nine points are 1.62 times more likely to have experienced a previous trauma. In contrast, results revealed a negative likelihood ratio (LR^-) of 0.58. This indicates that male offenders that endorse fewer than 10 points are 0.58 times more likely to have experienced a previous trauma. Refer to Figures 1.8.1 – 1.8.3 for graphic depictions of CROPS 14-item factor cutoff score accuracies among both male and female offenders.

Discussion

The first aim of this study was to examine the predictive accuracy of the CROPS in identifying previous trauma histories in adjudicated youth. The results indicated that the CROPS total score provides modest contribution in predicting the presence or absence of previous trauma. Logistic regression analyses indicate 64.2 percent accuracy in predicting trauma for a combined gender sample, an improvement over the 53.5 percent rate by chance. Further, the modest predicative accuracy of the CROPS remained consistent across genders; accuracy was retained for both male (61.1%) and female offenders (66.4%). These accuracies demonstrate improvement over chance rates of 52.8 percent for male offenders and 59.8 percent for female offenders.

The predictive accuracies of CROPS total scores are generally commensurate with previous work examining the efficacy of trauma assessment scales with adjudicated youth (Murray, Glaser, & Calhoun, 2013; Kerig, Moeddel, & Becker, 2011). By way of example, Kerig, Moeddel, & Becker (2011) found that the Trauma Experiences subscale on the MAYSI-2 identified PTSD symptomology with 62 percent to 80 percent accuracies depending on use of cutoff score. Murray, Glaser, and Calhoun (2013) extracted a 17-item experimental trauma scale from the *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992) that correctly classified 65.5 percent of adjudicated youth with reported trauma histories. In sum, CROPS total score accuracies of approximately 64 percent indicate modest contribution to correctly classifying adjudicated youth with a reported history of trauma. Findings support the utility of the CROPS total score for adjudicated populations for both male and female offenders.

With regard to Greenwald and Rubin's (1999) established cutoff scores, results indicate lower classification accuracies for adjudicated youth when compared to the CROPS original norming sample. For the combined gender sample, findings indicated that a clinically significant CROPS cutoff score of greater than or equal to 19 correctly classified 59.1 percent of adjudicated youth with reported trauma histories and 70 percent of adjudicated youths without reported trauma histories.

Some gender differences emerged when examining the CROPS cutoff score. Specifically, a significant CROPS cutoff score correctly classified 47.1 percent of males and 68.8 percent of females with reported trauma histories; the CROPS correctly classified 73.7 percent of males and 65.1 percent of females without reported trauma. Taken together, CROPS cutoff scores provide moderate accuracy for identifying the presence of previous trauma exposure(s) for female offenders, but not for male offenders. This finding is congruent with previous research demonstrating that female offenders report higher rates of trauma symptoms

compared to male offenders (Perkins et al., 2016; Kerig & Becker, 2012; Abram et al., 2007). Further, the CROPS cutoff score demonstrates moderate specificity in classifying adjudicated youth who have not reported previous trauma exposure(s). Taken together, results reveal the CROPS as providing modest contribution to accurately classifying adjudicated youth with reported histories of trauma.

The second aim of this study was to examine the factor structure of the CROPS with a sample of adjudicated youth. Findings indicated a stable three higher-order factor model accounting for 47 percent of total variance. The three higher-order factors explained 32.3 percent (14 items), 7.4 percent (six items), and 7.3 percent (four items) of the variance with total sample reliability coefficients ranging from alpha = .71 to .88. Reliability for the 3-factor model indicated acceptable to high internal consistency, generally commensurate with the CROPS total score alpha coefficient of .91. When split by gender, male offenders yielded the reliabilities of .86 (Factor one), .76 (Factor two), and .64 (Factor three). Female offenders also yielded the reliabilities of .89 (Factor one), .83 (Factor two), and .76 (Factor three). Results indicate high to acceptable internal consistency.

Item content of the first higher-order factor appeared to address affective symptoms underlying traumatic stress reactions and accounted for 37.3 percent of total variance. This 14-item factor is purported to measure symptoms such as depression, anxiety, and concentration difficulties. Aforementioned symptoms are observed in trauma stress reactions and supported in the literature (Price et al., 2013; Kerig, 2013). Item content of the second higher-order factor appeared to address psychosomatic and dissociative symptoms, both of which relate to traumatic stress reactions (Kerig, et al., 2016b; Fox et al., 2015). This six-item factor accounted for 7.4 percent of total variance. Item content from the third higher-order factor appeared to address preoccupation with, or attempts to avoid, thoughts of previous distressing experiences.

Such avoidance responses, or thought preoccupation yielding avoidance reactions, are common symptoms of trauma found within the literature (Post et al., 2014; Price et al., 2013). This four-item factor accounted for 7.3 percent of total variance.

When examining the three higher-order factors within a logistic model, accuracies in classifying adjudicated youth with reported trauma histories improved for the total sample and by gender. Specifically, logistic regression analyses indicate 65.1 percent accuracy in predicting trauma for a combined gender sample, an improvement over the 53.5 percent rate by chance and the 64.2 percent accuracy of the 26-item CROPS. Interestingly, the 3-factor model did not improve the 66.4 percent accuracy for female offenders. Rather, the 3-factor model improved classification accuracy for male offenders – increasing accuracy from 61.1 to 66.7 percent.

Upon further examination, Factor one was the only significant predictor of reported trauma history classification for the total sample and across both male and female offenders. Specifically, when compared to the 26-item CROPS, the 14-item factor demonstrated an odds ratio improvement from 1.072 to 1.139 for the total sample. When examined by gender, female offenders demonstrated an odds ratio improvement from 1.087 to 1.125, while male offenders demonstrated improvement from 1.050 to 1.154. Results indicate a larger improvement in predictive accuracy for male over female offenders. This finding is novel as female offenders typically endorse more trauma symptoms than their male counterparts on self-report rating scales (Perkins et al., 2016; Kerig & Becker, 2012; Stewart, Livington, & Dennison, 2008). Further, the results suggest that statistical accuracy of the 26-item CROPS is heavily weighted on the 14 items within Factor one. Together, results provide preliminary support for a 14-item version of the CROPS for adjudicated youth that does not sacrifice predictive utility for female offenders and improves the classification accuracy for male offenders when compared to the 26-item version.

When examining the 14-item factor within the framework of a dichotomous trauma classification, results of ROC analyses revealed cutoff scores for both males and females that statistically classified youth with and without a reported trauma history. For female offenders, the CROPS 14-item factor cutoff score of greater or equal to seven yielded a sensitivity of 75 percent and specificity of 62.8 percent. Results indicate that adjudicated females with scores greater or equal to seven were 2.02 times more likely to have experienced a previous trauma; females with scores less than seven were 0.4 times more likely to have experienced a previous trauma. When compared to the established full-scale CROPS cutoff of greater or equal to 19, results indicate that the CROPS 14-item factor cutoff score demonstrates improved sensitivity (68.8% vs. 75%) with generally commensurate specificity (65.1% vs. 62.8%). Together for females, the total CROPS 14-item factor cutoff score indicates commensurate classification accuracy compared to the full CROPS score, while the CROPS 14-item factor cutoff score improves sensitivity while retaining acceptable specificity compared to the conventional 19-point cutoff.

For male offenders, the CROPS 14-item factor cutoff score of greater or equal to 10 yielded a sensitivity of 65.5 percent and specificity of 59.5 percent. Results indicate that adjudicated females with scores greater or equal to 10 were 1.62 times more likely to have experienced a previous trauma; males with scores less than 10 were 0.58 times more likely to have experienced a previous trauma. When compared to the full CROPS cutoff of greater or equal to 19, results indicate that the CROPS 14-item factor cutoff score demonstrates improved sensitivity (47.1% vs. 65.5%) with a rather pronounced reduction in specificity (73.7% vs. 59.5%). Together for males, the total CROPS 14-item factor score indicates improved accuracy over the full-scale CROPS cutoff, while the CROPS 14-item factor cutoff score sacrifices specificity while improving sensitivity compared to the conventional 19-point cutoff.

A number of limitations to the current study should be noted. The sample of adjudicated youth in this study was court referred from a small demographic area; this may limit the generalizability of the findings. As such, future research continuing this line of study require samples from more demographically diverse regions to investigate differences that may exist based on variables such as ethnicity/race, offense type, age, and current detention status. Moreover, reliance on youth self-report may introduce varying degrees of error as well as provide underestimates of symptom severity on trauma incidences (Vergano, Lauriola, & Speranza, 2015).

Youth may be resistant to report exposure to potentially stigmatizing events (Perkins et al., 2016). Ascertaining accurate knowledge of trauma can be further complicated by how youth define their experiences (Kerig, Moeddel, & Becker, 2011) as well as by youth employing emotional avoidance processes in the manifestation of adolescent delinquency (Marsiglio et al., 2014).This concern is amplified given that the CROPS does not have imbedded validity/reliability items to determine profile validity. There is currently no strategy for identifying response inconsistency or biased response styles such as acquiescence or nonacquiescence. Thus, there is a possibility that invalid CROPS profiles were included in the data analysis. Further, as trauma symptom manifest can overlap with other mental health problems such depression, anxiety, obsessive compulsive behavior, etc. (American Psychiatric Association, 2013), it is possible that the CROPS items tapped into other psychiatric symptoms not necessarily related to, or in absence of, previous trauma exposure(s). However, despite these limitations, significant results were found.

The present study contributes to the literature by providing moderate support for the utility of the CROPS in accurately identifying the presence of previous trauma exposure(s) among adjudicated youth. Findings provide preliminary support for a stable three-factor solution

that may aid clinicians in further delineating trauma symptoms in adjudicated youth (i.e. affective symptoms, somatic/dissociative experiences, and avoidance reactions). In addition, compared to the full 26-item CROPS, the 14-item factor demonstrates commensurate statistical accuracy in identifying reported trauma histories among adjudicated females, and improvement for adjudicated males.

Results indicate that cutoff scores for the 14-Item factor demonstrated improved sensitivity for both males and females, while reducing specificity for male offenders. These results suggest that the 3-factor CROPS model and 14-item factor cutoff might increase the detection accuracy of previous trauma exposure(s) and/or trauma symptoms when evaluating adjudicated youth in detention centers and/or other mental health or forensic agencies. Nevertheless, further research is needed to examine the validity of the 3-factor CROPS model in relation to other psychometrically validated instruments. It is important to note that Edner, Glaser, Calhoun, and Piegore (2018) have provided preliminary validation of the CROPS 3–Factor structure with the TSCC with promising results*. However, further examination of the psychometric properties (e.g. convergent and discriminate validity) of the CROPS 3–Factor is needed to empirically establish the revised structure as a viable psychological instrument.

Future studies are advised to cross-validate the CROPS 14-item factor cutoff scores for adjudicated populations. This may increase the efficacy of the measure by examining the stability of the improvements to classification sensitivity. Future studies should seek to procure multiple sources of information in order to maximize accuracy in identifying trauma histories among adjudicated youth. In line with maximizing accuracy, it is recommended that validity items be developed for the CROPS; this may provide criteria for the identification of invalid profiles. In summary, overall findings provide moderate support for the utility of the CROPS in

*Refer to Appendix A for the *Preliminary Validation of the Child Report Of Posttraumatic Symptoms (CROPS) 3—Factor Structure for Adjudicated Youth* study conducted by Edner, Glaser, Calhoun, and Piegore (2018).

accurately identifying previous trauma exposure(s) among juvenile offenders and provide preliminary support for a 14-item version of the CROPS for screening trauma symptomology in adjudicated youth.

Tables and Figures

All data visualization in this section used consistent color-coding to represent sample derivations. The color key used throughout this section is provided below.

- = No reported history of trauma
- = Reported history of trauma via procedural methods discussed in body of manuscript
- = Total sample: Combination of both trauma and non-trauma groups
- = Female gender
- = Male gender
- = Ethnicity

Table 1.1.1.

Demographic Characteristics	Frequency	Percentage
Gender		
Females	107	49.8%
Males	108	50.2%
Trauma History		
No Reported Trauma	100	46.5%
Reported Trauma	115	53.5%
Trauma Type		
Physical Abuse	11	9.5%
Sexual Abuse/Assault	14	12.2%
Neglect	3	2.6%
Grief and Loss	16	13.9%
Witnessed Domestic Violence	15	13.0%
Multiple Traumas	45	39.1%
Single Event Traumas	8	6.9%
Ethnicity		
African American	144	67.0%
Anglo American	40	18.6%
Latinx	22	10.2%
Multiracial	9	4.2%

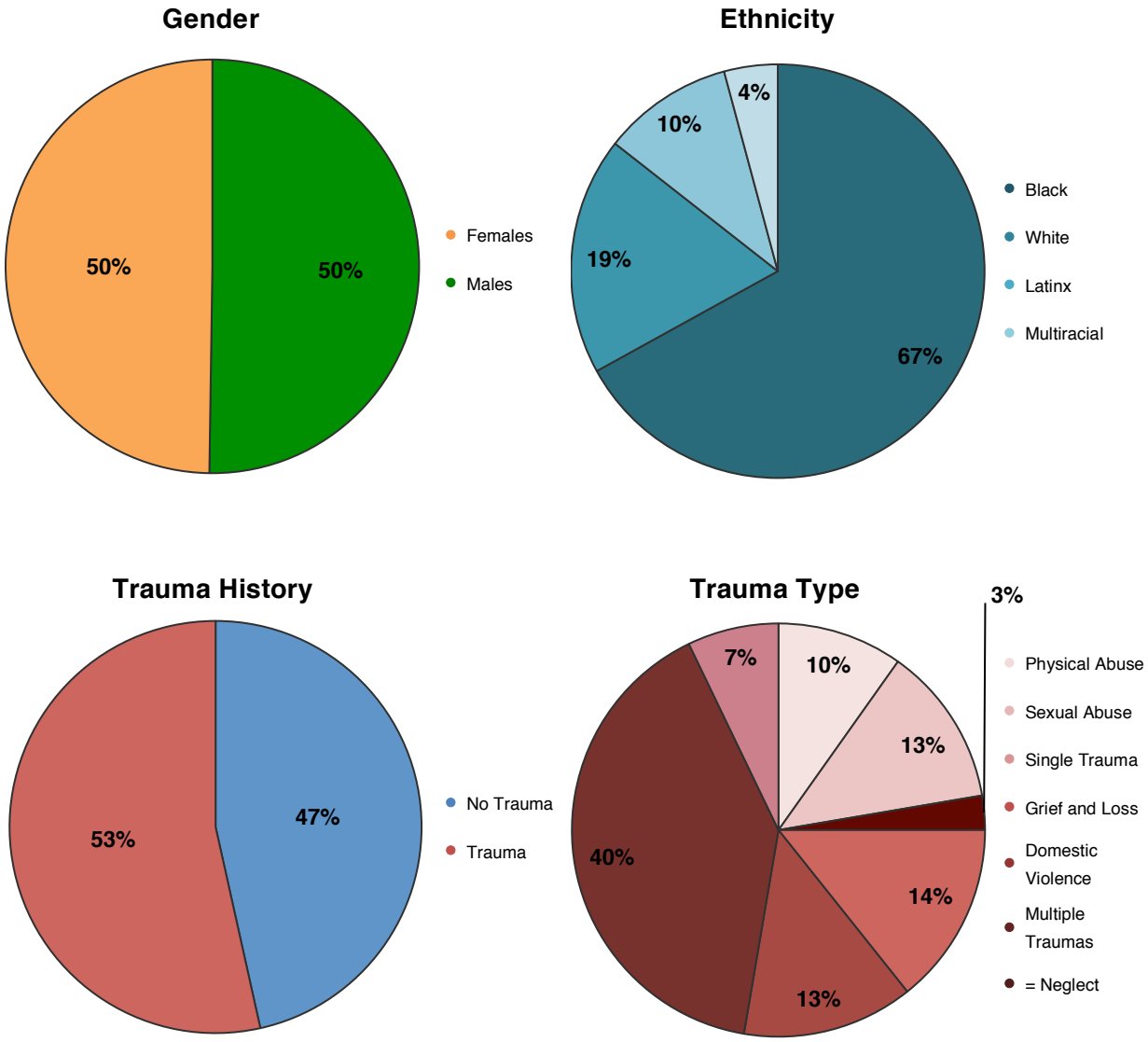


Figure 1.1.1. *Graphic Depiction of Demographic Characteristics*

Table 1.1.2.

Demographic Characteristics by Gender

	Males (*N* = 108)		Females (*N* = 107)	
	Frequency	Percentage	Frequency	Percentage
Trauma History				
No Reported Trauma	57	52.8%	43	40.2%
Reported Trauma	51	47.2%	64	59.8%
Trauma Type				
Physical Abuse	7	13.7%	4	6.3%
Sexual Abuse/Assault	6	11.8%	8	12.5%
Neglect	1	2.0%	2	3.1%
Grief and Loss	6	11.8%	10	15.6%
Witnessed Domestic Violence	6	11.8%	9	14.1%
Multiple Traumas	18	35.3%	27	42.2%
Single Event Traumas	5	9.8%	3	4.7%
Ethnicity				
African American	71	65.7%	73	68.2%
Anglo American	24	22.2%	16	17.4%
Latinx	9	12.7%	13	12.1%
Multiracial	4	3.7%	5	4.7%

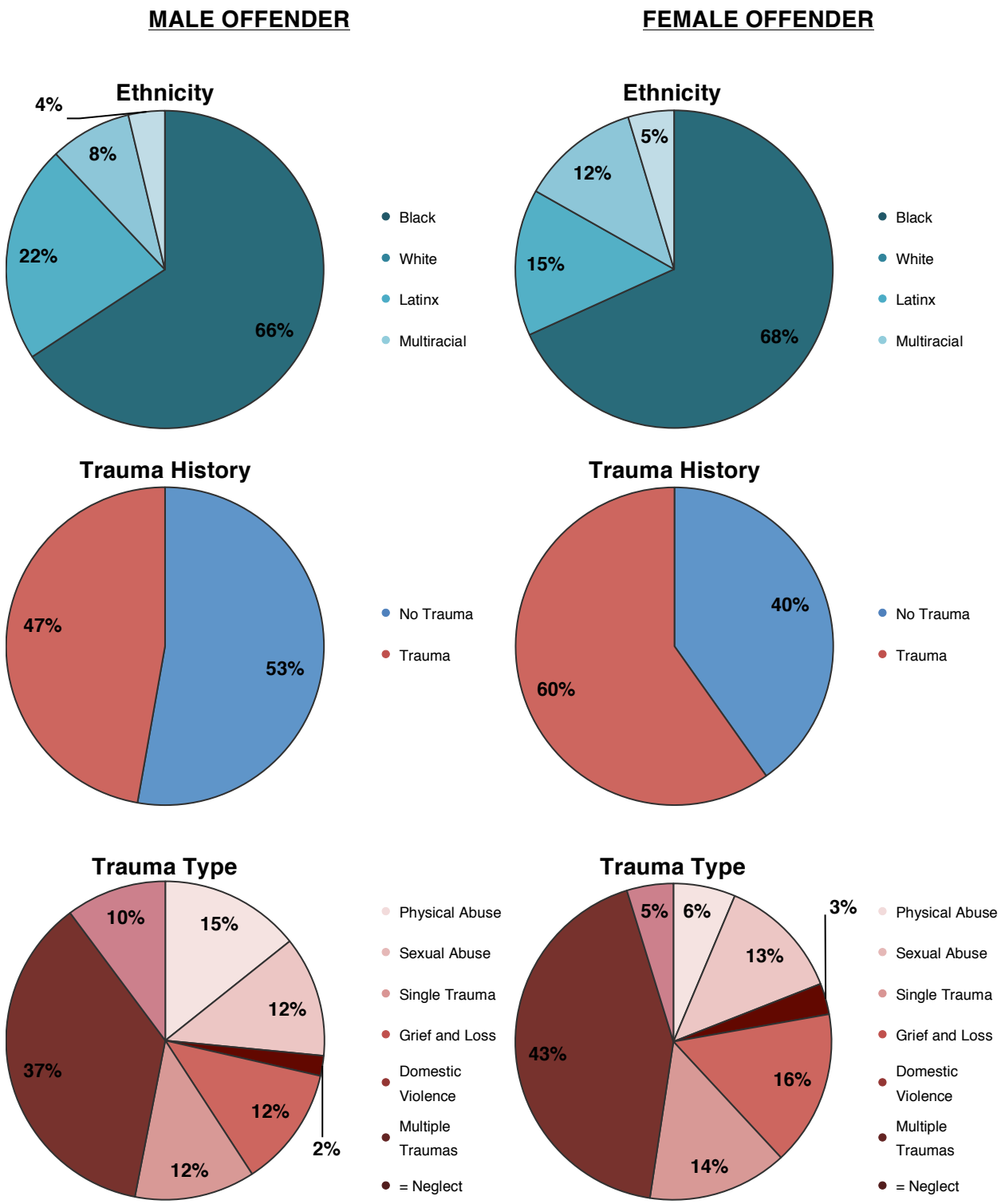


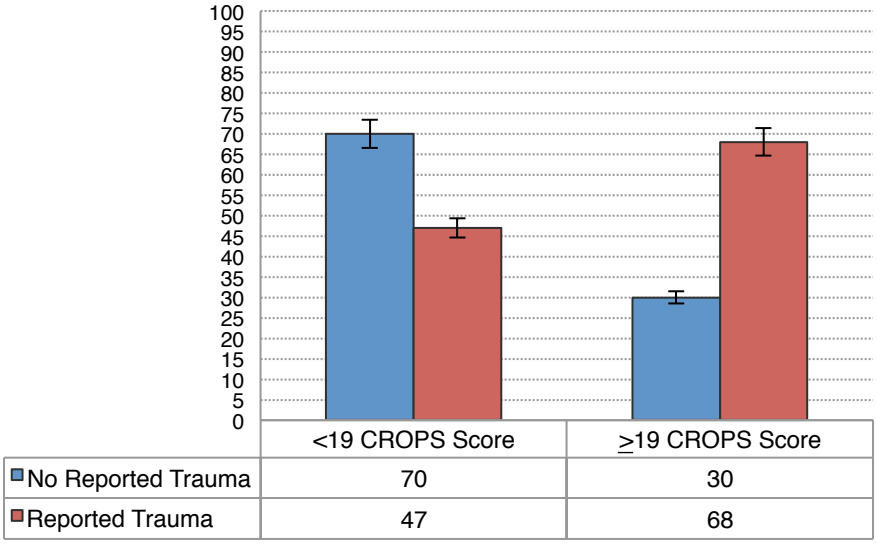
Figure 1.1.2. *Graphic Depiction of Demographic Characteristics by Gender*

Table 1.2.

Cross Tabulation of CROPS Cutoff Scores

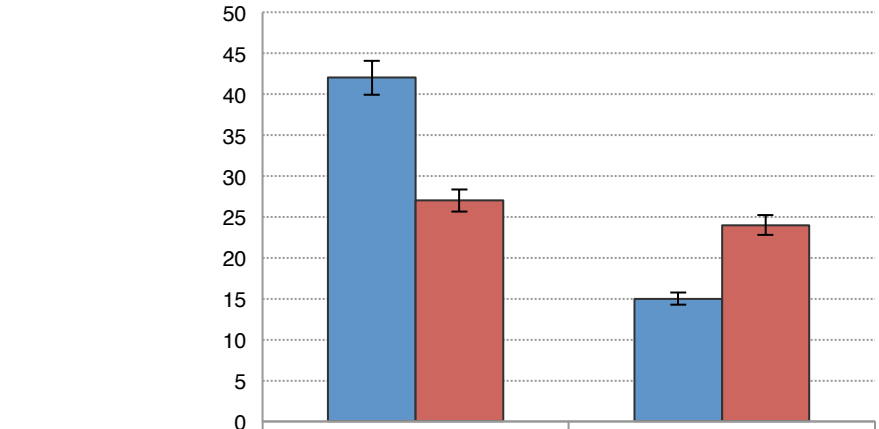
	Cutoff Score				
Trauma History	< 19 points	≥ 19 points	χ^2	φ	*N*
Total Sample					
No	70 (54.4)	30 (45.6)	18.30***	.29	215
Yes	47 (62.6)	68 (52.4)			
Males					
No	42 (36.4)	15 (20.6)	5.02*	.22	108
Yes	27 (32.6)	24 (18.4)			
Females					
No	28 (19.3)	15 (23.7)	11.93**	.33	107
Yes	20 (28.7)	44 (35.3)			

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



** Error bars demarcate a five percent interval of case size to approximate error range*

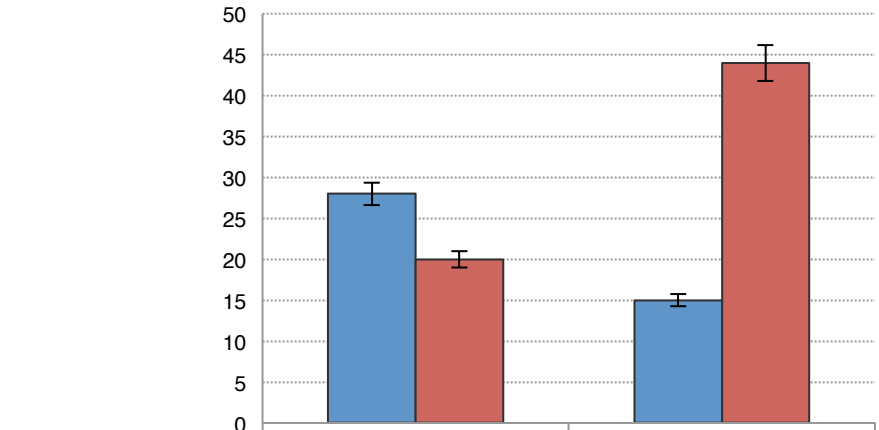
Figure 1.2.1. *CROPS Cutoff Score Classifying Trauma History: Total Sample*



	<19 CROPS Score	≥19 CROPS Score
No Reported Trauma	42	15
Reported Trauma	27	24

** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 1.2.2. *CROPS Cutoff Score Classifying Trauma History: Male Offenders*



	<19 CROPS Score	≥19 CROPS Score
No Reported Trauma	28	15
Reported Trauma	20	44

** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 1.2.3. *CROPS Cutoff Score Classifying Trauma History: Female Offenders*

Table 1.3.

Logistic Regression Output for CROPS Predicting Group Assignment

	Reported Trauma						
CROPS:	β	*SE* β	e^{β}	Wald χ^2	R^2	Accuracy	*N*
Total Sample	.070	.016	1.072	19.24***	.13	64.2%	215
Males	.049	.023	1.050	4.36*	.06	61.1%	108
Females	.084	.023	1.087	13.26***	.19	66.4%	107

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

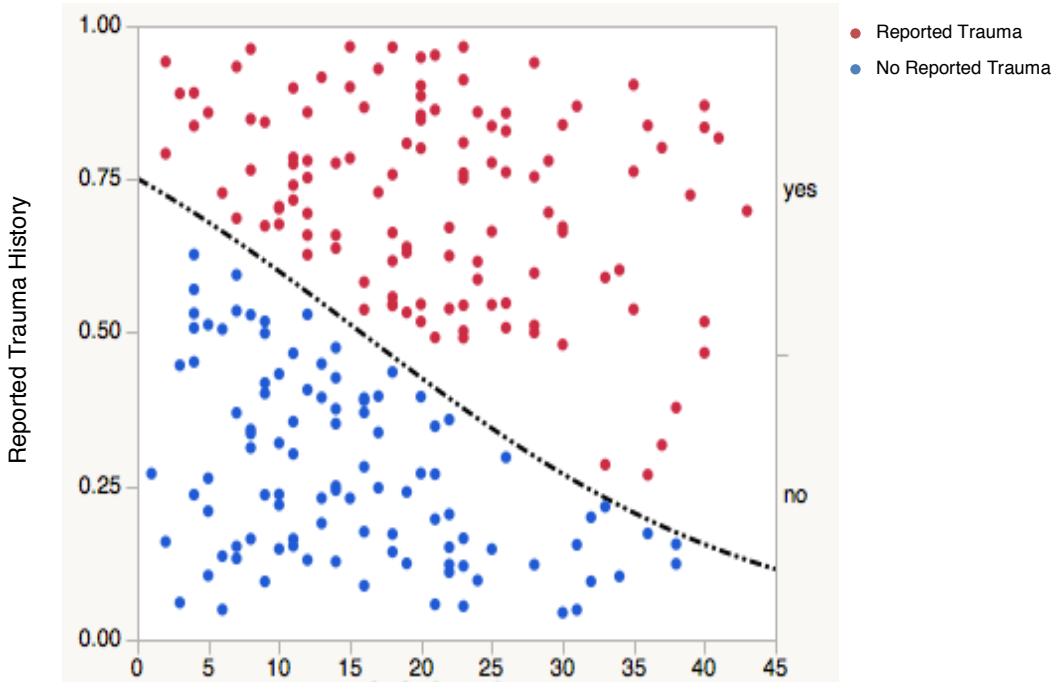


Figure 1.3.1. *Nominal Logistic Fit for CROPS Predicting Group Assignment: Total Sample*

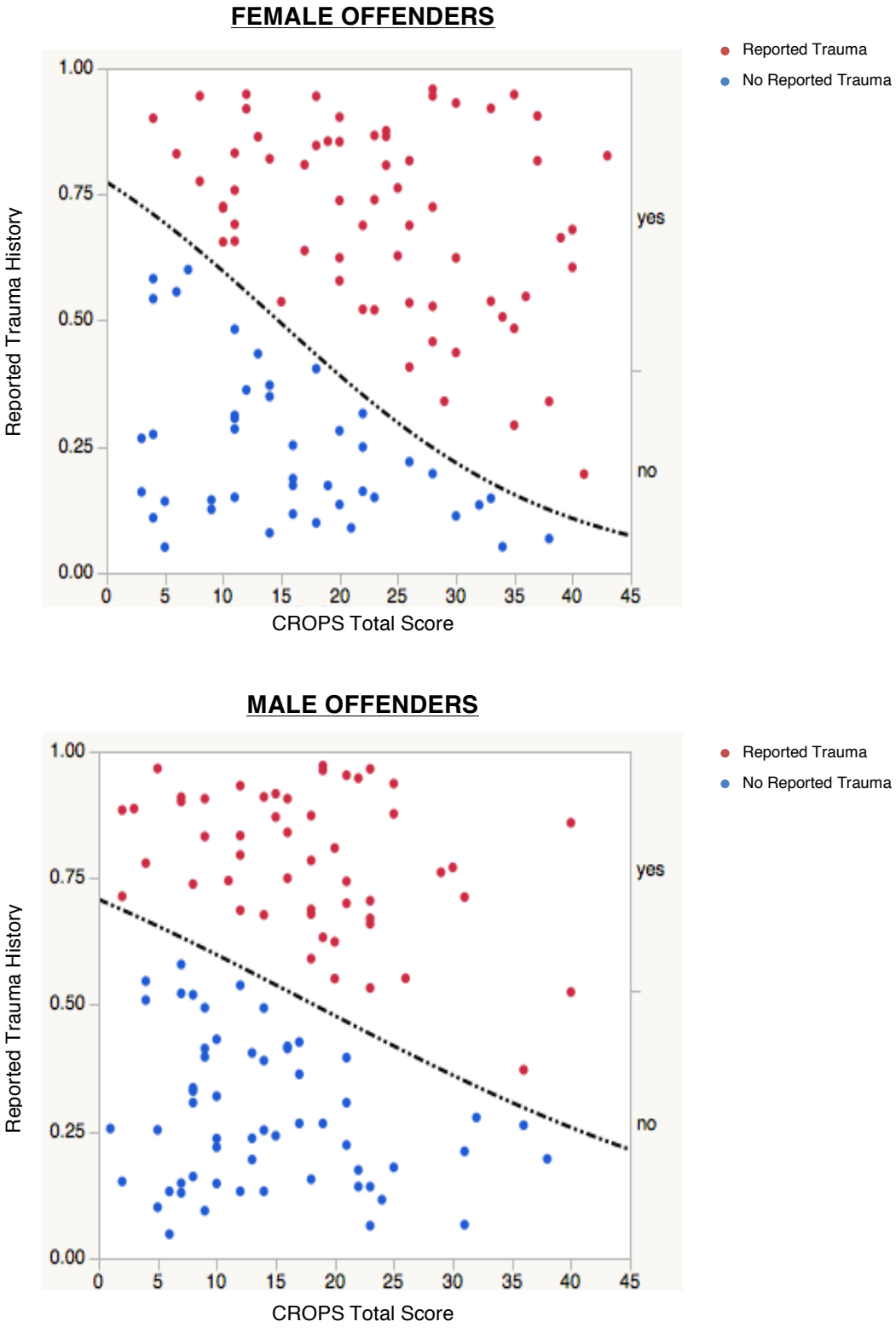


Figure 1.3.2. *Nominal Logistic Fit for CROPS Predicting Group Assignment by Gender*

Table 1.4.1.

Factor Loadings of PCA using for 24 CROPS Items

(N = 215)	Factor 1	Factor 2	Factor 3
I find it hard to concentrate.	**.34**	.27	.01
I worry that bad things will happen.	**.65**	-.05	.23
It is hard for me to go to sleep at night.	**.53**	.05	-.03
I have bad dreams or nightmares.	**.35**	.22	.04
I feel all alone.	**.53**	.27	-.02
I feel strange or different than other kids.	**.65**	-.02	.04
I feel like there's something wrong with me.	**.73**	.14	-.11
I feel like it's my fault when bad things happen.	**.61**	-.00	.09
I'm a jinx, or bad-luck charm.	**.62**	-.29	.09
I feel sad or depressed.	**.53**	.38	-.10
I don't feel like doing much.	**.51**	.21	-.01
My future looks bad.	**.76**	-.10	-.20
I'm on the lookout for bad things that might happen.	**.59**	-.25	.22
I am nervous or jumpy.	**.54**	.21	-.05
I daydream.	.01	**.40**	.18
I "space out" when people are talking to me.	.10	**.58**	.03
I get headaches.	-.11	**.84**	-.10
I get stomach aches.	-.20	**.89**	.11
I feel sick or have pains.	-.13	**.84**	.17
I feel tired or low energy.	.20	**.63**	-.12
I think about bad things that have happened.	.27	.08	**.44**
I try to forget about bad things that have happened.	-.04	.02	**.85**
I avoid reminders of bad things that have happened.	-.02	.05	**.78**
I do special things to make sure nothing bad happens.	.03	.07	**.62**

**Bolded items correspond to primary factor loadings*

Table 1.4.2.

Component Correlation Matrices

Component Inter-Correlation Matrix	Factor 1	Factor 2	Factor 3
Factor One (14 Items)	1.00	-	-
Factor Two (6 Items)	.56	1.00	-
Factor Three (4 Items)	.33	.29	1.00

Three-Component Model Correlation Matrix	CROPS	Factor 1	Factor 2	Factor 3
CROPS Total (26 Items)	1.00	-	-	-
Factor One (14 Items)	.93	1.00	-	-
Factor Two (6 Items)	.80	.62	1.00	-
Factor Three (4 Items)	.65	.39	.45	1.00

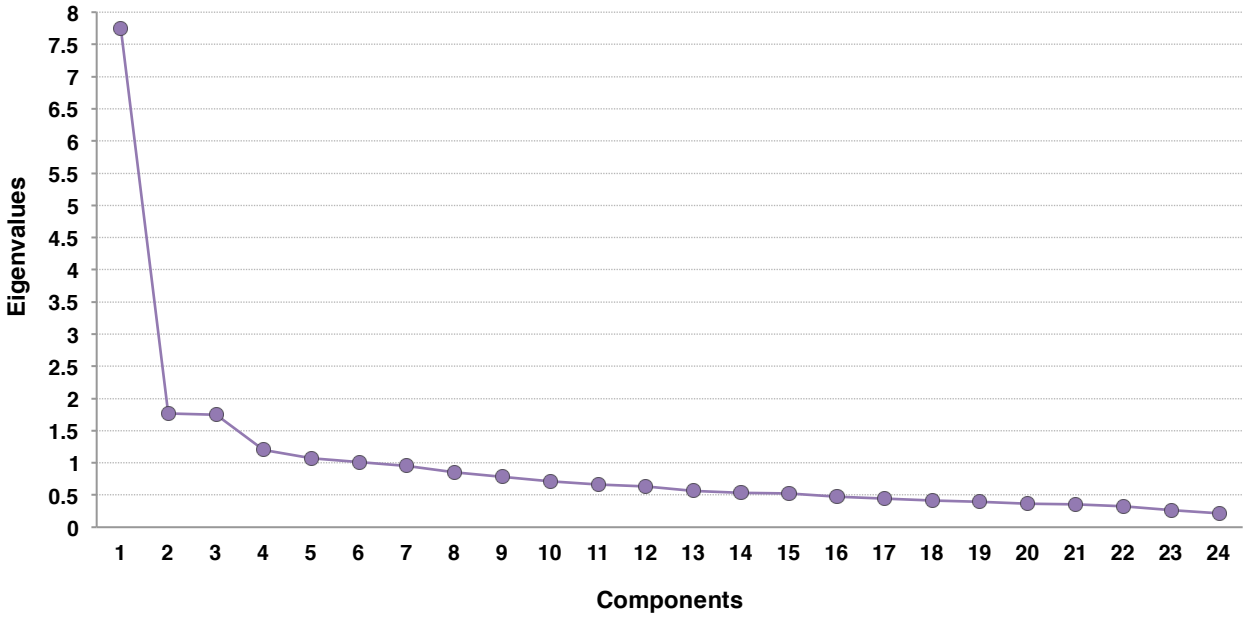


Figure 1.4.1. *Scree Plot of Factor Loadings for 24 Items of the CROPS*

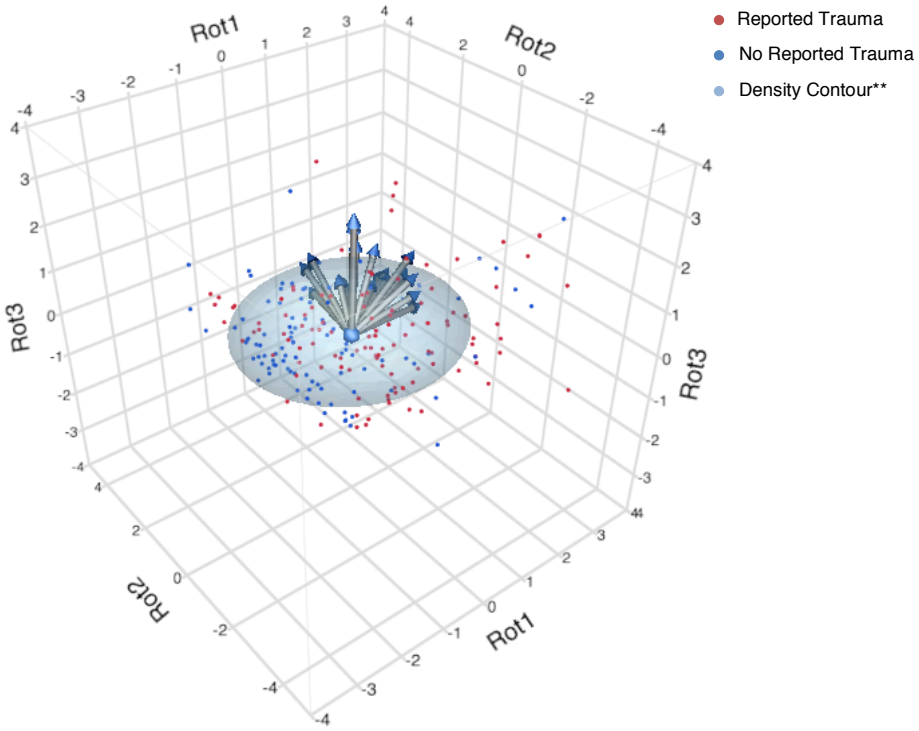


Figure 1.4.2. *Three-Dimensional Scatterplot of CROPS Principle Components**

* 3-D Scatterplot rendered with oblique promax rotation
** Normal contour ellipsoid coverage set at 50%

Rot1 Rotated Principle Component 1
Rot2 Rotated Principle Component 2
Rot3 Rotated Principle Component 3

Table 1.5.

Descriptive Statistics for CROPS Total Score and 3-factor model

Total sample *(N = 215)*	Items	*M*	*SD*	Skewness	Kurtosis
CROPS Total:	26	18.20	9.89	.457	-.525
Factor One	14	7.64	5.82	.704	-.233
Factor Two	6	4.91	3.07	.501	-.443
Factor Three	4	3.73	2.21	-.101	-.895
Male Youth *(N = 108)*	Items	*M*	*SD*	Skewness	Kurtosis
CROPS Total:	26	15.94	8.83	.646	.133
Factor One	14	6.55	5.38	.992	.650
Factor Two	6	4.14	2.77	.646	-.142
Factor Three	4	3.54	2.09	-.006	-.927
Female Youth *(N = 107)*	Items	*M*	*SD*	Skewness	Kurtosis
CROPS Total:	26	20.41	10.42	.214	-.869
Factor One	14	8.75	6.06	.452	-.658
Factor Two	6	5.68	3.17	.314	-.637
Factor Three	4	3.93	2.32	-.223	-.850

Table 1.6.1.

Reliability of the CROPS and 3-factor model: Total Sample and by Gender

CROPS Factors	Cronbach's Alpha	Spearman-Brown	Guttman Split-Half
CROPS Total (26-Items)	.91	.85	.85
Males Offenders	.88	.79	.79
Females Offenders	.92	.88	.88
Factor One (14-Items)	.88	.88	.88
Males Offenders	.86	.87	.88
Females Offenders	.89	.88	.90
Factor Two (6-Items)	.81	.76	.81
Males Offenders	.76	.68	.77
Females Offenders	.83	.79	.82
Factor Three (4-Items)	.71	.71	.67
Males Offenders	.64	.64	.61
Females Offenders	.76	.78	.73

Table 1.6.2.

Item Reliability for the CROPS by Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I daydream.”	.90	.88	.91	.90	.89
“I "space out" when people are talking to me.”	.90	.88	.91	.89	.89
“I find it hard to concentrate.”	.90	.88	.91	.90	.89
“I think about bad things that have happened. ”	.90	.88	.91	.90	.89
“I try to forget about bad things that happened.”	.90	.88	.91	.90	.89
“I avoid reminders of bad things that happened.”	.90	.88	.91	.90	.89
“I worry that bad things will happen.”	.90	.87	.91	.90	.89
“I do special things so nothing bad happens.”	.90	.88	.91	.90	.89
“It is hard for me to go to sleep at night.”	.90	.88	.91	.90	.89
“I have bad dreams or nightmares.”	.90	.88	.91	.89	.89
“I get headaches.”	.90	.88	.91	.89	.89
“I get stomach aches.”	.90	.88	.91	.89	.89
“I feel sick or have pains.”	.90	.87	.91	.89	.89
“I feel tired or low energy.”	.90	.88	.91	.89	.89
“I feel all alone.”	.90	.87	.91	.89	.88
“I feel strange or different than other kids.”	.90	.87	.91	.89	.89
“I feel like there's something wrong with me.”	.90	.87	.91	.89	.88
“I feel like it's my fault when bad things happen.”	.90	.88	.91	.89	.89
“I'm a jinx, or bad-luck charm.”	.90	.88	.91	.90	.89
“I feel sad or depressed.”	.90	.87	.91	.89	.88
“I don't feel like doing much.”	.90	.88	.91	.89	.89
“My future looks bad.”	.90	.88	.91	.90	.89
“I'm on lookout for bad things that may happen.”	.90	.88	.91	.90	.89
“I am nervous or jumpy.”	.90	.87	.91	.89	.88

Table 1.6.3.

Item Reliability for the 14-Item Factor One: By Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I find it hard to concentrate.”	.87	.86	.89	.85	.86
“I worry that bad things will happen.”	.86	.84	.88	.83	.84
“It is hard for me to go to sleep at night.”	.87	.86	.88	.85	.86
“I have bad dreams or nightmares.”	.87	.86	.87	.84	.84
“I feel all alone.”	.86	.85	.88	.84	.85
“I feel strange or different than other kids.”	.87	.85	.88	.83	.85
“I feel like there’s something wrong with me.”	.86	.85	.87	.83	.84
“I feel like it’s my fault when bad things happen.”	.87	.86	.87	.84	.85
“I’m a jinx, or bad-luck charm.”	.88	.86	.89	.84	.86
“I feel sad or depressed.”	.86	.84	.87	.83	.84
“I don’t feel like doing much.”	.87	.86	.87	.85	.85
“My future looks bad.”	.87	.86	.88	.85	.84
“I’m on lookout for bad things that may happen.”	.88	.86	.88	.84	.85
“I am nervous or jumpy.”	.88	.85	.88	.84	.84

Table 1.6.4.

Item Reliability for the 6-Item Factor Two: By Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I daydream.”	.82	.79	.82	.86	.70
“I “space out” when people are talking to me.”	.78	.73	.80	.82	.69
“I get headaches.”	.77	.70	.80	.82	.63
“I get stomach aches.”	.76	.69	.78	.80	.64
“I feel sick or have pains.”	.76	.70	.77	.80	.64
“I feel tired or low energy.”	.78	.71	.80	.82	.68

Table 1.6.5.

Item Reliability of the CROPS 4-Item Factor Three: By Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I think about bad things that have happened.”	.71	.68	.74	.70	.72
“I try to forget bad things that have happened.”	.55	.48	.62	.58	.52
“I avoid reminders of bad things that happened.”	.59	.46	.67	.59	.59
“I do special things so nothing bad happens.”	.69	.62	.76	.67	.71

Table 1.7.

Logistic Regression Output for CROPS 3–Factor Model Predicting Trauma

CROPS: (3-factor model)	Reported Trauma			
	β	*SE* β	e^{β}	Wald χ^2
Combined Gender *(N = 215)*				
Factor One	.130	.036	1.139	12.826***
Factor Two	.033	.061	1.033	.284
Factor Three	-.067	.075	.935	.788
χ^2		25.604***		
Nagelkerke R^2		.15		
Percent Accuracy		65.1%		
df		3		
	β	*SE* β	e^{β}	Wald χ^2
Male Offenders *(N = 108)*				
Factor One	.143	.054	1.154	7.121**
Factor Two	-.001	.091	.999	.001
Factor Three	-.207	.110	.813	3.546
χ^2		11.530**		
Nagelkerke R^2		.14		
Percent Accuracy		66.7%		
df		3		
	β	*SE* β	e^{β}	Wald χ^2
Female Offenders *(N = 107)*				
Factor One	.118	.051	1.125	5.317*
Factor Two	.026	.089	1.026	.084
Factor Three	.070	.108	1.072	.423
χ^2		15.400**		
Nagelkerke R^2		.18		
Percent Accuracy		66.4%		
df		3		

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

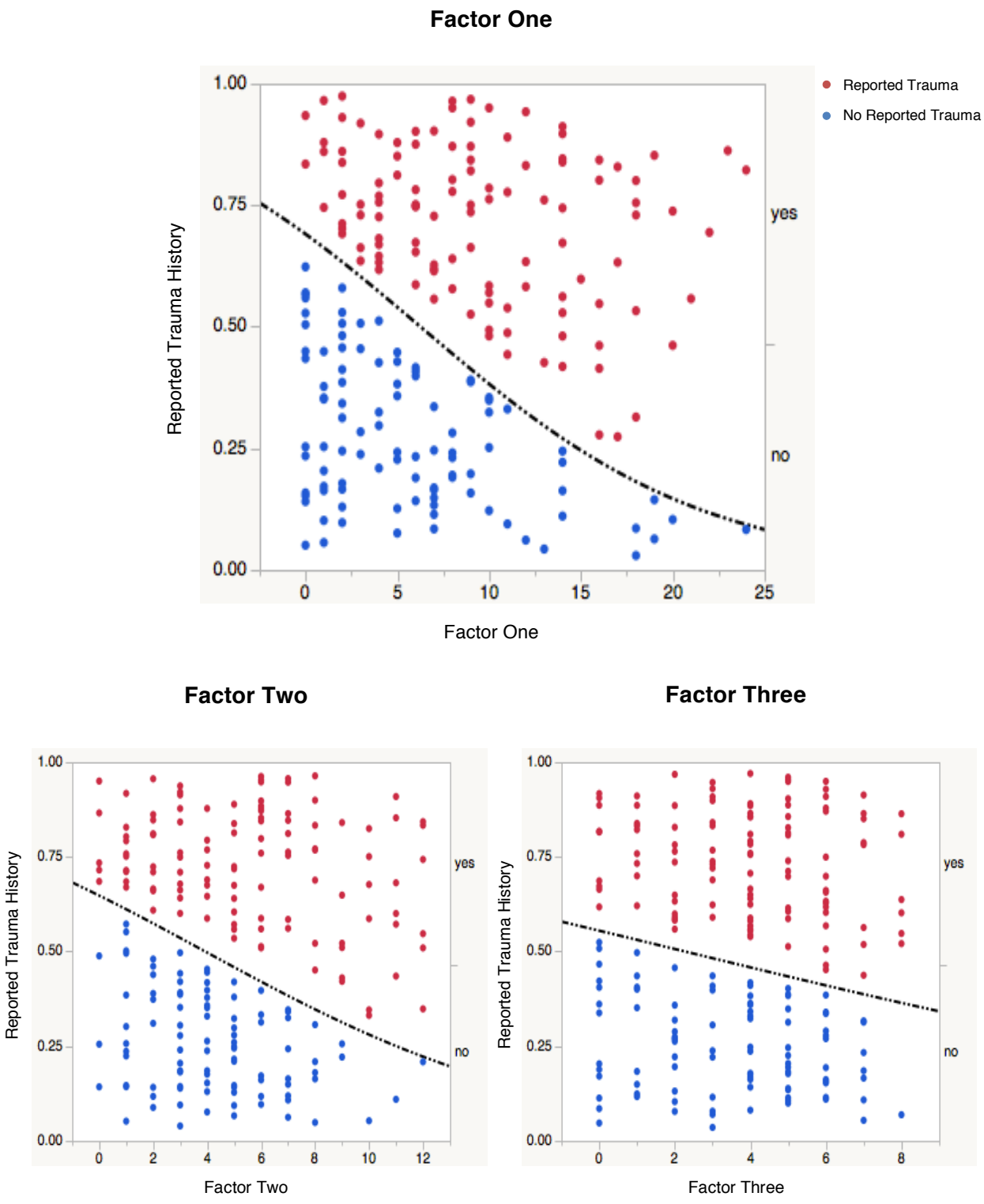


Figure 1.5.1. *Logistic Fit of Three–Factor Model Assigning Group Membership: Combined*

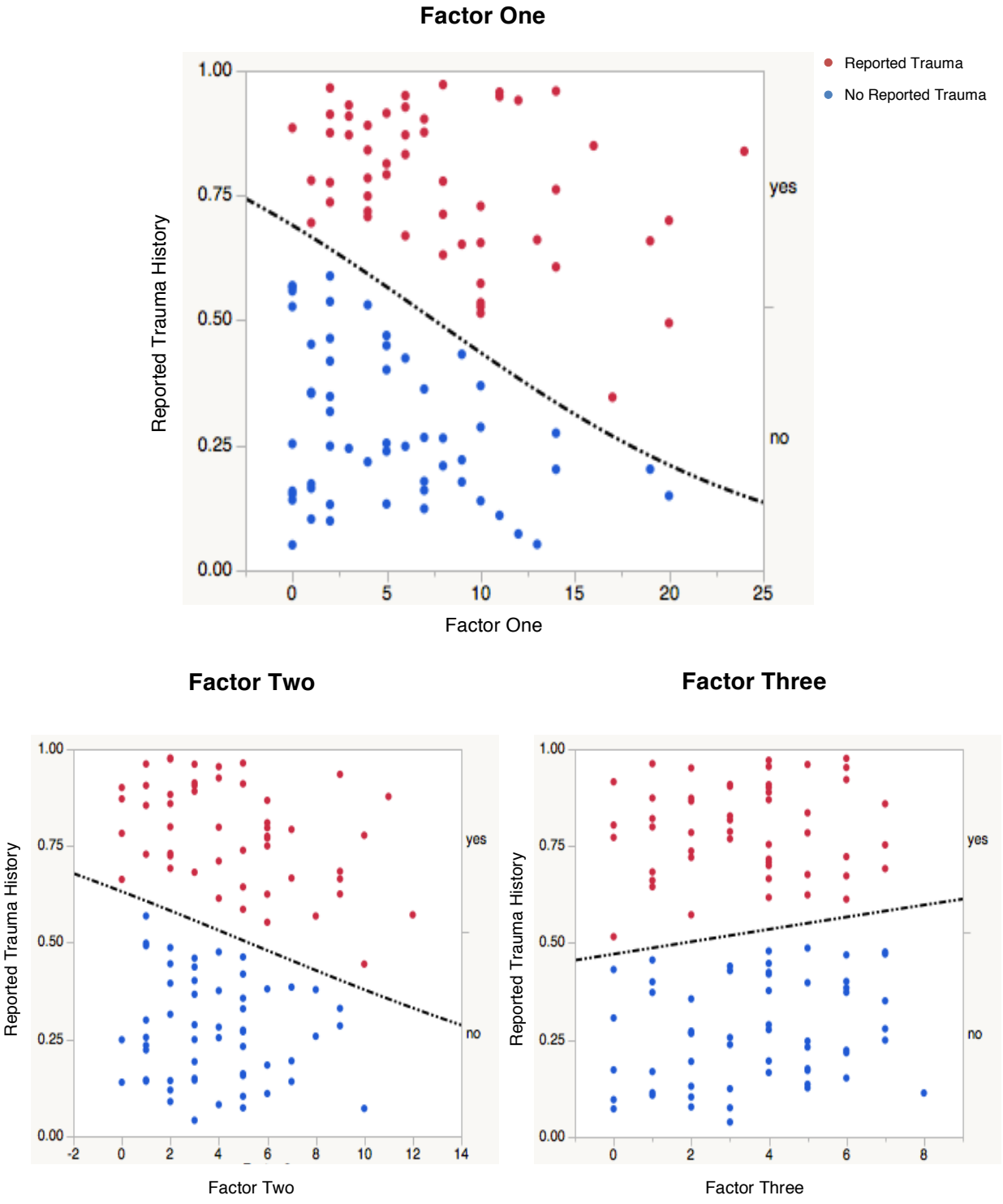


Figure 1.5.2. *Logistic Fit of Three–Factor Model Assigning Group Membership: Males*

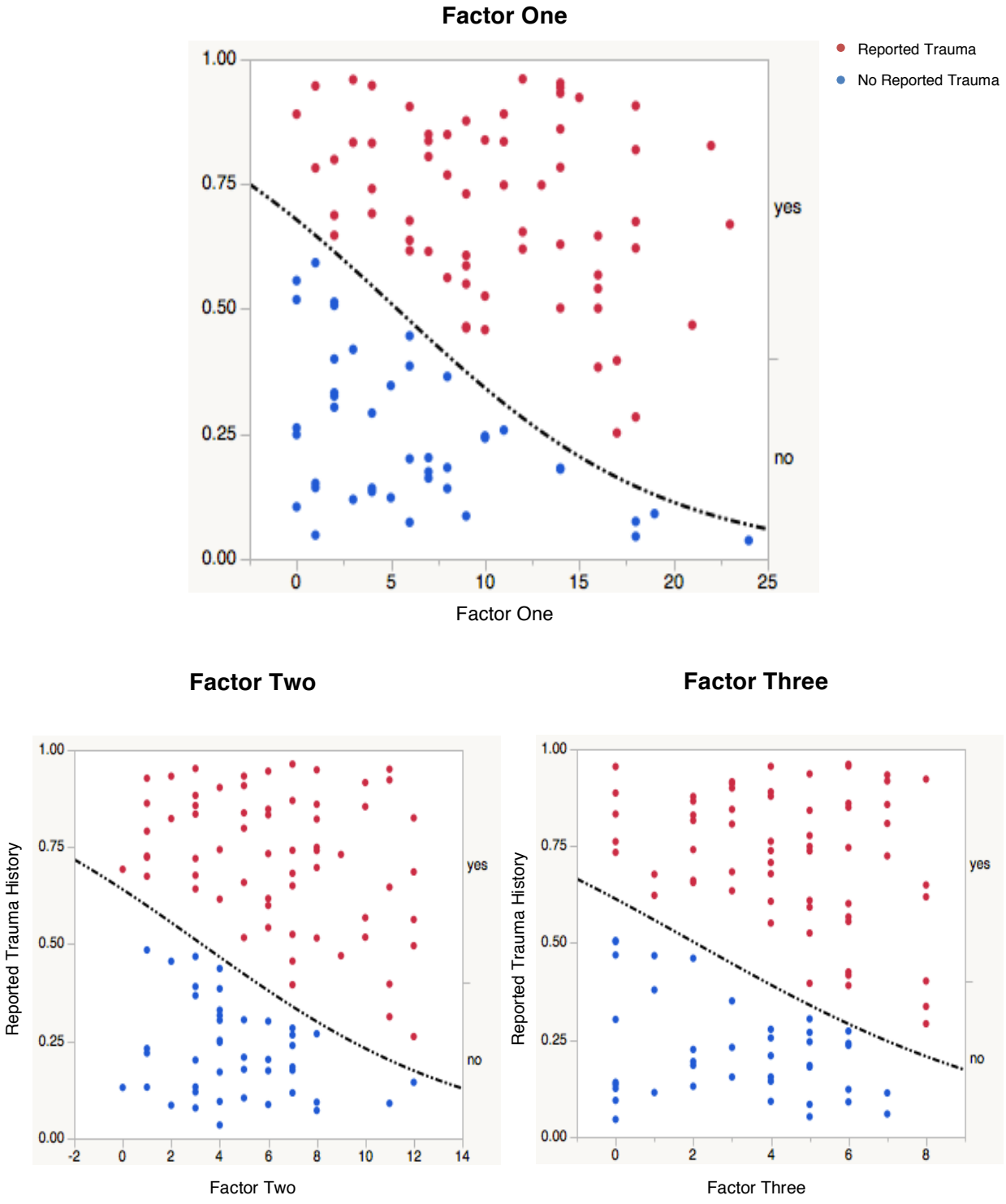


Figure 1.5.3. *Logistic Fit of Three–Factor Model Assigning Group Membership: Females*

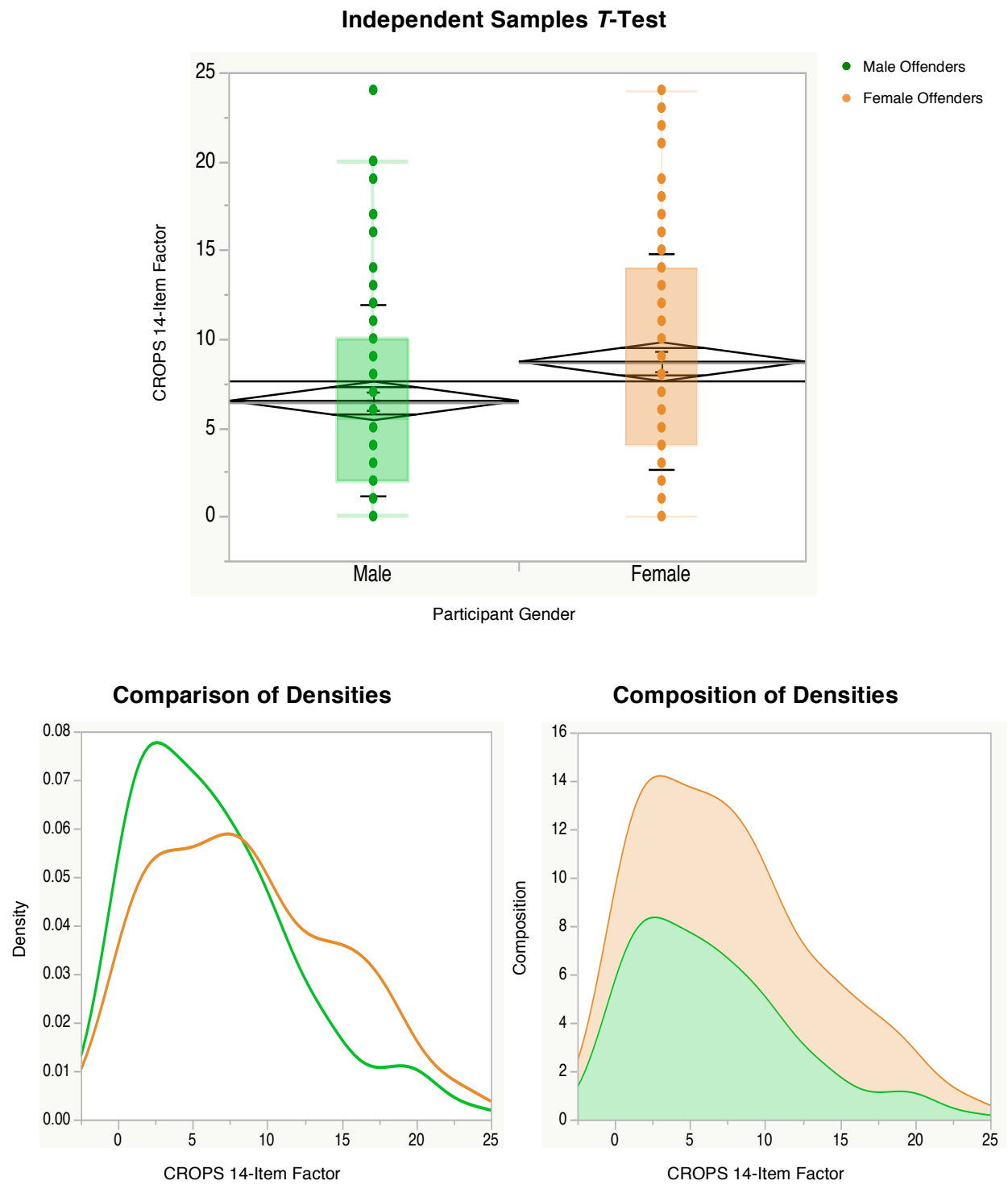


Figure 1.6. *Graphic of 14-Item Factor Mean Difference Plots Between Gender*

Table 1.8.1.

ROC Curve Coordinates of 14-Item Factor for Group Classification: Males

Positive if Greater Than or Equal To*	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
.5000	.980	.842
1.5000	.941	.737
2.5000	.843	.561
3.5000	.784	.544
4.5000	.667	.509
5.5000	.608	.404
6.5000	.510	.368
7.5000	.471	.263
8.5000	.392	.228
9.5000	.373	.175
10.5000	.255	.123
11.5000	.216	.105
12.5000	.196	.088
13.5000	.176	.070
15.0000	.118	.035
16.5000	.098	.035
18.0000	.078	.035
19.5000	.059	.018
22.0000	.020	.000
25.0000	.000	.000

**The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus*

Table 1.8.2.

ROC Curve Coordinates of 14-Item Factor for Group Classification: Females

Positive if Greater Than or Equal To*	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
.5000	.984	.884
1.5000	.953	.791
2.5000	.906	.651
3.5000	.875	.581
4.5000	.813	.512
5.5000	.813	.465
6.5000	.750	.372
7.5000	.688	.302
8.5000	.641	.233
9.5000	.516	.209
10.5000	.469	.163
11.5000	.422	.140
12.5000	.375	.140
13.5000	.359	.140
14.5000	.250	.093
15.5000	.234	.093
16.5000	.156	.093
17.5000	.125	.093
18.5000	.047	.047
20.0000	.047	.023
21.5000	.031	.023
22.5000	.016	.023
23.5000	.000	.023
25.0000	.000	.000

**The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus*

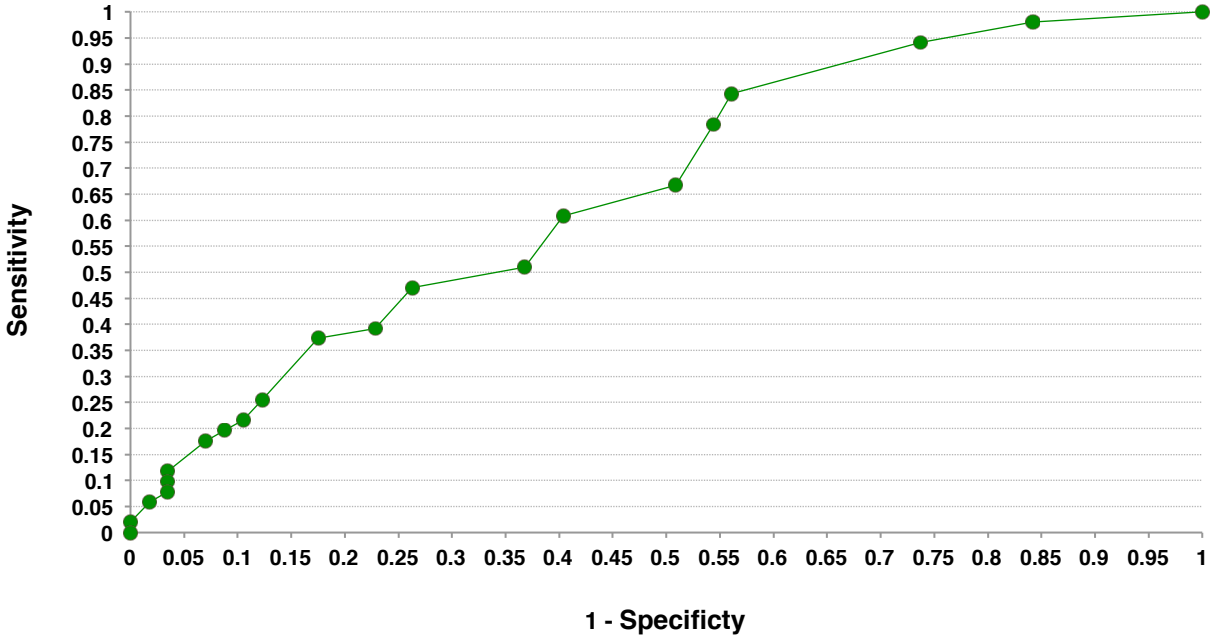


Figure 1.7.1. *ROC Curve of CROPS 14-Item Factor for Group Classification: Males*

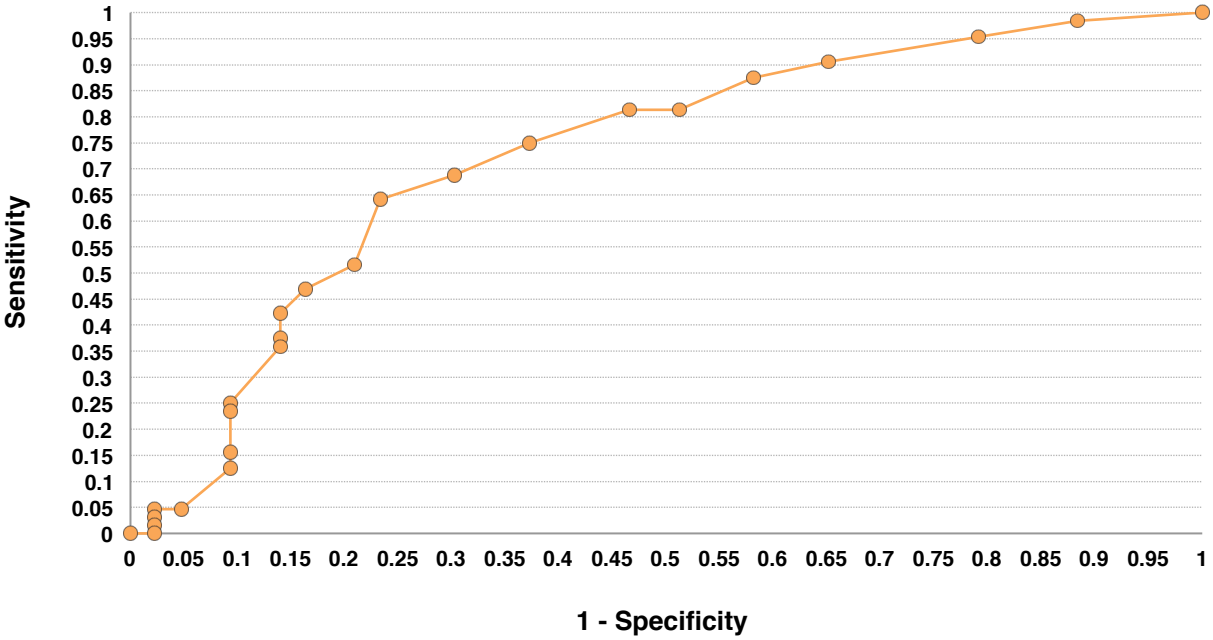


Figure 1.7.2. *ROC Curve of CROPS 14-Item Factor for Group Classification: Females*

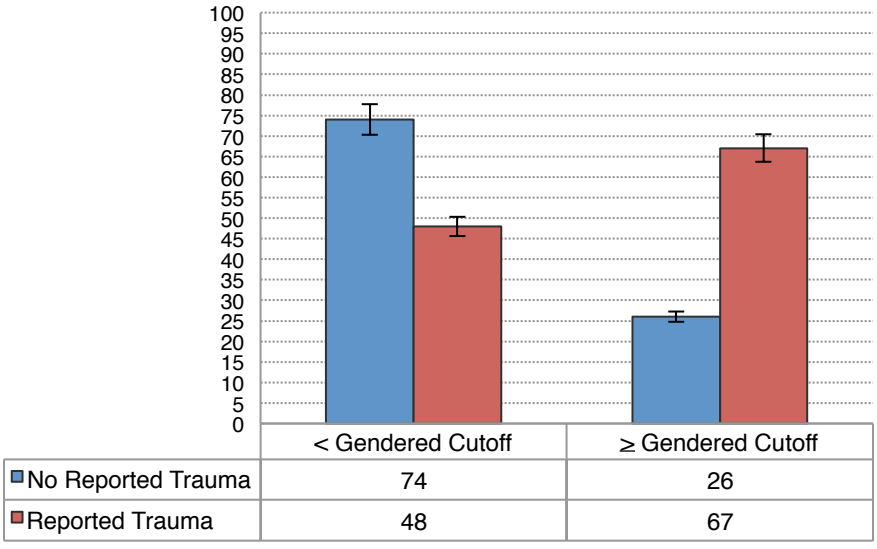
Table 1.9.

Cross Tabulation of CROPS 14-Item Factor

Trauma History	Cutoff Score[1] Non-Significant	Significant	χ^2	φ	*N*
Total Sample					
No Trauma	74 (56.7)	26 (43.3)	22.68***	.33	215
Trauma	48 (65.3)	67 (49.3)			
Females					
No Trauma	27 (17.3)	16 (25.7)	15.28***	.38	107
Trauma	16 (25.7)	48 (38.3)			
Males					
No Trauma	47 (41.7)	10 (15.3)	5.32*	.22	108
Trauma	32 (37.3)	19 (13.7)			

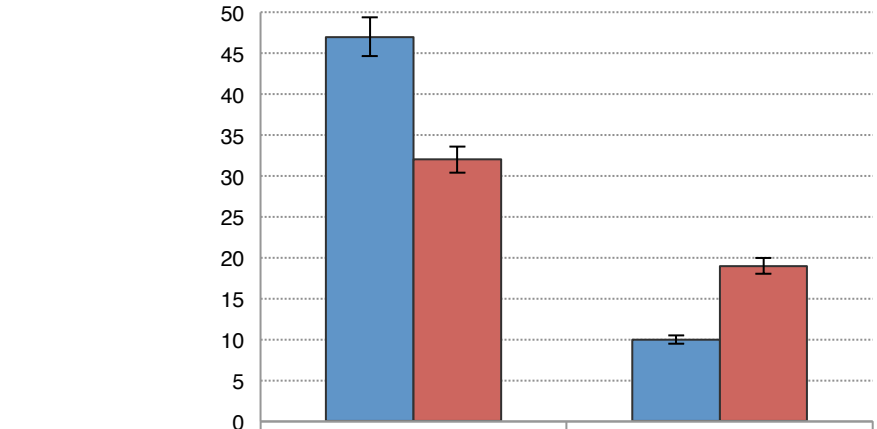
[1] *= Cutoff scores differ for male and female offenders: Cutoff for Males ≥ 9; Cutoff for Females ≥ 6*

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



** Error bars demarcate a five percent interval of case size to approximate error range*

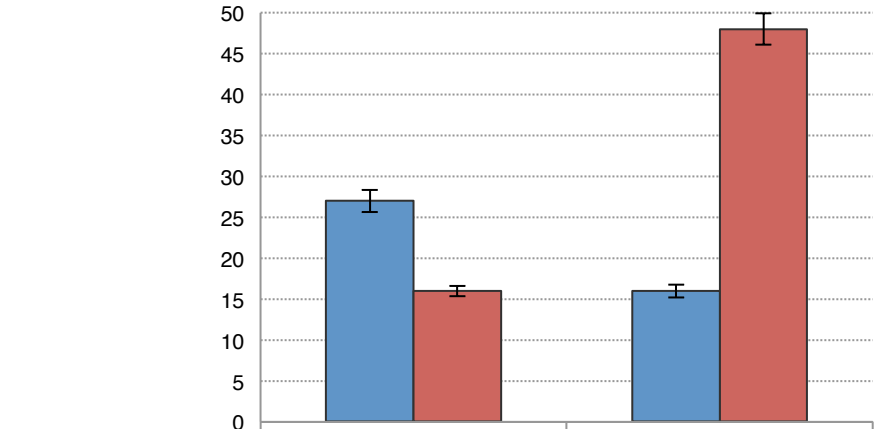
Figure 1.8.1. *Cross Tabulation of CROPS 14-Item Factor Using Gendered Cutoff Score*



	Score < 10	Score > 9
No Reported Trauma	47	10
Reported Trauma	32	19

** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 1.8.2. *Cross Tabulation of CROPS 14-Item Factor Cutoff Score for Males*



	Score < 7	Score > 6
No Reported Trauma	27	16
Reported Trauma	16	48

** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 1.8.3. *Cross Tabulation of CROPS 14-Item Factor Cutoff Score for Females*

CHAPTER IV

DETECTION OF PREVIOUS TRAUMA EXPOSURE AMONG JUVENILE OFFENDERS USING THE BASC-2—SELF-REPORT OF PERSONALITY*

*Edner, B. J., Glaser, B. A., & Calhoun, G. (2018). Detection of previous trauma exposure among juvenile offenders using the BASC-2–Self-Report of Personality. To be submitted to the *Journal of Child and Adolescent Trauma*.

Abstract

Objective: The *Behavior Assessment System for Children, Second Edition—Self-Report of Personality (BASC-2-SRP)* is an effective assessment tool for adjudicated youth and has demonstrated moderate efficacy for detecting trauma in juvenile offenders. However, more research is needed to determine what scales and/or item clusters within the BASC-2-SRP provide maximum utility for detecting trauma among this population. ***Method:*** Retrospective data of 315 adjudicated youth (41% female and 59% males) were used to examine the predictive accuracy of the BASC-2-SRP in detecting trauma. Mean comparisons of clinical subscales by trauma group were conducted. Clinical subscales yielding statistical mean differences were included in a predictive discriminant analysis (PDA) to classify trauma. ***Results:*** Mean comparisons revealed statistical differences across all clinical subscales. PDA output indicated modest predictive utility for clinical subscales, largely dependent on gender. For males, results indicated limited clinical utility not conducive for further analysis (51.4% sensitivity and 70.5% specificity). In contrast, results indicated moderate clinical utility for females (69.4% sensitivity and 67.2 specificity). A series of stepwise PDAs were conducted to identify subscale items underlying the classification accuracy for female offenders. PDA analyses yielded an 11-item trauma composite. A logistic regression analysis indicated moderate predictive accuracy for the trauma composite in identifying trauma in female offenders (72.1%). An ROC curve analysis indicated a cutoff score of greater than or equal to nine, which demonstrated moderate to strong diagnostic utility (73% sensitivity and 71.2% specificity). ***Conclusion:*** Overall findings provide moderate support for the utility of the BASC-2-SRP trauma composite in accurately identifying trauma among female juvenile offenders.

Keywords: Trauma, Assessment, Juvenile offender, BASC-2, Scale development, Psychometrics, Discriminant analysis

Introduction

Research indicates that several scales on the *Behavior Assessment System for Children, Second Edition, Self-Report of Personality—Adolescent* (BASC-2-SRP; Reynolds & Kamphaus, 2004) relate to trauma among delinquent youth (Perkins, Calhoun, & Glaser, 2014; Perkins et al., 2016; Zito, 2016; Edner, Kunemund, Glaser, & Calhoun, 2017; Kunemund et al., 2016). However, BASC-2 authors have not identified latent factors concerning to trauma-related symptomology. Reynolds and Kamphaus (2004) suggest that youth who have experienced trauma are likely to have elevated scores on the Locus of Control subscale. Yet, no normative data for trauma-exposed youth have been reported in the literature for the BASC-2. While the BASC-2 is a commonly used instrument for measuring baseline socioemotional and adaptive behaviors after various trauma exposures as well as response to intervention (*see* McGill et al., 2014; Berkowitz, Stover, & Marans, 2011; Ford, 2011; Valentino, Berkowitz, & Stover, 2010; Briere & Spinazzola, 2009), there is limited research examining the BASC-2 as a trauma measure in itself.

Among adjudicated youth, BASC-2-SRP clinical subscales have been shown to predict trauma exposure and posttraumatic stress symptoms (Perkins, Calhoun, & Glaser, 2014). Perkins, Calhoun, and Glaser (2014) found a distinct BASC-2-SRP profile for juvenile offenders exceeding the cutoff for clinical significance on the *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999). Specifically, elevations on the Anxiety, Social Stress, and Somatization subscales distinguished adjudicated youth with a significant score on the CROPS compared to those without. These results offer a cluster of BASC-2 subscale elevations that might be useful for identifying posttraumatic symptoms among juvenile offenders (Perkins, Calhoun, & Glaser, 2014).

When comparing BASC-2 scores of delinquents with and without reported trauma history, Edner, Kunemund, Glaser, and Calhoun (2017) found that youth with trauma history had statistically higher scores across all BASC-2 scales, respectively. In examining the BASC-2-SRP and the *Trauma Symptom Checklist for Children* (TSCC; Briere, 1996) among adjudicated youth, Zito (2016) found several subscale relations. The BASC-2-SRP Atypicality, Social Stress, Anxiety, and Somatization clinical subscales explained 64.7 percent of the variance of the TSCC Anxiety scale. Similarly, BASC-2-SRP scores on the Atypicality, Social Stress, and Attention Problems subscales predicated the TSCC Depression scale. These scales explained 65.1 percent of the variance.

With respect to the TSCC Anger scale, scores on the BASC-2-SRP Sensation Seeking, Social Stress, and Hyperactivity subscales explained 53.1 percent of the variance, while scores on the Atypicality, Social Stress, Sense of Inadequacy, and Hyperactivity subscales explained 60.3 percent of variance on the TSCC Posttraumatic Stress scale. Scores on the BASC-2-SRP Social Stress, Attention Problems, and Hyperactivity subscales predicted scores on the TSCC Dissociation scale; BASC-2-SRP scores explained 53.5 percent of the variance. Finally, the TSCC Sexual Concerns scale was predicated by BASC-2-SRP scores on the Atypicality and Locus of Control subscales, accounting for 48.6 percent of the variance. Taken together, results reveal that scores on the BASC-2-SRP clinical subscales explain moderate to substantial portions of variance on TSCC scales (Zito, 2016). These statistical relations further support the potential of the BASC-2-SRP for measuring trauma-related symptoms in juvenile offenders.

Indeed, Perkins et al. (2016) recommends that researchers “construct a trauma subscale based on critical items found in the BASC-2-SRP Social Stress, Somatization, and other scales” (p. 679). Such a trauma scale specific for adjudicated youth could better alert clinicians to the presence of trauma reactions among offenders (Perkins, et al., 2016). Establishing an

empirically valid delinquent-specific trauma scale within the BASC-2-SRP would be an important contribution to the literature as many forensic agencies and other mental health providers do not evaluate for trauma symptoms without previous notification of trauma history (Ford et al., 2007). Thus, research is warranted for investigating trauma-related items within the BASC-2-SRP to establish such a scale.

Method

Participants

The sample of juvenile offenders examined in this study consisted of retroactive data of adolescents in a mid-sized southeastern city. Study participants were referred by the Department of Juvenile Justice (DJJ) to receive clinical services and placement recommendations. Legal guardians of all participants provided informed consent for participant data to be used for research purposes. Youth offense types within the sample predominately consisted of crimes against person and/or property, narcotics, and/or status offenses. Graduate students in training completed all clinical intake interviews, clinical case notes, and psychological evaluations. The Internal Review Board (IRB) of the University of Georgia approved all procedures for this study.

Participants in this study (N = 315) consisted of 186 males (59%) and 129 females (41%). The self-identified racial breakdown consisted predominantly of African-American participants (N = 219; 69.5%). Remaining sample demographics consisted of 56 White participants (17.8%), 28 Latinx participants (8.9%), 10 participants who identified as Multiracial (3.2%), one participant who identified as Asian American (0.3%), and one participant who identified as Native American (0.3%). Age of youth ranged from 12 to 17 years with a mean age of 14.91 (SD = 1.19). Refer to Tables 2.1.1 and 2.1.2 and Figures 2.1.1 and 2.1.2 for demographic characteristics for total sample and by gender.

Materials

The BASC-2-SRP comprises clinical and adaptive scales that compare a child's behavioral functioning and adjustment with age-matched peers (Reynolds & Kamphaus, 2004). The BASC-2-SRP consists of 139 items and evaluates children's functioning within the areas of School Problems, Internalizing Problems, Inattention/Hyperactivity, Emotional Symptoms, and Personal Adjustment. Norms for the BASC-2-SRP are based on a U.S. sample of youth representative of the general population. The clinical scales assess psychological and behavioral maladjustment; high scores on these scales represent behaviors that impair functioning in home, school, peer relationships, and/or community contexts (Reynolds & Kamphaus, 2004).

The BASC-2-SRP has demonstrated sound psychometric properties, including solid internal consistency, as well as discriminant and convergent validity (Reynolds & Kamphaus, 2004). Internal consistency coefficient estimates range from .61 to .90. With respect to BASC-2 composite scales, Cronbach's alpha coefficients range from .83 to .95 falling in the moderate to excellent range. Test-retest reliability correlations range from $r = .61$ to $r = .84$ for individual scales and from $r = .74$ to $r = .84$ for composites (Reynolds & Kamphaus, 2004). Please refer to Tables 2.2.1 – 2.2.3 for subscale and composite scale descriptions and Tables 2.3.1 – 2.3.2 and Figure 2.2 for descriptive statistics for total sample and by gender.

Demographic information and legal history of participants was gathered through clinical interviews, DJJ referral information, and Juvenile Tracking System (JTS) data. Participants were included in the current study if they met the following criteria: 1) the BASC-2 was completed in a valid manner* during clinical intake/interview and 2) if information regarding the absence or

*Data were excluded if scores on any BASC-2 validity scale indicated 'extreme caution.' Data were also excluded if two or more validity scales signaled 'caution,' with the exception of the F scale – this is due to data suggesting adjudicated youth endorse infrequency items more than the normative sample (Reynolds & Kamphaus, 2004).

presence of past trauma exposure(s) was provided during the course of the clinical intake/interview, psychological testing, and/or provision of counseling or clinical services.

Procedure

This study defined trauma as being exposed to and/or experiencing violent or stressful event(s) early in life that exceed one's dependable coping and/or defensive operations (Terr, 1991; Maschi, 2006). At least one reported traumatic event must have occurred prior to initial adjudicated offense(s). Exposure(s) to environmental, interpersonal, and intrapersonal events/situations falling within this definition of trauma were informed by current literature (American Psychiatric Association, 2013) and used in previous research (*see* Edner, Glaser, & Calhoun, 2017). Specifically, abuse types within this study included physical and/or sexual abuse (Chaplo et al., 2015; Cuadra et al., 2014); neglect (Logan-Greene & Jones, 2015); loss/separation from a loved one (Harnisher et al., 2015); witnessing domestic or community violence (Baglivio & Epps, 2016; Ford et al., 2008); experiencing multiple of the abovementioned trauma types; or a single traumatic event as reported by JTS data.

Data indicated that 128 (40.6%) participants were reported to have experienced at least one previous trauma; 187 (59.4%) participants were reported to have no trauma history. The majority of participants with trauma history endorsed experiencing multiple types of traumas (38; 29.7%). Remaining participants with trauma history reported only one type of trauma. Specifically, 14 participants reported history of physical abuse (10.9%), 19 participants reported history of sexual abuse/assault (14.8%), four participants reported history of physical and/or emotional neglect (3.1%), 21 participants reported having abruptly experienced the loss of a loved one (16.4%), 26 participants reported witnessing domestic and/or community violence (20.3%), and three participants experienced single event traumas as reported by JTS data (2.3%).

Data Analysis

This study utilized Statistical Package for the Social Sciences (SPSS), JMP Statistical Software, and Microsoft Excel for data storage, statistical analyses, and data visualization. Prior to analysis, data were screened for univariate outliers. Z-score values that exceeded 3.2 standard deviations above group means were excluded from analyses. Osborne (2001) demonstrated that removal of univariate outliers reduce the probability of both Type I and Type II errors, as well as improve accuracy of estimates. After removal of univariate outliers, data were screened for multivariate outliers using Mahalanobis distances; no outliers were detected ($p > .001$ for all observations).

Mean Comparisons for BASC-2 Clinical Subscales

Mean differences for the BASC-2-SPR clinical subscales were examined using independent samples *T*-tests. Adjudicated youth with a reported trauma history were compared to adjudicated youth with no reported trauma history. Independent samples *T*-tests were interpreted with 95 percent confidence and conducted with the total sample and by gender.

Results

For the total sample, results indicated statistical differences for all BASC-2-SRP clinical subscales at the alpha = .05 level. A statistical breakdown of mean comparisons of clinical subscales are as follows: Atypicality, $t(313) = -3.96$, $p < .001$ ($d = 0.47$); Locus of Control, $t(313) = -3.73$, $p < .001$ ($d = 0.42$); Social Stress, $t(313) = -4.14$, $p < .001$ ($d = 0.47$); Depression, $t(313) = -4.75$, $p < .001$ ($d = 0.54$); Anxiety, $t(313) = -6.68$, $p < .001$ ($d = 0.78$); Sense of Inadequacy, $t(313) = -4.77$, $p < .001$ ($d = 0.47$); Somatization, $t(313) = -3.75$, $p < .001$ ($d = 0.44$); Attention Problems, $t(313) = -4.75$, $p < .001$ ($d = 0.50$); and Hyperactivity, $t(313) = -4.75$, $p < .001$ ($d = 0.59$). Results revealed medium effect sizes for the all subscales with the exception of the Anxiety subscale, which indicated a medium to large effect size. As a result, all aforementioned

scales were included in the predicative discriminant model. Refer to Table 2.4.1 for *T*-test results, Figure 2.3.1a and Figure 2.3.1b for BASC-2-SPA clinical subscale profiles and effect sizes by group.

When split by gender, similar results were detected. For male offenders, results indicated statistical differences for all BASC-2-SRP clinical subscales with the exception of Somatization ($p > .05$). A statistical breakdown of mean comparisons of clinical subscales are as follows: Atypicality, $t(187) = -3.13$, $p = .002$ ($d = 0.47$); Locus of Control, $t(187) = -2.28$, $p = .025$ ($d = 0.37$); Social Stress, $t(187) = -3.13$, $p = .002$ ($d = 0.48$); Anxiety, $t(187) = -4.37$, $p < .001$ ($d = 0.66$); Depression, $t(187) = -3.07$, $p = .002$ ($d = 0.47$); Sense of Inadequacy, $t(187) = -2.74$, $p = .007$ ($d = 0.41$); Attention Problems, $t(187) = -3.27$, $p = .005$ ($d = 0.51$); and Hyperactivity, $t(187) = -3.46$, $p = .001$ ($d = 0.52$). Results revealed medium effect sizes for all subscales. Refer to Table 2.4.2 for *T*-test results and Figures 2.3.2a – 2.3.2b for BASC-2-SRP clinical subscale profiles and effect sizes by group.

For female offenders, results indicated statistical differences for all clinical subscales. A statistical breakdown of mean comparisons for clinical subscales are as follows: Atypicality, $t(127) = -2.66$, $p = .001$ ($d = 0.47$); Locus of Control, $t(127) = -2.28$, $p = .024$ ($d = 0.40$); Social Stress, $t(127) = -2.87$, $p = .005$ ($d = 0.50$); Anxiety, $t(127) = -4.59$, $p < .001$ ($d = 0.81$); Depression, $t(127) = -3.08$, $p = .003$ ($d = 0.55$); Sense of Inadequacy, $t(127) = -3.57$, $p = .001$ ($d = 0.63$); Somatization, $t(127) = -6.48$, $p < .001$ ($d = 0.65$); Attention Problems, $t(127) = -2.68$, $p = .008$ ($d = 0.47$); and Hyperactivity, $t(127) = -4.21$, $p < .001$ ($d = 0.74$). Results revealed medium to large effect sizes for Anxiety and Hyperactivity subscales and medium effect sizes for remaining subscales. Refer to Table 2.4.3 for *T*-test results and Figures 2.3.3a – 2.3.3b for BASC-2-SPR clinical subscale profiles and effect sizes by group.

Predictive Discriminant Analysis Using BASC-2 Clinical Subscales

In order to select a subset of BASC-2-SRP clinical subscales among a larger constellation of BASC-2-SRP subscales, authors employed a predictive discriminant analysis (PDA) (Thompson, 1995) for the total sample and by gender. PDAs were conducted with BASC-2-SRP clinical subscales using a leave-one-out cross validation (LOOCV). To minimize skewness and stabilize the variances, data were subjected to a square root transformation. After square root transformations, Box's M test indicated relative equality of covariance matrices ($p > .001$), demonstrating limited distortion of alpha levels (Tabachnick & Fidell, 2007).

Results

Results revealed a discriminant function that statistically classified juvenile offenders with a reported history of trauma, $\lambda = .842$, $\chi^2(9, 315) = 52.99$, $p < .001$, with a medium effect size (canonical $r^2 = .40$). When subjected to cross-validation, the discriminant function derived from BASC-2-SRP clinical subscales correctly classified 47.7 percent of youth with reported trauma history and 79.7 percent of youth without trauma history. Overall, the discriminant function correctly classified 66.7 percent of the original grouped cases.

Diagnostic efficacy statistics for the total sample indicated a sensitivity of 61.6 percent and specificity of 69 percent. When examining the total sample, the discriminant function successfully identified adjudicated youth with no reported trauma history, but provided limited accuracy for detecting youth with reported trauma history. Together, results reveal that the BASC-2-SRP discriminant function has negligible clinical utility for identifying adjudicated youth with reported trauma history. Refer to Tables 2.5.1a – 2.5.1d for PDA diagnostics and Figures 2.4.1a and 2.4.1b for graphic PDA depictions.

When split by gender, results revealed stark differences between the predictive utility of the BASC-2-SRP discriminant function among male and female offenders. For male offenders,

results revealed a discriminant function that statistically classified those with a reported history of trauma, $\lambda = .876$, $\chi^2(9, 186) = 23.77$, $p = .005$; a small to medium effect size was indicated (canonical $r^2 = .35$). When subjected to cross-validation, the discriminant function derived from BASC-2-SRP clinical subscales correctly classified only 30.2 percent of male offenders with reported trauma history, but correctly classified 85.4 percent of males without trauma history. Overall, the discriminant function correctly classified 66.7 percent of the original grouped cases.

With respect to diagnostic efficacy statistics for male offenders, the BASC-2-SRP discriminant function yielded a sensitivity of 51.4 percent and specificity of 70.5 percent. Together, the BASC-2-SRP discriminant function for male offenders provided solid specificity for identifying adjudicated youth without reported trauma history. In contrast, the discriminant function provided negligible accuracy for detecting reported trauma history in male offenders. Results reveal the BASC-2-SRP discriminant function to demonstrate very limited clinical utility for accurately classifying male juvenile offenders with reported trauma history. Findings indicate that while the BASC-2-SRP provides valuable data on the psychological functioning of adjudicated males, the instrument does not provide the statistical efficacy to warrant its use for detecting trauma symptomology among this population. No further analyses of the BASC-2-SRP clinical subscales for trauma symptom detection are employed for male juvenile offenders. Refer to Tables 2.5.2a – 2.5.2d for PDA diagnostics and Figures 2.4.2a – 2.4.2b for graphic PDA depictions.

For female offenders, results revealed a discriminant function that statistically classified those with a reported history of trauma, $\lambda = .786$, $\chi^2(9, 129) = 29.52$, $p = .001$; a medium effect size was indicated (canonical $r^2 = .46$). When subjected to cross-validation, the discriminant function derived from BASC-2-SRP clinical subscales correctly classified 66.2 percent of female juvenile offenders with reported trauma history. The discriminant function correctly classified

70.3 percent of females without a reported trauma history. Overall, the discriminant function correctly classified 68.2 percent of the original grouped cases.

With respect to diagnostic efficacy statistics for female juvenile offenders, the BASC-2-SRP discriminant function yielded a sensitivity of 69.4 percent and specificity of 67.2 percent. Unlike for male juvenile offenders, results reveal the BASC-2-SRP discriminant function to have moderate to high clinical utility for classifying female juvenile offenders with and without reported trauma histories. Findings show that the BASC-2-SRP clinical subscales demonstrate statistical efficacy to warrant the use of this instrument for detecting trauma symptomology among this population. While findings indicate that all nine BASC-2-SRP clinical subscales provide statistical efficacy for successfully discriminating female offenders with and without a reported trauma history, results do not provide information about the specific items or item clusters embedded within these subscales that optimize classification accuracy. Refer to Tables 2.5.3a – 2.5.3d for PDA diagnostics and Figures 2.4.3a – 2.4.3b for graphic PDA depictions.

Wilks λ Stepwise PDA for BASC-2 Clinical Subscale Items

In order to select a subset of BASC-2-SRP clinical subscale items among a larger constellation of items, authors conducted a series of stepwise PDAs for BASC-2 clinical subscales (Thompson, 1995) – all stepwise PDAs employed LOOCV. The stepwise PDAs employed a backward elimination procedure and utilized the Wilks' λ stepwise method for predictor identification; an *F* value criterion was used to determine removal of predictors ($F = 2.71$). In order to minimize skewness and stabilize the variances, data were subjected to square root transformation. After square root transformations, Box's M test indicated relative equality of covariance matrices ($p > .001$), demonstrating limited distortion of alpha levels (Tabachnick & Fidell, 2007).

For item pool analyses, authors only included BASC-2-SRP-A subscale items that were retained in the recent updated version of the BASC-3-SRP-A (Reynolds & Kamphaus, 2015). BASC-2-SRP-A items eliminated from the BASC-3-SRP-A were not included in the analyses. Refer to Table 2.6 for internal consistencies of the included BASC-2-SRP-A subscale items and Appendix B for a breakdown of all included and omitted BASC-2-SRP-A subscale items.

Results

For the Atypicality subscale, one item was retained in the analysis: “I see weird things” ($F(1, 127) = 5.67$, $p = .017$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma history, $\lambda = .956$, $\chi^2(1, 127) = 5.83$, $p = .017$, with a small effect size (canonical $r^2 = .21$). One item was retained in the Locus of Control subscale: “I get blamed for things I can't help” ($F(1, 127) = 5.52$, $p = .020$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .958$, $\chi^2(1, 127) = 5.38$, $p = .020$; a small effect size was indicated (canonical $r^2 = .20$). For the Social Stress* subscale, two items were retained. Items included: “People say bad things to me” ($F(1, 127) = 12.47$, $p = .001$) and “Other people find things wrong with me” ($F(2, 126) = 9.65$, $p < .001$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .867$, $\chi^2(2, 127) = 17.95$, $p < .001$, with a small to medium effect size (canonical $r^2 = .36$).

For the Anxiety subscale, two items were retained in the analysis: “I worry a lot of the time” ($F(1, 127) = 15.87$, $p < .001$) and “I worry but I don’t know why” ($F(2, 126) = 10.90$, $p < .001$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .853$, $\chi^2(2, 127) = 20.10$, $p < .001$; a medium effect size was indicated (canonical $r^2 = .38$). Two items were retained in the Depression subscale: “I feel like my life is

*Scales with asterisk marks indicate that items have not been omitted.

getting worse and worse" ($F(1, 127) = 8.10$, $p = .005$) and "I feel sad" ($F(2, 126) = 6.07$, $p = .003$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .912$, $\chi^2(2, 127) = 11.59$, $p = .003$; a small to medium effect size was indicated (canonical $r^2 = .30$). For the Sense of Inadequacy subscale, one item was retained: "I want to do better, but I can't" ($F(1, 127) = 7.84$, $p = .006$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .942$, $\chi^2(1, 127) = 7.58$, $p = .006$; a small to medium effect size was indicated (canonical $r^2 = .24$).

For the Somatization subscale, one item was retained: "I feel dizzy" ($F(1, 127) = 10.45$, $p = .002$). Results revealed a discriminant function that statistically classified adjudicated females with reported trauma, $\lambda = .924$, $\chi^2(1, 127) = 10.00$, $p = .002$, with a small effect size (canonical $r^2 = .28$). One Attention Problems subscale item was retained: "I have trouble paying attention to what I am doing" ($F(1, 127) = 5.11$, $p = .025$). The item statistically classified adjudicated females with reported trauma, $\lambda = .961$, $\chi^2(1, 127) = 4.99$, $p = .025$; a small effect size was indicated (canonical $r^2 = .20$). Finally, two Hyperactivity* subscale items were retained. Items included: "People tell me to be still" ($F(1, 127) = 20.86$, $p < .001$) and "People tell me that I am too noisy" ($F(2, 126) = 14.51$, $p < .001$). These subscale items statistically classified adjudicated females with reported trauma, $\lambda = .813$, $\chi^2(2, 127) = 26.12$, $p < .001$, with a medium effect size (canonical $r^2 = .43$). Refer to Tables 2.7.1a – 2.8.2 and Figures 2.5.1 – 2.5.9 for PDA diagnostics.

PDA Using Identified BASC-2 Clinical Subscale Items

To evaluate the utility of the 13 retained BASC-2-SRP items for detecting trauma history, authors employed a PDA (Thompson, 1995) using a LOOCV. Box's M test indicated relative equality of covariance matrices ($p > .001$), demonstrating limited distortion of alpha levels

*Scales with asterisk marks indicate that items have not been omitted.

(Tabachnick & Fidell, 2007). An initial PDA revealed two items that did not statistically contribute to the model (< .30): “I get blamed for things I can't help” and “I see weird things.” Both items were subsequently removed from the model.

Results

Results of the 11 items included in the model revealed a discriminant function that statistically classified those with a reported history of trauma, $\lambda = .653$, $\chi^2(11, 129) = 51.76$, $p < .001$; a medium effect size was indicated (canonical $r^2 = .59$). When subjected to cross-validation the discriminant function derived from 11 items correctly classified 68.8 percent of female juvenile offenders with a reported trauma history. The discriminant function correctly identified 73.8 percent of females without a reported trauma history. Taken together, the discriminant function correctly classified 71.3 percent of participants to their originally grouped cases. Please refer to Tables 2.9.1 – 2.9.4 for PDA diagnostics and Figures 2.6.1 and 2.6.2 for graphic PDA depictions.*

Diagnostic efficacy statistics of the discriminant function yielded a sensitivity of 70.6 percent and specificity of 72.1 percent. The 11-item BASC-2-SRP discriminant function for female offenders provided solid predictive and clinical utility for both specifying and accurately identifying adjudicated females with and without a reported trauma history.

Mean Comparison and Reliability of BASC-2 Trauma Composite by Group

In order to analyze the group discrimination items as a distinct scale, items were added together for a cumulative score. A mean comparison for the 11-Item BASC-2 was examined using an independent sample *T*-tests between adjudicated females with and without a reported trauma history. The independent samples *T*-test was interpreted with 95 percent confidence. As

*Scatterplots of Matrices by group can be found in Appendix D

expected, results indicated statistical differences between groups with a very large magnitude, $t(127) = -6.58$, $p < .001$ ($d = 1.16$). Refer to Figure 2.7 for graphic depiction of mean difference and density plots.

The 11-item measure demonstrated solid internal consistency with respect to intraclass correlation (Cronbach's alpha = .76), measure length (Spearman-Brown = .78), and split-half reliability (Guttman Split-Half = .77). Together, findings reveal the 11 BASC-2-SRP items to demonstrate statistical efficacy and warrant use for the11-item measure for detecting trauma symptomology in female juvenile offenders. Refer to Table 2.10.1 – 2.10.2 for the descriptive statistics and internal consistencies of the BASC-2 trauma composite for total sample and by group and gender.

Logistic Regression for BASC-2 Trauma Composite

Authors conducted a logistic regression analysis to identify the predictive accuracy and estimate the odds of trauma having been reported based upon change in the 11-item trauma scale; logistic analysis was interpreted with 95 percent confidence. To identify outliers, analogs of Cook's influence statistics were computed; all Cook's distances fell below 0.50. To evaluate goodness of fit, Hosmer and Lemeshow tests were performed; results indicated no conflict with model assumptions of fit ($p > .05$).

Results

When examining the trauma composite, a logistic regression analysis revealed that the 11-item scale statistically predicted a reported trauma history with 72.1 percent accuracy, Wald χ^2 (1, 129) = 26.03, $p < .001$. The odds ratio for the 11-item measure was 1.287, indicating that female juvenile offenders were 1.287 times more likely to have a reported trauma history for every one point increase on their score on the 11-item measure. Results revealed a medium effect size (Nagelkerke $R^2 = .33$). This indicates that approximately 33 percent of the variance of

reporting a trauma history among the sample is explained by item endorsement on the 11-item measure, respectively. Refer to Table 2.11 for summary of logistic analysis and Figure 2.8 for graphic depiction of nominal logistic fit.

ROC Curve of BASC-2 Trauma Composite Items

Authors computed a receiver operating characteristic (ROC) curve to distinguish a cutoff value to maximize accurate classification of group membership (Mossman, 1994). Sensitivity and specificity were calculated at all possible cutoff points (Becker et al., 2004). In addition, an area under the curve (AUC) analysis was employed to determine association between BASC-2-SRP scores and group membership.

Results

ROC analysis indicated that the BASC-2 differentiated female offenders by reported trauma history with moderate accuracy (Akobeng, 2007), AUC = .787, $p < .001$. Inflection values with the highest sensitivity and specificities of group assignment fell at coordinates 8.5 and 9.5, respectively. Authors used a cutoff score of nine to discriminate female offenders by reported trauma history. Refer to Table 2.12 for ROC curve coordinates and Figure 2.9 for graphic depiction of ROC curve.

Cross Tabulation of Trauma Composite Cutoff

To examine the predictive utility of the nine-point cutoff for the BASC-2-SRP trauma composite, chi-square tests of independence were performed with 95 percent confidence.

Results

Results revealed the BASC-2-SRP trauma composite cutoff score statistically classified adjudicated females with and without a reported history of trauma, χ^2 (1, 129) = 25.22, $p < .001$; a large effect size was indicated ($\varphi = .44$). Results indicated that the BASC-2-SRP cutoff

correctly classified the presence or absence of reported trauma history among female offenders with a large magnitude of relation. Refer to Table 2.13 for results of the chi-square test of independence for the BASC-2-SRP 11-item cutoff score.

Regarding diagnostic efficacy statistics, the BASC-2-SPR trauma composite cutoff yielded 17 false positives and 19 false negatives with a sensitivity of 73 percent and specificity of 71.2 percent. Authors computed likelihood ratios in order to calculate the odds of the BASC-2-SPR trauma composite cutoff accurately classifying female offenders. Results revealed a positive likelihood ratio (LR^+) of 2.54. This indicates that female offenders who endorse more than nine points (out of a possible 31 points) are 2.54 times more likely to have experienced a previous trauma. In contrast, results revealed a negative likelihood ratio (LR^-) of 2.64. This indicates that female offenders that endorse fewer than 9 points are 2.64 times more likely to have *not* experienced a previous trauma.

Authors also calculated predictive values to further estimate the probability of the presence or absence of trauma history. Results indicated a positive predictive value of 70.8 percent and a negative predictive value of 73.4 percent. These results reveal that the probability of a female offender having experienced previous trauma when the test is positive is 70.8 percent, while the probability of no trauma having occurred is 73.4 percent when the test is negative. Refer to Figure 2.10 for a graphic depiction of BASC-2-SPR trauma scale cutoff score accuracies among female offenders.

Discussion

For the first aim of the study, researchers explored mean differences on BASC-2 clinical scales between adjudicated youth with and without reported histories of trauma. Results revealed statistical mean differences between groups on all clinical subscales for both the total sample and among adjudicated females. Between-group statistical mean differences for

adjudicated males were indicated on all clinical scales with the exception of the Somatization subscale. The overall magnitude of mean differences between adjudicated youth with and without a reported trauma history ranged from medium to large, respectively.

Findings indicate that adjudicated youth with a reported trauma history endorse more internalizing problems and inattention/hyperactivity symptoms than adjudicated youth without a reported trauma history. Elevated difficulties within these socioemotional and behavioral areas are consistent with prior research regarding the relational mechanisms between trauma and juvenile delinquency (Kerig, 2014; Ford et al., 2006) as well as previous findings concerning the use of the BASC-2 with this population (Edner et al., 2017; Perkins et al., 2016; Perkins, Calhoun, & Glaser, 2014). However, while medium to large clinical subscale differences between adjudicated youth with and without trauma suggest differing response patterns, such differences do not necessarily serve as a function of trauma symptom detection or trauma history classification.

For the second aim of the study, researchers examined the efficacy of BASC-2-SRP-A clinical subscales discriminating and accurately classifying adjudicated youth with and without a reported history of trauma. Results revealed a cross-validated discriminant function derived from BASC-2-SRP clinical subscales that correctly classified 47.7 percent of youth in the trauma group with a sensitivity of 61.6 percent. The discriminant function correctly classified 79.7 percent of youth in the non-trauma group with a specificity of 69 percent. Together, 66.7 percent of the original grouped cases were correctly classified. Results reveal that the BASC-2-SRP discriminant function has negligible clinical utility for identifying adjudicated youth with reported trauma history. However, the limited clinical utility of the discriminant function was largely dependent on gender.

Among male offenders with reported trauma history, the cross-validated discriminant function correctly classified only 30.2 percent with a sensitivity of 51.4 percent. In contrast, the discriminant function correctly classified 85.4 percent of males in the non-trauma group with a specificity of 70.5 percent; 66.7 percent of the original grouped cases were correctly classified. Together, BASC-2-SRP clinical subscales provided solid specificity for identifying adjudicated males without reported trauma history. Yet, the clinical subscales provided negligible utility for detecting reported trauma history in male offenders. While differences in the response patterns between male offenders with and without reported trauma histories were observed, the characteristics of these differences appear largely driven by those without a history of trauma. The lack of sensitivity of the clinical subscales in detecting trauma symptomology among adjudicated males is not conducive for serving as an alerting function within a clinical context. While the BASC-2-SRP provides valuable data on the psychological functioning of adjudicated males, findings indicate the instrument does not provide the statistical efficacy to warrant its use for detecting trauma symptomology among juvenile male offenders.

Among female offenders, the cross-validated discriminant function correctly classified 66.2 percent of youth in the trauma group with a sensitivity of 69.4 percent. BASC-2-SRP clinical subscales correctly classified 70.3 percent of females in the non-trauma group with a specificity of 67.2 percent. Together, 68.2 percent of the original grouped cases were correctly classified. Findings show that clinical subscales demonstrate statistical efficacy to warrant the use of the BASC-2-SRP for detecting trauma symptomology among female offenders. While findings indicate that clinical subscales provide statistical efficacy for discriminating female offenders with and without a reported trauma history, results do not provide information about the proportions of variance explained by individual items or item clusters. Isolating and interpreting

item or item clusters responsible for classification accuracy may better serve as a viable alerting function for mental health practitioners (Perkins et al., 2016; Edner et al., 2017).

For the third aim of the study, researchers examined the predictive power of BASC-2-SRP items for each clinical subscale to identify item clusters most responsible for classification accuracy and discrimination of adjudicated females with and without a reported history of trauma. Authors only included BASC-2-SRP subscale items in the analyses that were retained in the updated version of the BASC-3-SRP-A (Reynolds & Kamphaus, 2015).

Results of the series of stepwise PDAs revealed that 11 out of a total of 86 items predominately accounted for the strength of discriminating adjudicated females with and without a reported history of trauma. With respect to clinical subscales, results revealed two items from the Hyperactivity subscale: “People tell me to be still” and “People tell me that I am too noisy;” two items from the Anxiety subscale: “I worry a lot of the time” and “I worry but I don’t know why;” two items from the Social Stress subscale: “People say bad things to me” and “Other people find things wrong with me;” and two items from the Depression subscale: “I feel sad” and “I feel like my life is getting worse and worse.” From the Somatization and Attention subscales, the remaining items “I feel dizzy” and “I have trouble paying attention to what I am doing” were retained.

The 11 clinical subscale items included in the model revealed a discriminant function that statistically classified adjudicated females with and without a reported history of trauma with a medium effect size. The cross-validated discriminant function of the trauma composite correctly classified 68.8 percent of adjudicated females with trauma history and yielded a sensitivity of 70.6 percent. Similarly, the trauma composite correctly identified 73.8 percent of youth without a reported trauma history and yielded a specificity of 72.1 percent. In total, 71.3 percent of adjudicated females were correctly classified by the BASC-2-SRP trauma composite. In regard

to reliability, the trauma composite demonstrated solid internal consistency with respect to intraclass correlation (r = .76), measure length (r = .78), and split-half reliability (r = .77).

To exam the predictive utility of the BASC-2-SRP trauma composite with a more robust statistical method (Pohar, Blas, & Turk, 2004; Wright, 2000), a logistic regression analysis was conducted. Results indicated that the BASC-2-SRP trauma composite total score provided solid contribution in predicting the presence or absence of reported trauma history among adjudicated females. A logistic analysis indicated 72.1 percent accuracy in predicting trauma, demonstrating improvement over chance rates of 50.4 percent. Scores on the trauma composite explained approximately 33 percent of accurate trauma classification variance and yielded an odds ratio of 1.287. This odds ratio indicates that adjudicated females were 1.287 times more likely to have a reported trauma history for every one point increase on their score on the trauma composite.

To dichotomize the 11-item BASC-2-SRP trauma composite to provide positive/negative trauma classification, an ROC analysis was conducted. Results revealed that a cutoff score of greater than or equal to nine statistically classified adjudicated females with and without a reported history of trauma. The BASC-2-SRP trauma composite yielded a sensitivity of 73 percent and specificity of 71.2 percent. Results indicated that adjudicated females with scores greater or equal to nine were 2.54 times more likely to have experienced a previous trauma, with an estimated probability of 70.8 percent. In contrast, adjudicated females with scores less than nine were 2.64 times more likely to have *not* experienced a previous trauma, with an estimated probability to 73.4 percent. Overall, preliminary findings indicate the BASC-2-SRP trauma composite for female offenders is a reliable scale that provides solid predictive and clinical utility for both specifying and accurately identifying adjudicated females with and without a reported trauma history.

The predictive accuracies of BASC-2-SRP trauma composite are consistent with previous work examining the efficacy of trauma assessment scales with adjudicated youth. For example on the *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992), Murray, Glaser, and Calhoun (2013) found a 17-item trauma scale for juvenile offenders with a sensitivity of 77.1 percent and specificity of 70.6 percent. However, data on the classification accuracy of the 17-item scale cutoff score by gender was not reported. With respect to adjudicated female offenders specifically, the Trauma Experiences subscale on the *Massachusetts Youth Screening Instrument, Second Edition* (MAYSI-2 TE; Grisso & Barnum, 2006) identified partial or full PTSD symptomology with a sensitivity of 73 percent and specificity of 62 percent (Kerig, Moeddel, & Becker 2011). Similarly, the *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin) yielded a sensitivity of 68.8 percent and specificity of 65.1 percent for correctly classifying adjudicated females with and without reported trauma histories (Edner et al., 2017). In sum, BASC-2-SRP Trauma Composite classification accuracies of 73 percent sensitivity and 72.1 percent specificity exceed or are commensurate with other viable trauma detection rating scales. Findings empirically support the clinical utility of the BASC-2-SRP trauma composite for adjudicated females, providing modest contribution to correctly classifying presence of absence of trauma history for this population.

Several limitations within the current study should be noted. Sample participants in this study were court referred from a relatively small demographic area. The limited demographic region might limit the generalizability of the findings. Prospective research continuing this line of inquiry should incorporate more diverse samples from demographically varied regions to explore potential differences across variables such as age, ethnicity/race, offense type, and/or current detention status. In addition, a vast majority of participants in the study provided data within a

community mental healthcare setting. As a result, findings should not be generalized to juvenile offenders being held in a detention/correctional facility.

Reliance on youth self-report might serve to underestimate symptom severity on trauma incidences (Vergano, Lauriola, & Speranza, 2015). Such underestimation may potentially introduce varying degrees of error. Also, trauma-related symptomology overlaps with several psychiatric disorders such depression, anxiety, obsessive-compulsive behavior, etc. (American Psychiatric Association, 2013). As such, it is possible that the items comprising the BASC-2-SRP trauma composite tapped into supplementary psychiatric symptoms in the absence of previous trauma exposure(s).

Youth involved with the juvenile justice system might be resistant to disclose exposure to potentially stigmatizing events (Kerig, 2013; Perkins et al., 2016). Acquiring reliable self-report data can be further complicated with respect to how youth define and understand their experiences (Bennett & Kerig, 2014; Kerig & Bennett, 2013). In addition, adjudicated youth may employ coping strategies involving emotional avoidance, in the expression of juvenile delinquency (Bennett & Kerig, 2014; Ford et al., 2006). Given the potential reticence of disclosing previous trauma experiences, the reliance on only one to three sources of historical data to corroborate reported trauma histories, or lack thereof, serves as limitation. However, despite these limitations, significant results were found.

The present study contributes to the literature by providing moderate empirical support for using the BASC-2-SPR trauma composite in accurately identifying the presence of previous trauma exposure(s) for female juvenile offenders. Findings provide preliminary support for a cutoff score to aid clinicians in determining the presence or absence of a previous history of trauma among female juvenile offenders. Compared to BASC-2-SRP clinical scales, the Trauma Composite demonstrates greater statistical accuracy in identifying reported trauma histories

among adjudicated females. These results suggest that the BASC-2-SRP Trauma Composite might increase the detection accuracy of previous trauma history when evaluating adjudicated female juvenile offenders in detention centers and/or other mental health or forensic agencies. However, further research is needed to examine the validity of the BASC-2-SRP Trauma Composite in relation to other psychometrically validated instruments.

Future studies are advised to cross-validate the BASC-2-SRP cutoff scores for female juvenile offender populations. Such research might serve to increase the efficacy of the measure by examining the consistency of accurate group classification among female juvenile offender samples. It is important to note that the BASC-2-SRP is cycling out of use after the release of the BASC-3-SRP (Reynolds & Kamphaus, 2015). While the items comprising the Trauma Composite were all retained in the BASC-3-SRP, it is necessary to investigate the consistency of the Trauma Composite between the BASC editions. Forthcoming research should seek to procure numerous sources of information and corroboration in order to maximize accuracy in detecting trauma histories among adjudicated youth. In summary, overall findings provide empirical support for using the BASC-2-SRP Trauma Composite to aid in accurately identifying previous trauma exposure(s) among female juvenile offenders.

Tables and Figures

All data visualization in this section used consistent color-coding to represent sample derivations. The color key used throughout this section is provided below.

- = No reported history of trauma
- = Reported history of trauma via procedural methods discussed in body of manuscript
- = Total sample: Combination of both trauma and non-trauma groups
- = Female gender
- = Male gender
- = Ethnicity

Table 2.1.1.

Demographic Characteristics (N = 315)	Frequency	Percentage
Gender		
Males	186	59.0%
Females	129	41.0%
Trauma History		
No Reported Trauma	187	59.4%
Reported Trauma	128	40.6%
Trauma Type		
Physical Abuse	14	10.9%
Sexual Abuse/Assault	19	14.8%
Neglect	4	3.1%
Grief and Loss	21	16.4%
Witnessed Domestic Violence	26	20.3%
Multiple Traumas	38	29.7%
Single Event Traumas	3	2.3%
Ethnicity		
African American	219	69.5%
White	56	17.8%
Latinx	28	8.9%
Multiracial	10	3.2%
Asian American	1	0.3%
Native American	1	0.3%

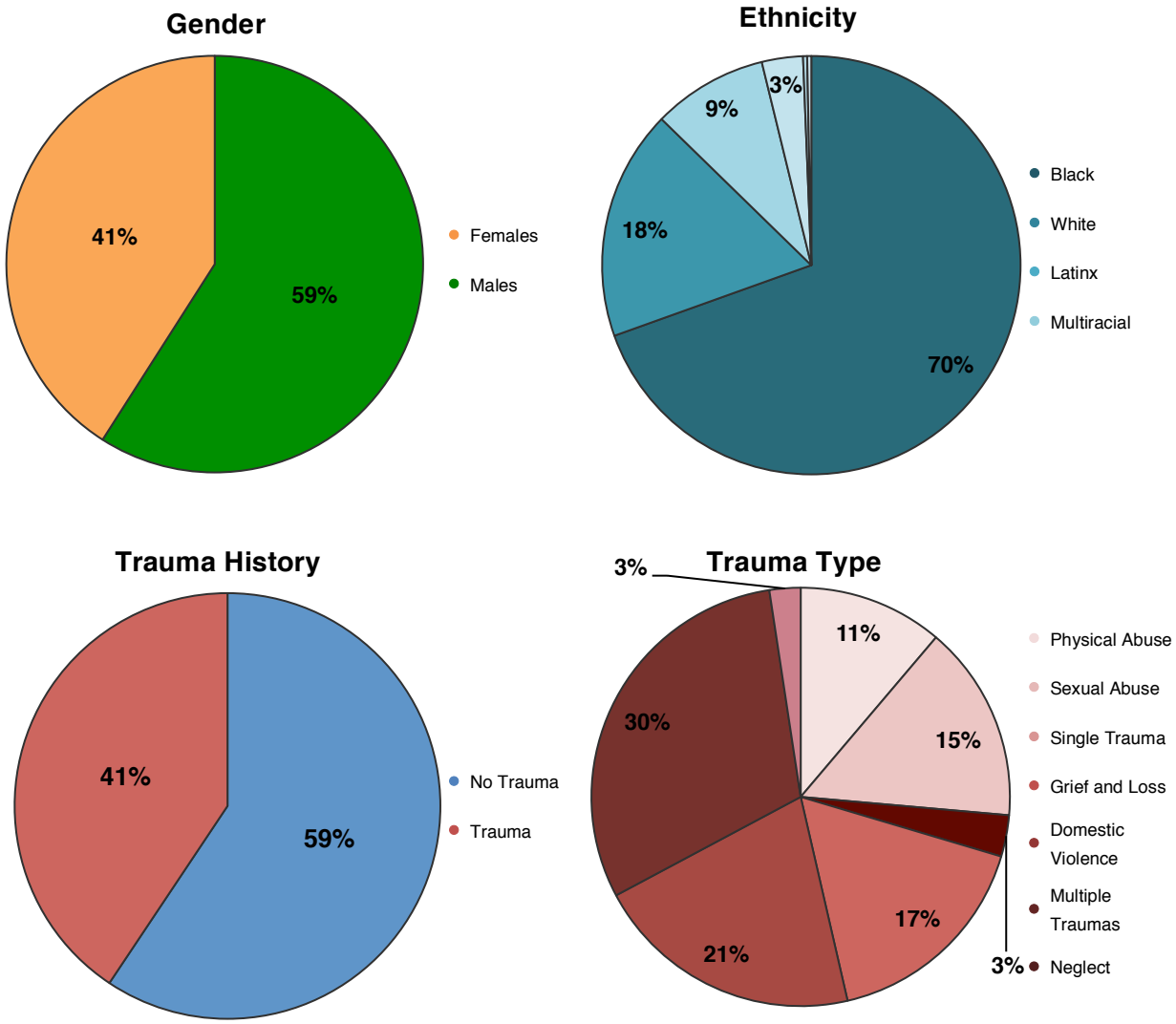


Figure 2.1.1. *Graphic Depiction of Demographic Characteristics*

Table 2.1.2.

Demographic Characteristics by Gender

	Males (*N* = 186)		Female (*N* = 129)	
	Frequency	Percentage	Frequency	Percentage
Trauma History				
No Reported Trauma	123	66.1%	64	49.6%
Reported Trauma	63	33.9%	65	50.4%
Trauma Type				
Physical Abuse	9	14.3%	5	7.7%
Sexual Abuse/Assault	4	6.3%	15	23.1%
Neglect	2	3.2%	2	3.1%
Grief and Loss	13	20.6%	8	12.3%
Witnessed Domestic Violence	12	19.1%	14	21.5%
Multiple Traumas	21	33.3%	20	30.8%
Single Event Trauma	2	3.2%	1	1.5%
Ethnicity				
African American	124	66.7%	95	73.6%
Anglo American	39	21.0%	17	13.2%
Latinx	16	8.6%	12	9.3%
Multiracial	5	2.7%	5	3.9%
Asian American	1	0.5%	0	0%
Native American	1	0.5%	0	0%

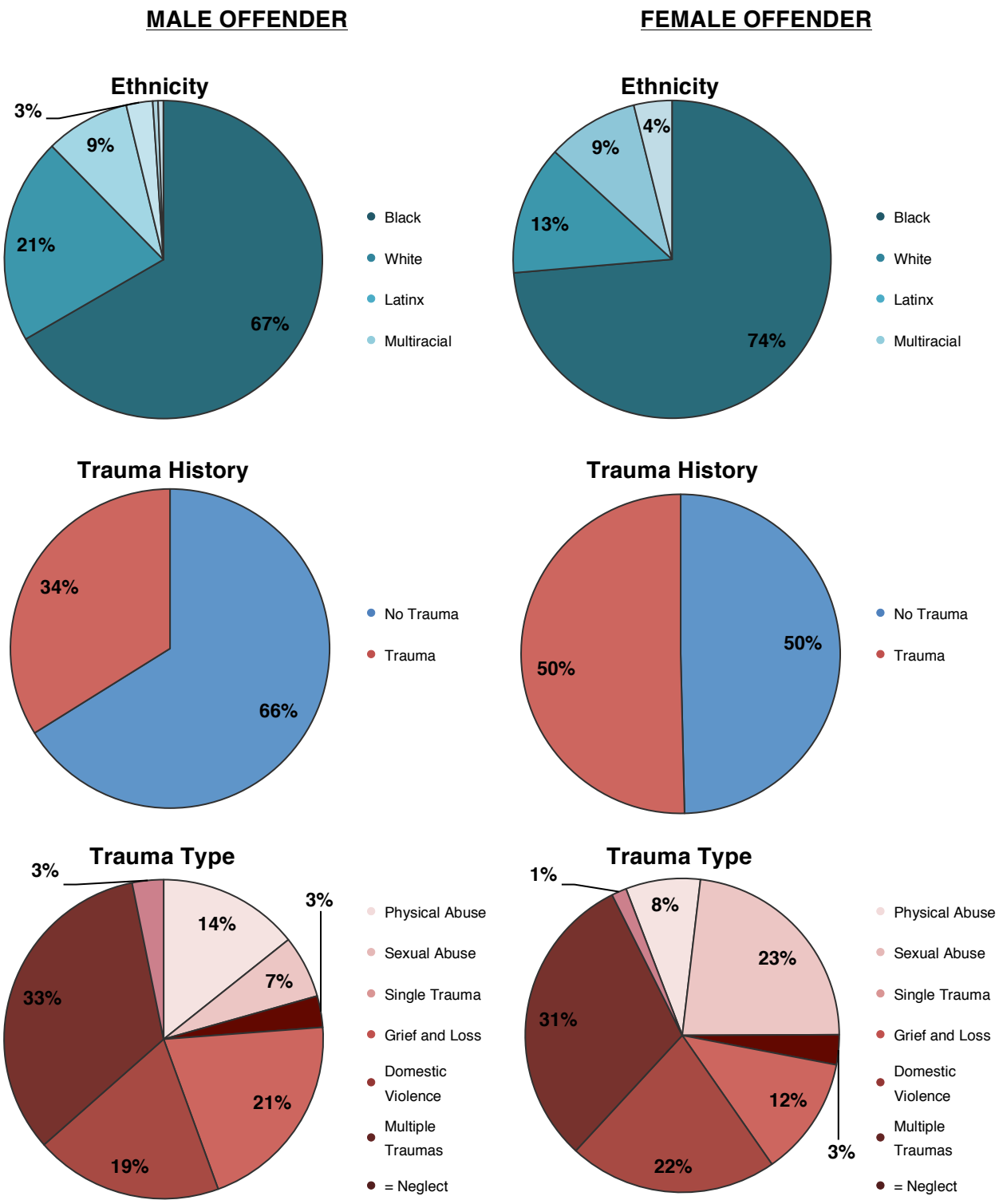


Figure 2.1.2. *Graphic Depiction of Demographic Characteristics by Gender*

Table 2.2.1.

Description of BASC-2-SRP Clinical Subscales

Scale	Description
Attitude to School	Thoughts and feelings of discontent with school
Attitude to Teachers	Thoughts and feelings of dislike of teachers
Atypicality	Bizarre thoughts and/or behaviors
Locus of Control	The belief that rewards and punishments are controlled by external means
Social Stress	Feelings of stress in personal relationships; a feeling of being excluded from social activities
Anxiety	Feelings of nervousness, worry, and fear
Depression	Feelings of unhappiness and sadness; a belief that nothing goes right
Sense of Inadequacy	Perceptions of being unsuccessful and unable to achieve one's goals
Attention Problems	Easily distracted and unable to concentrate
Hyperactivity	Overly active, rushing through activities, and acting before thinking
Sensation Seeking	The tendency to take risks and seek excitement
Somatization	The tendency to complain about or experience minor physical problems frequently

Table 2.1. Excerpted from Reynolds and Kamphaus (2004)

Table 2.2.2.

Description of BASC-2-SRP Adaptive Subscales

Scale	Description
Interpersonal Relations	Perceptions of having good social relationships
Relations with Parents	Positive thoughts and feelings towards parents; feeling of being valued by parents
Self-Esteem	Feelings of self-esteem, self-respect, and self-acceptance
Self-Reliance	Confidence in one's ability to solve problems and make decisions

Table 2.2. Excerpted from Reynolds and Kamphaus (2004)

Table 2.2.3.

Description of BASC-2-SRP Composite Scales

Scales	Description
School Problems	Pattern of dissatisfaction with school, teachers, and educational processes; includes the following scales: Attitude to School, Attitude to Teachers, and Sensation Seeking
Internalizing Problems	Pattern of self-directed distress; includes the following scales: Atypicality, Locus of Control, Social Stress, Somatization, Anxiety, Depression, and Sense of Inadequacy
Inattention/Hyperactivity	Pattern of inattentive and hyperactive feelings thoughts, and behaviors; includes the following scales: Attention Problems and Hyperactivity
Emotional Symptoms Index	Global indicator of problematic socioemotional functioning; includes the following scales: Social Stress, Anxiety, Depression, Sense of Inadequacy, Self-Esteem, and Self-Reliance
Personal Adjustment	Patterns of positive adjustment; includes the following scales: Relations, Self-Esteem, and Self-Reliance

Table 2.3. Excerpted from Reynolds and Kamphaus (2004)

Table 2.3.1.

Descriptive Statistics for BASC-2-SRP Scales: Total Sample

Total sample (N = 315)	*M*	*SD*	Skewness	Kurtosis
Attitude to School	50.62	11.02	0.650	-0.221
Attitude to Teachers	52.96	10.52	0.681	0.325
Sensation Seeking	50.37	8.97	0.157	-0.142
School Problems	**51.73**	**9.82**	**0.515**	**0.051**
Atypicality	47.77	6.81	1.192	0.900
Locus of Control	51.25	10.19	0.648	-0.148
Social Stress	46.93	8.45	0.447	-0.500
Anxiety	47.75	9.48	0.556	-0.231
Depression	49.88	9.06	1.133	0.864
Sense of Inadequacy	51.82	10.35	0.507	-0.427
Somatization	48.90	9.61	1.130	0.600
Internalizing Problems	**48.96**	**9.02**	**0.523**	**-0.144**
Attention Problems	54.15	10.57	0.058	-0.866
Hyperactivity	50.18	10.48	0.612	-0.072
Inattention/Hyperactivity	**52.40**	**10.35**	**0.264**	**-0.472**
Emotional Symptoms	**49.08**	**8.71**	**0.603**	**0.123**
Relations with Parents	45.91	11.50	-0.100	-0.828
Interpersonal Relations	53.55	7.08	-1.168	1.965
Self-Esteem	54.41	7.28	-1.372	1.842
Self-Reliance	46.13	10.34	-0.163	-0.437
Personal Adjustment	**50.03**	**8.93**	**-0.496**	**0.537**

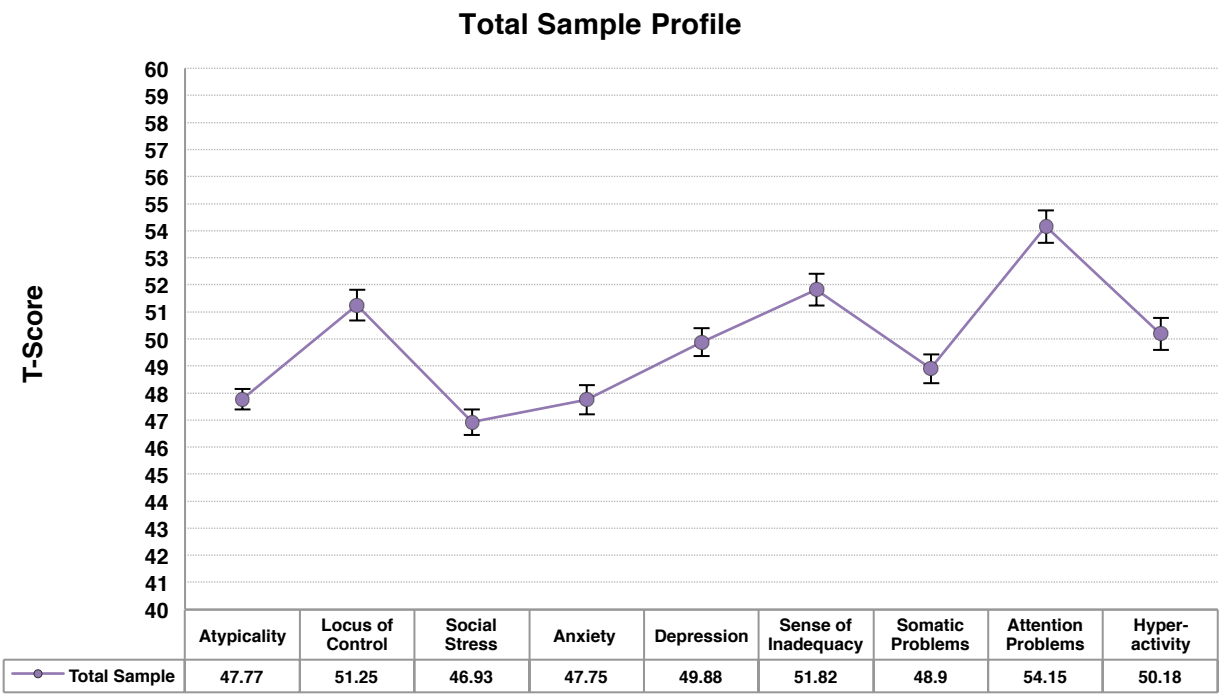
**Composite scales are in bold font*

Table 2.3.2.

Descriptive Statistics for BASC-2-SRP Scales by Gender

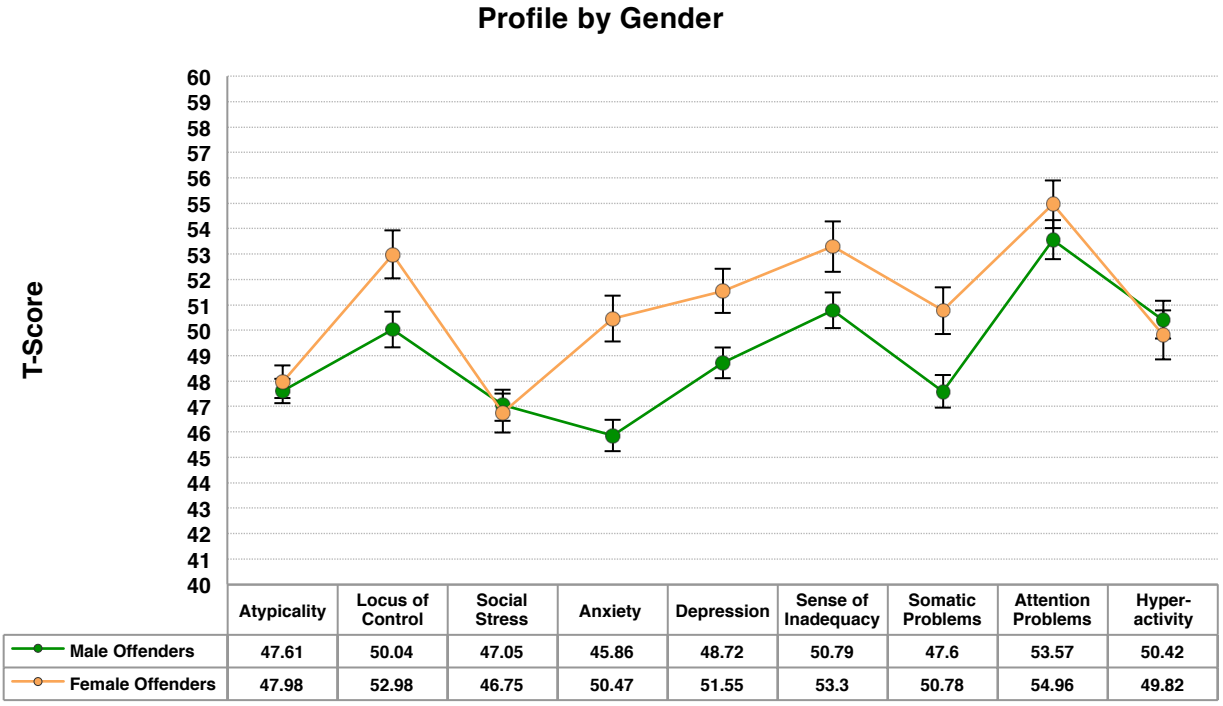
	Male Offenders *(N=186)*				Female Offenders *(N=129)*			
	M	*SD*	Skew.	Kurtosis	*M*	*SD*	Skew.	Kurtosis
Attitude to School	50.03	10.54	0.611	-0.124	51.47	11.66	0.662	-0.405
Attitude to Teachers	53.76	10.61	0.864	0.630	51.81	10.31	0.400	-0.356
Sensation Seeking	51.60	8.87	-0.092	0.198	48.60	8.86	0.539	-0.098
School Problems	**52.33**	**9.75**	**0.580**	**0.118**	**50.86**	**9.89**	**0.448**	**0.560**
Atypicality	47.61	6.49	1.233	1.207	47.98	7.27	1.135	0.560
Locus of Control	50.04	9.63	0.763	0.101	52.98	10.73	0.472	-0.379
Social Stress	47.05	8.28	0.421	-0.542	46.75	8.72	0.490	-0.428
Anxiety	45.86	8.41	0.662	0.274	50.47	10.28	0.279	-0.706
Depression	48.72	8.27	1.206	0.970	51.55	9.88	0.978	0.519
Sense of Inadequacy	50.79	9.53	0.584	0.027	53.30	11.30	0.340	-0.893
Somatization	47.60	8.75	1.284	1.130	50.78	10.49	0.903	0.005
Internalizing Problems	**47.83**	**8.27**	**0.538**	**-0.242**	**50.59**	**9.80**	**0.391**	**-0.254**
Attention Problems	53.57	10.53	0.175	-0.777	54.96	10.62	-0.111	-0.909
Hyperactivity	50.42	10.20	0.550	-0.103	49.82	10.90	0.703	0.009
Inattention/Hyperactive	**52.17**	**10.13**	**0.304**	**-0.345**	**52.74**	**10.69**	**0.207**	**-0.604**
Emotional Symptoms	**48.34**	**8.15**	**0.674**	**0.269**	**50.15**	**9.39**	**0.465**	**-0.080**
Relations with Parents	46.88	10.85	-0.219	-0.585	44.52	12.27	0.092	-1.020
Interpersonal Relations	52.90	6.77	-1.192	2.338	54.48	7.43	-1.258	1.887
Self-Esteem	55.23	6.75	-1.684	3.067	53.24	7.86	-1.028	0.903
Self-Reliance	45.27	10.38	-0.040	-0.320	47.37	10.21	-0.347	-0.461
Personal Adjustment	**50.24**	**8.34**	**-0.624**	**0.720**	**49.74**	**9.75**	**-0.353**	**0.301**

**Composite scales are in bold font*



	Atypicality	Locus of Control	Social Stress	Anxiety	Depression	Sense of Inadequacy	Somatic Problems	Attention Problems	Hyper-activity
Total Sample	47.77	51.25	46.93	47.75	49.88	51.82	48.9	54.15	50.18

** Error bars demarcate standard error of measurement (SEM) for each variable*



	Atypicality	Locus of Control	Social Stress	Anxiety	Depression	Sense of Inadequacy	Somatic Problems	Attention Problems	Hyper-activity
Male Offenders	47.61	50.04	47.05	45.86	48.72	50.79	47.6	53.57	50.42
Female Offenders	47.98	52.98	46.75	50.47	51.55	53.3	50.78	54.96	49.82

** Error bars demarcate standard error of measurement (SEM) for each variable*

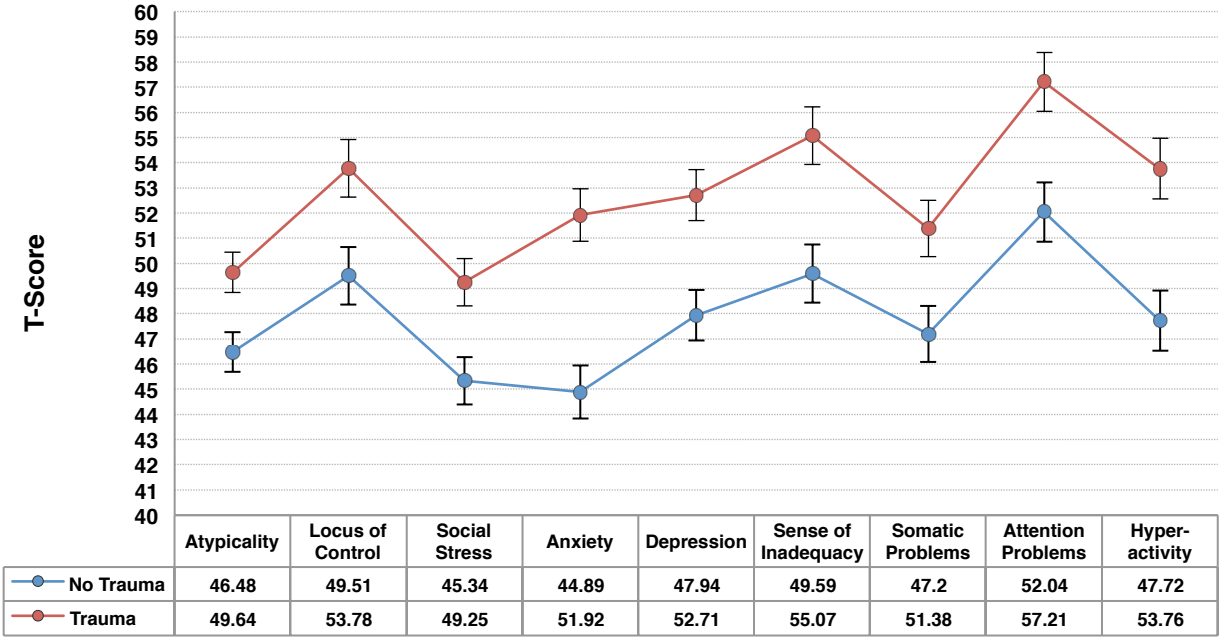
Figure 2.2. *BASC-2 Clinical Subscale Profile: Total Sample and by Gender*

Table 2.4.1.

Mean Comparisons of BASC-2 Clinical Scales by Trauma Group

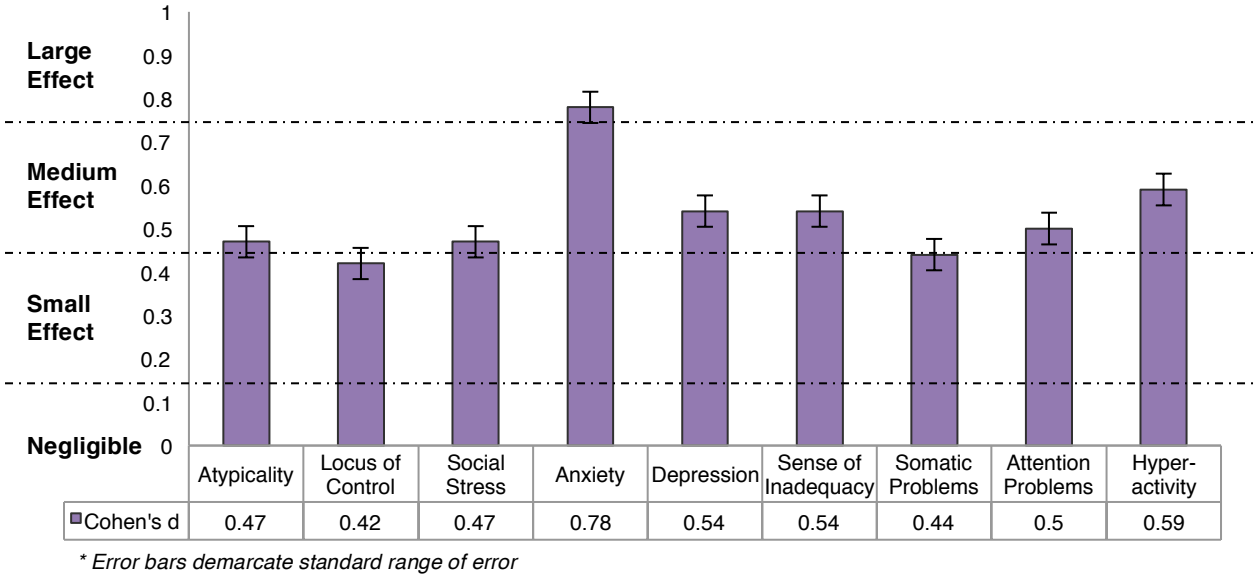
	No Trauma Group			Trauma Group				
Total Sample *(N = 315)*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M* Diff.	*t*
Atypicality	46.48	5.95	187	49.64	7.54	128	-3.15	-3.961***
Locus of Control	49.51	9.68	187	53.78	10.41	128	-4.26	-3.725***
Social Stress	45.34	8.11	187	49.25	8.43	128	-3.91	-4.140***
Anxiety	44.89	8.11	187	51.92	9.82	128	-7.02	-6.677***
Depression	47.94	8.36	187	52.71	9.32	128	-4.77	-4.751***
Sense of Inadequacy	49.59	9.53	187	55.07	10.67	128	-5.48	-4.774***
Somatization	47.20	8.72	187	51.38	10.33	128	-4.17	-3.747***
Attention Problems	52.04	10.20	187	57.21	10.40	128	-5.16	-4.375***
Hyperactivity	47.72	9.24	187	53.76	11.18	128	-6.03	-5.043***

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



** Error bars demarcate standard error of distance for between group variables*

Figure 2.3.1a. *BASC-2 Clinical Subscale Profiles by Trauma History: Total Sample*



** Error bars demarcate standard range of error*

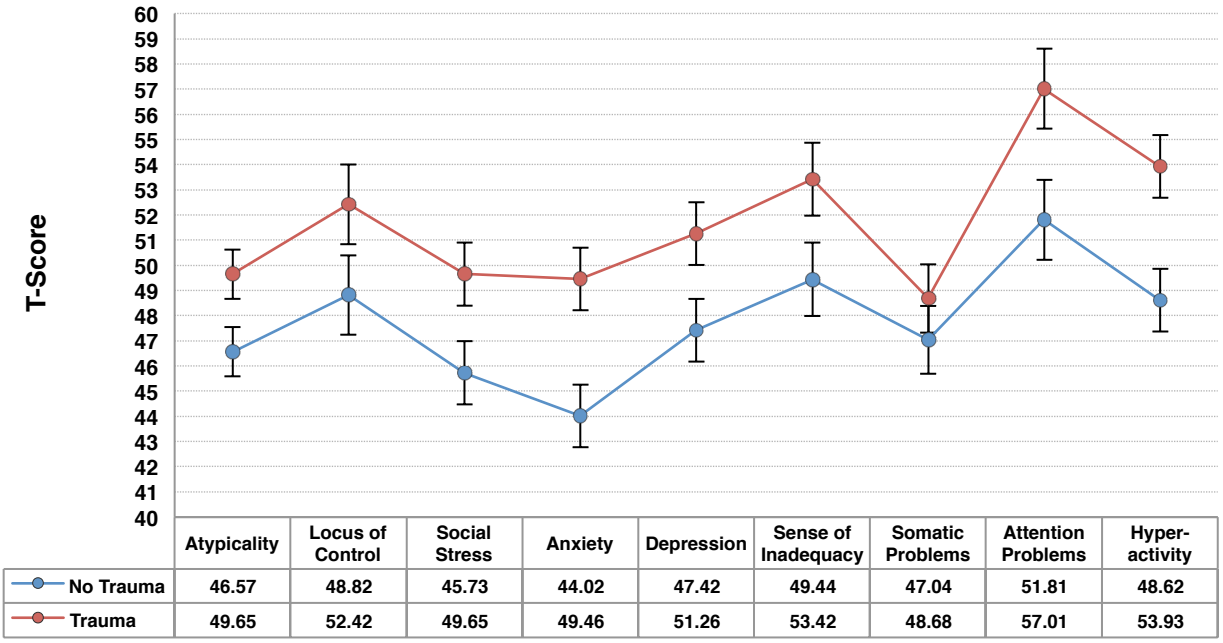
Figure 2.3.1b. *Magnitude of Mean Differences by Trauma History: Total Sample*

Table 2.4.2.

Mean Comparisons of BASC-2 Clinical Scales by Trauma Group: Males

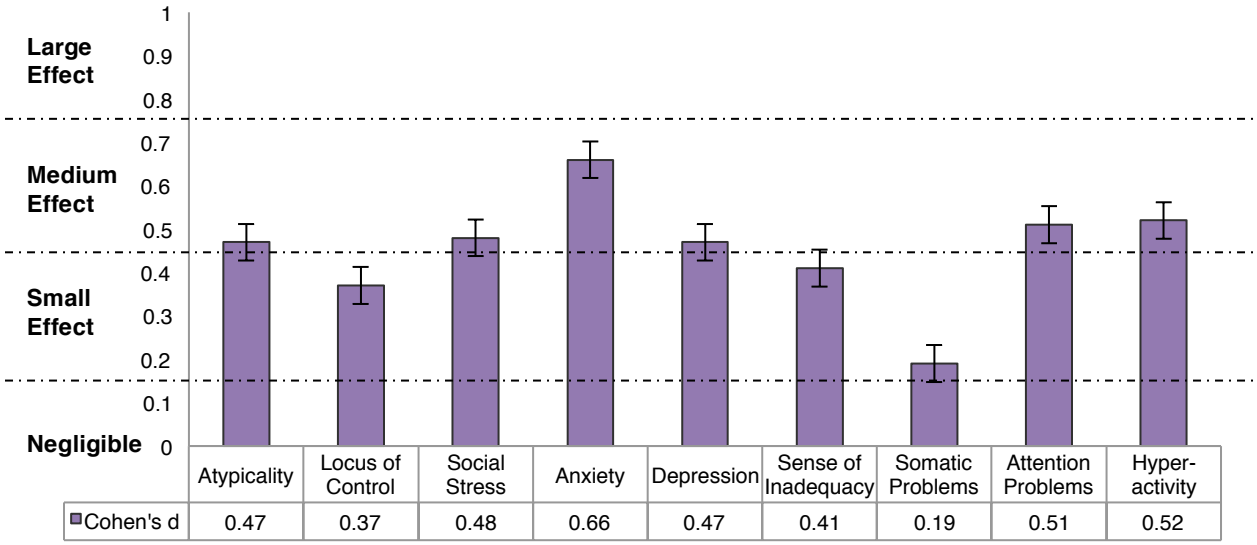
	No Trauma Group			Trauma Group				
Males *(N =186)*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M* Diff.	*t*
Atypicality	46.57	6.01	123	49.65	6.94	63	-3.07	-3.13**
Locus of Control	48.82	8.72	123	52.42	10.89	63	-3.60	-2.28*
Social Stress	45.73	8.02	123	49.65	8.21	63	-3.91	-3.13**
Anxiety	44.02	7.65	123	49.46	8.71	63	-5.43	-4.37***
Depression	47.42	7.81	123	51.26	8.62	63	-3.84	-3.07**
Sense of Inadequacy	49.44	8.87	123	53.42	10.27	63	-3.98	-2.74**
Somatization	47.04	8.95	123	48.68	8.31	63	-1.63	-1.21
Attention Problems	51.81	10.26	123	57.01	10.28	63	-5.20	-3.27***
Hyperactivity	48.62	9.21	123	53.93	11.18	63	-5.31	-3.46***

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



** Error bars demarcate standard error of distance for between group variables*

Figure 2.3.2a. *BASC-2 Clinical Subscale Profiles by Trauma History: Male Offenders*



** Error bars demarcate standard range of error*

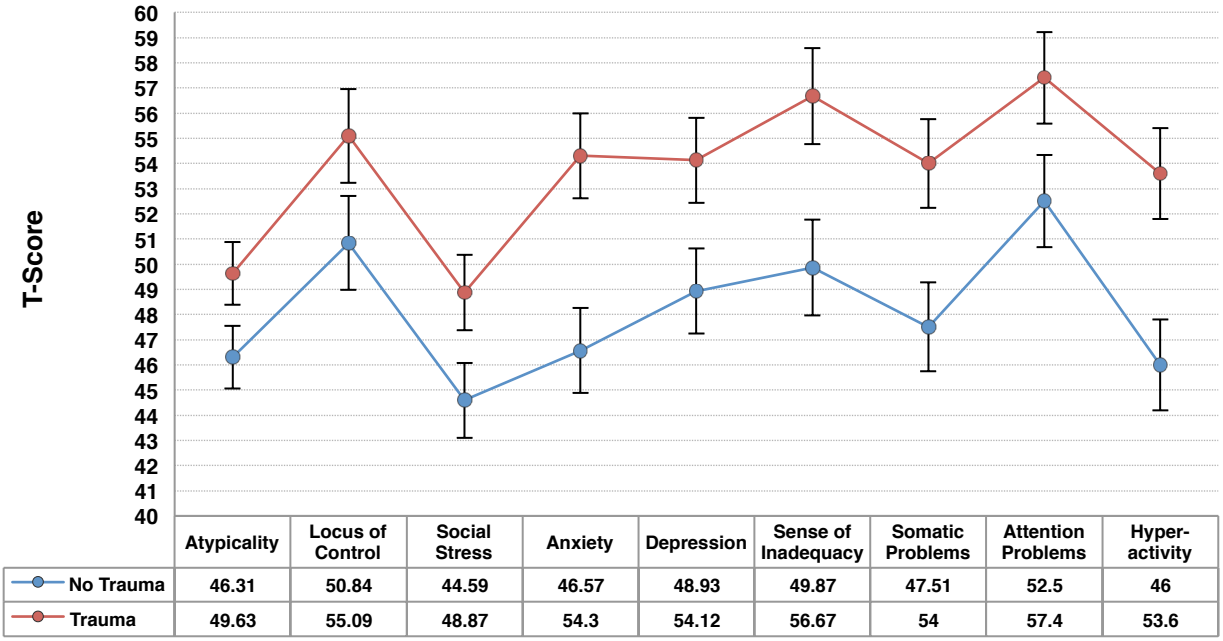
Figure 2.3.2b. *Magnitude of Mean Differences by Trauma History: Male Offenders*

Table 2.4.3.

Mean Comparisons of BASC-2 Clinical Scales by Trauma Group: Females

	No Trauma Group			Trauma Group				
Females *(N =129)*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M* Diff.	*t*
Atypicality	46.31	5.88	64	49.63	8.13	65	-3.31	-2.657**
Locus of Control	50.84	11.25	64	55.09	9.83	65	-4.24	-2.284*
Social Stress	44.59	8.27	64	48.87	8.69	65	-4.28	-2.865**
Anxiety	46.57	8.74	64	54.30	10.31	65	-7.72	-4.589***
Depression	48.93	9.30	64	54.12	9.82	65	-5.18	-3.077**
Sense of Inadequacy	49.87	10.76	64	56.67	10.88	65	-6.80	-3.568***
Somatization	47.51	8.33	64	54.00	11.43	65	-6.48	-3.685***
Attention Problems	52.50	10.15	64	57.40	10.59	65	-4.90	-2.681**
Hyperactivity	46.00	9.12	64	53.60	11.27	65	-7.60	-4.206***

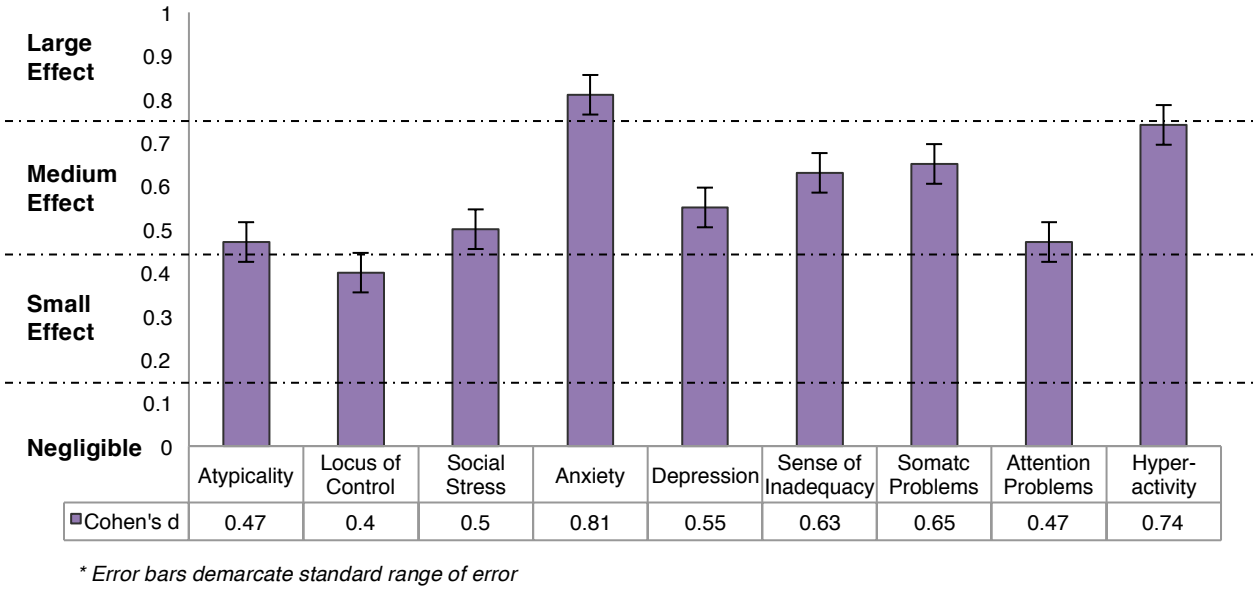
* = $p<.05$, ** = $p<.01$, *** = $p<.001$



	Atypicality	Locus of Control	Social Stress	Anxiety	Depression	Sense of Inadequacy	Somatic Problems	Attention Problems	Hyper-activity
No Trauma	46.31	50.84	44.59	46.57	48.93	49.87	47.51	52.5	46
Trauma	49.63	55.09	48.87	54.3	54.12	56.67	54	57.4	53.6

** Error bars demarcate standard error of distance for between group variables*

Figure 2.3.3a. *BASC-2 Clinical Subscale Profiles by Trauma History: Female Offenders*



** Error bars demarcate standard range of error*

Figure 2.3.3b. *Magnitude of Mean Differences by Trauma History: Female Offenders*

Table 2.5.1a.

Clinical Scale Canonical Function for Discriminating Trauma: Total Sample

Combined Gender (N = 315)	λ	*Canonical* r^2	χ^2	*Coefficient*
Clinical Subscales	.842	.40	52.99***	--
Anxiety				.658
Hyperactivity				.408
Depression				.183
Somatization				.103
Attention Problems				.068
Sense of Inadequacy				.050
Atypicality				-.016
Social Stress				-.093
Locus of Control				-.096

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

Table 2.5.1b.

Functions at Group Centroids: Total Sample

	No Trauma History	Trauma History	Cutoff Centroid
Combined Gender (N = 315)	-.357	.522	.083

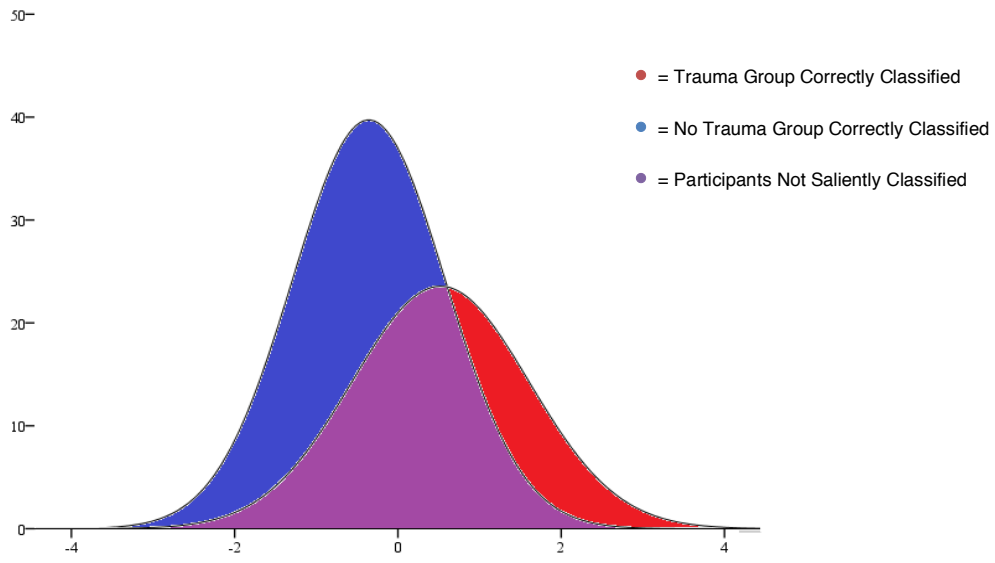


Figure 2.4.1a. *Canonical Group Distribution for Clinical Scales: Total Sample**

* Scatterplot Matrices by group can be found in Appendix D.

Table 2.5.1c.

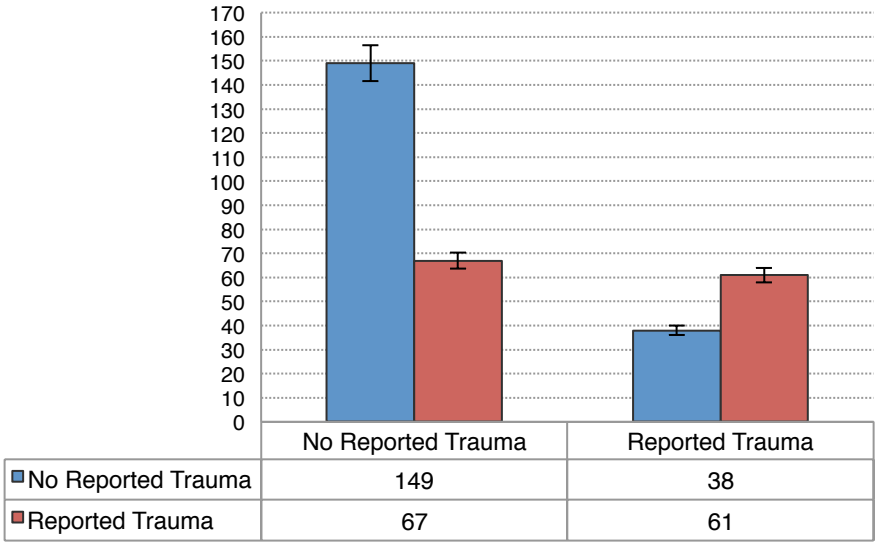
Structure Matrix of Clinical Scale Function Discriminating Trauma Groups

Combined Gender (N = 315)	*Loading*
Anxiety	.899
Hyperactivity	.676
Depression	.638
Sense of Inadequacy	.623
Attention Problems	.567
Social Stress	.545
Atypicality	.542
Somatization	.511
Locus of Control	.491

Table 2.5.1d.

Cross-Validated Clinical Scale Function Group Assignment: Total Sample

	Predicted		
Cross-Validated (N = 315)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	149	38	79.7%
Reported Trauma	67	61	47.7%
Overall Percentage			66.7%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.4.1b. *Cross-Validated Clinical Scale Function for Group Classification*

Table 2.5.2a.

Clinical Scale Canonical Function for Discriminating Trauma: Males

Male Offenders (N = 186)	λ	Canonical r^2	χ^2	*Coefficient*
Clinical Subscales	.876	.35	23.77**	--
Anxiety				.632
Hyperactivity				.272
Attention Problems				.311
Depression				.197
Atypicality				.175
Social Stress				.013
Sense of Inadequacy				-.053
Locus of Control				-.132
Somatization				-.269

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

Table 2.5.2b.

Functions at Group Centroids: Males

	No Trauma History	Trauma History	Centroid Cutoff
Male Offenders (N = 186)	-.268	.523	.128

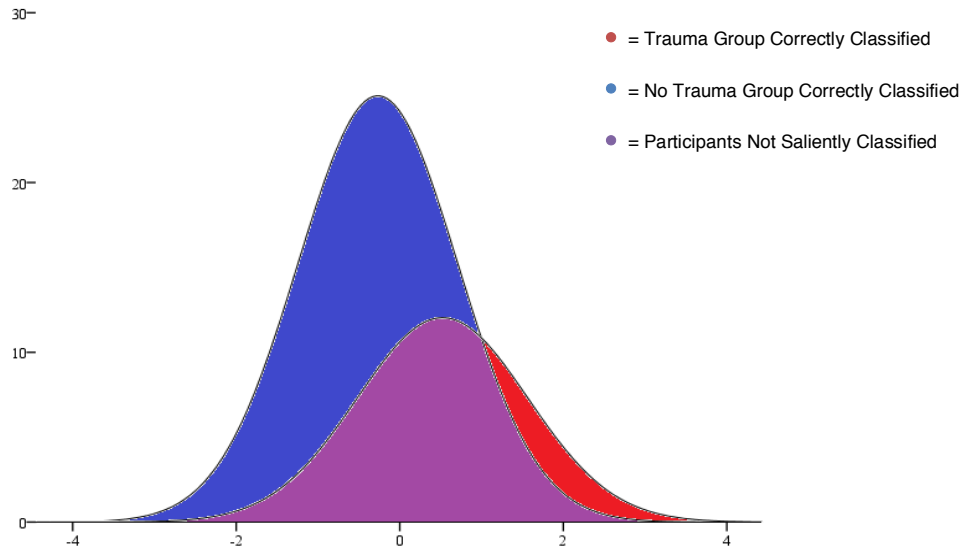


Figure 2.4.2a. *Canonical Group Distribution for Clinical Scales: Males**

* Scatterplot Matrices by group can be found in Appendix D.

Table 2.5.2c.

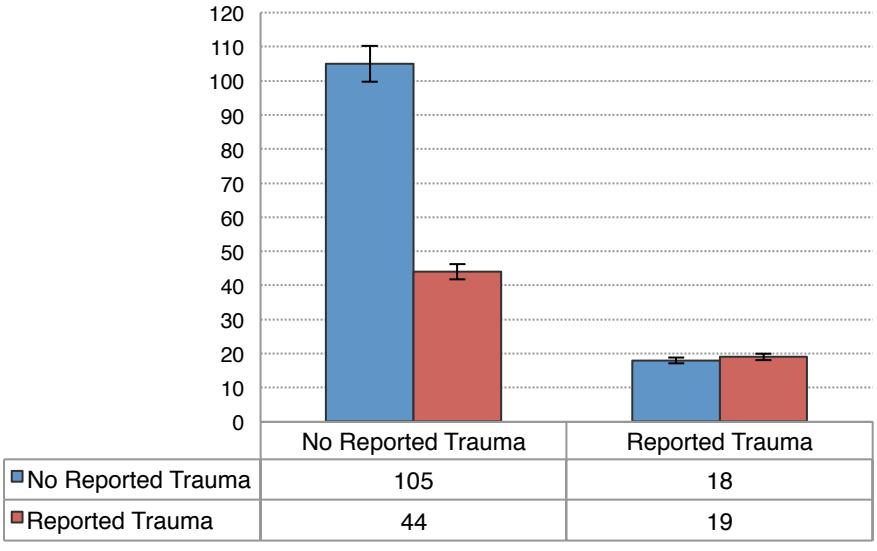
Structure Matrix of Clinical Scale Trauma Function: Males

Males (N = 186)	*Loading*
Anxiety	.856
Hyperactivity	.664
Attention Problems	.641
Atypicality	.622
Social Stress	.618
Depression	.616
Sense of Inadequacy	.531
Locus of Control	.467
Somatization	.254

Table 2.5.2d.

Cross-Validated Clinical Scale Function Group Assignment: Males

	Predicted		
Cross-Validated (N = 186)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	105	18	85.4%
Reported Trauma	44	19	30.2%
Overall Percentage			66.7%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.4.2b. *Cross-Validated Clinical Scale Function for Group Classification: Males*

Table 2.5.3a.

Clinical Scale Canonical Function for Discriminating Trauma: Females

Female Offenders (N = 129)	λ	Canonical r^2	χ^2	*Coefficient*
Clinical Subscales	.786	.46	29.52***	--
Hyperactivity				.573
Anxiety				.418
Somatization				.393
Sense of Inadequacy				.236
Depression				.176
Social Stress				-.058
Locus of Control				-.114
Attention Problems				-.140
Atypicality				-.189

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

Table 2.5.3b.

Functions at Group Centroids: Females

	No Trauma History	Trauma History	Centroid Cutoff
Female Offenders (N = 129)	-.522	.514	-.004

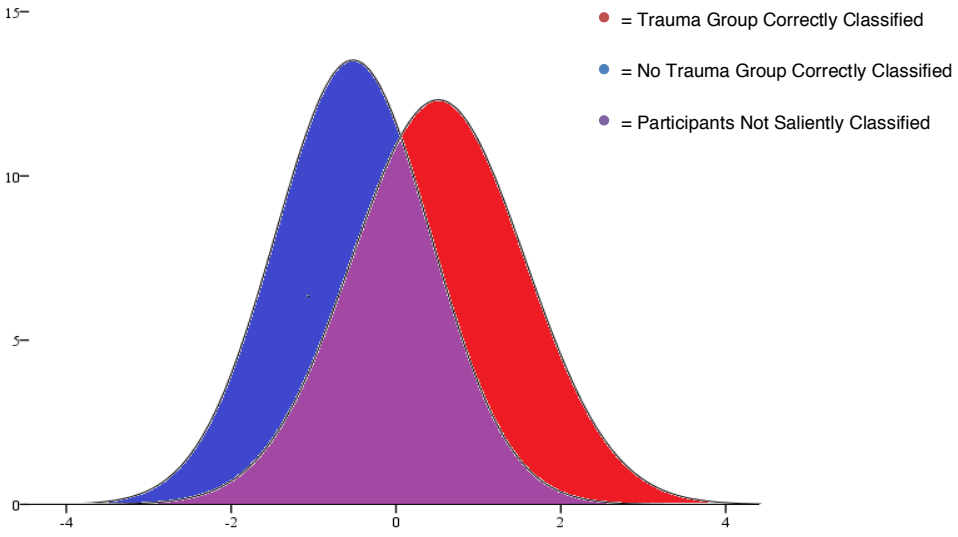


Figure 2.4.3a. *Canonical Group Distribution for Clinical Scales: Females**

* Scatterplot Matrices by group can be found in Appendix D.

Table 2.5.3c.

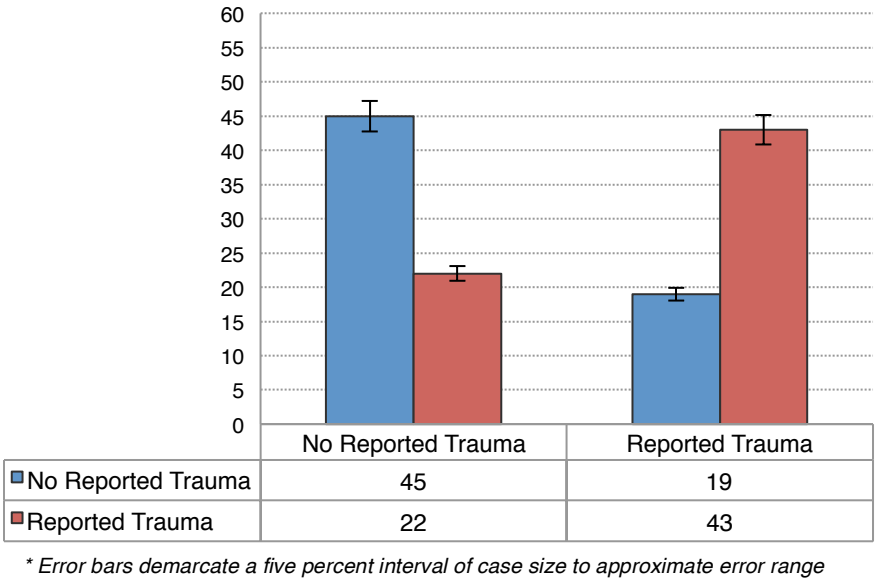
Structure Matrix of Clinical Scale Trauma Function: Females

Females (N = 129)	*Loading*
Anxiety	.775
Hyperactivity	.719
Somatization	.625
Sense of Inadequacy	.617
Depression	.542
Social Stress	.493
Attention Problems	.448
Atypicality	.448
Locus of Control	.408

Table 2.5.3d.

Cross-Validated Clinical Scale Function Group Assignment: Females

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	45	19	70.3%
Reported Trauma	22	43	66.2%
Overall Percentage			68.2%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.4.3b. *Cross-Validated Clinical Scale Function for Group Classification: Females*

Table 2.6.

Reliability of Included BASC-2 Clinical Subscale Items

Subscales	Total Number of Items	Number of Items Omitted*	Number of Items Included	Cronbach's Alpha of Included Items
Anxiety	13	2	11	.83
Hyperactivity	7	0	7	.73
Somatization	7	3	4	.70
Sense of Inadequacy	10	1	9	.79
Depression	12	3	9	.76
Social Stress	10	0	10	.75
Attention Problems	9	4	5	.74
Atypicality	9	2	7	.61
Locus of Control	9	2	7	.72

** Items not retained in the BASC-3 were omitted from analyses*

Table 2.7.1a.

Stepwise Structure of Atypicality Items Discriminating Trauma

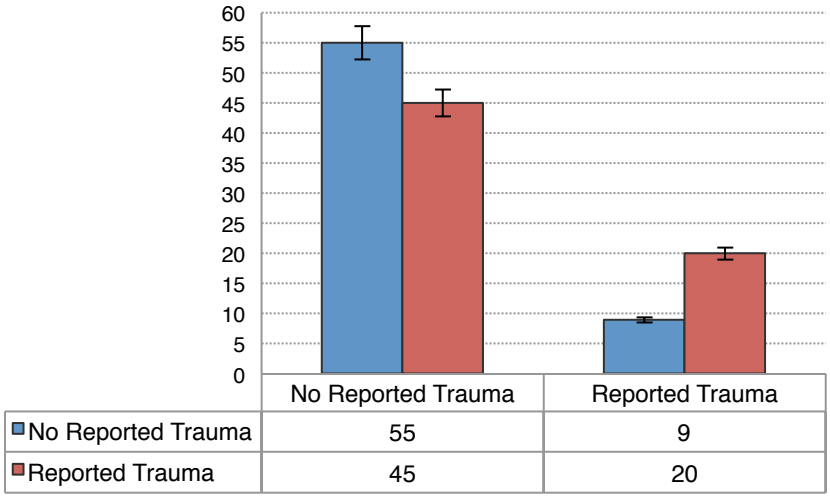
Females (N = 129)	*Loading*
130. I see weird things	**1.000***
160. I hear things that others cannot hear	.450
62. Sometimes, when alone, I hear my name	.397
119. Even when alone, I feel like someone is watching me	.258
152. I do things over and over and can't stop	.186
92. I feel like people are out to get me	.144
100. Someone wants to hurt me	.086

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.1b.

Cross-Validated Atypicality Item Function Group Assignment

	Predicted		
Cross-Validated (N=129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	55	9	85.9%
Reported Trauma	45	20	30.8%
Overall Percentage			58.1%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.1. *Cross-Validated Atypicality Function Assigning Group Membership*

Table 2.7.2a.

Stepwise Structure of Locus of Control Items Discriminating Trauma

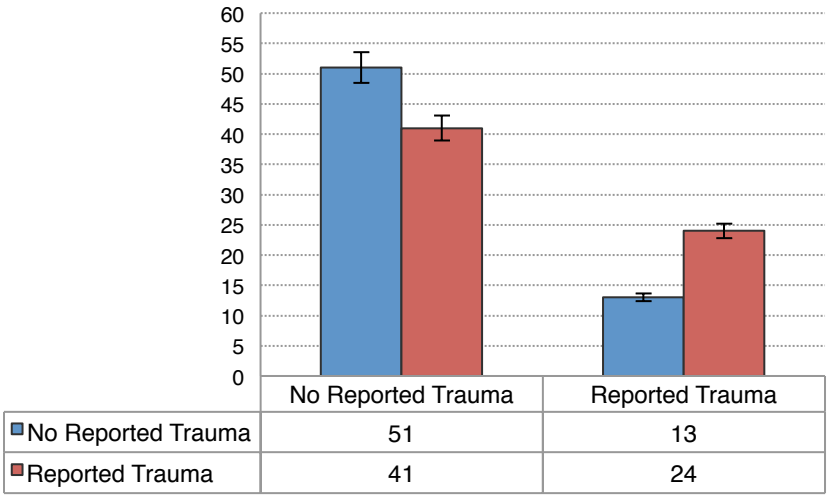
Females (N = 129)	*Loading*
79. I get blamed for things I can't help	**1.000***
139. I am blamed for things I don't do	.508
169. People get mad at me, even when I don't do anything wrong	.314
6. Things go wrong for me, even when I try hard	.309
66. My parents blame too many of their problems on me	.298
36. My parents have too much control over my life	.184
19. What I want never seems to matter	.153

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.2b.

Cross-Validated Locus of Control Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	51	13	79.7%
Reported Trauma	41	24	36.9%
Overall Percentage			58.1%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.2. *Cross-Validated Locus of Control Function Assigning Group Membership*

Table 2.7.3a.

Stepwise Structure of Social Stress Items Discriminating Trauma

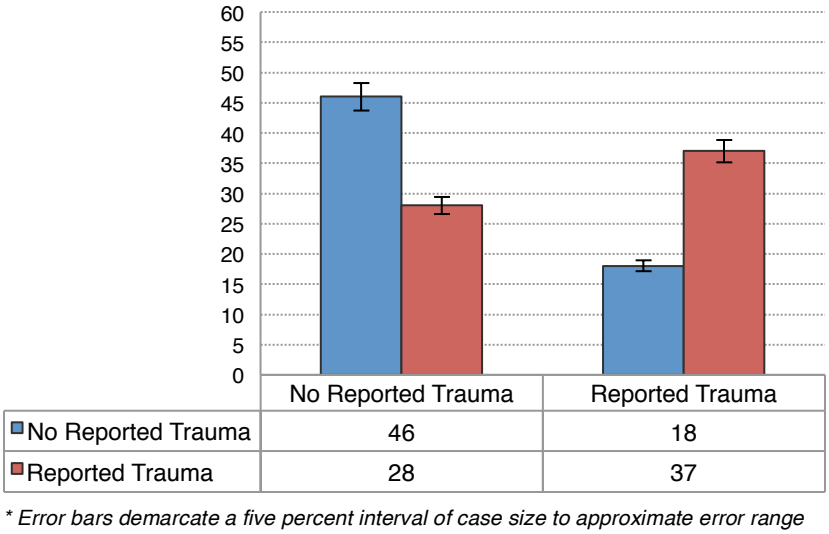
Females (N = 129)	*Loading*
75. People say bad things to me	**.801***
135. Other people find things wrong with me	**.779***
176. Other people are against me	.489
116. I am left out of things	.450
86. People act as if they don't hear me	.425
165. I feel that others do not like the way I do things	.420
146. I feel out of place around people	.334
105. I am lonely	.300
56. Other children are happier than I am	.209
26. My friends have more fun than I do	.131

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.3b.

Cross-Validated Social Stress Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	46	18	71.9%
Reported Trauma	28	37	56.9%
Overall Percentage			64.3%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.3. *Cross-Validated Social Stress Function Assigning Group Membership*

Table 2.7.4a.

Stepwise Structure of Anxiety Items Discriminating Trauma

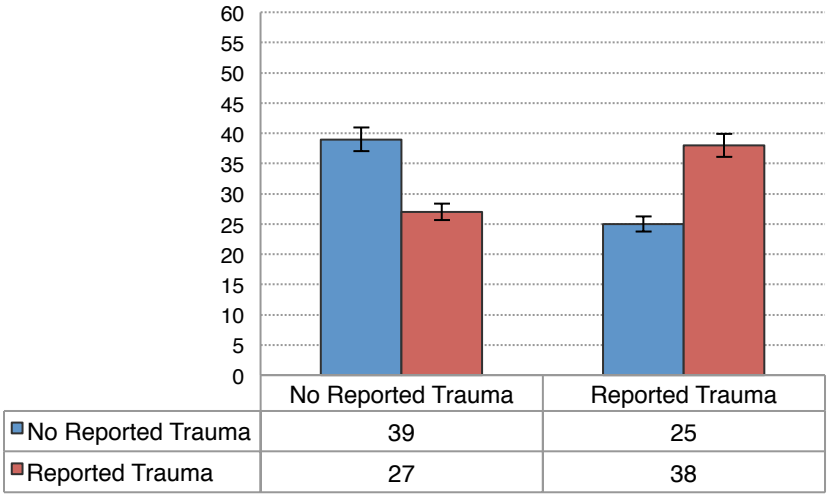
Females (N = 129)	*Loading*
41. I worry a lot of the time	**.850***
110. I worry but I don't know why	**.802***
140. I worry about what is going to happen	.533
80. I worry when I go to bed at night	.456
131. I get nervous when things do not go the right way for me	.445
50. I often worry about something bad happening to me	.410
101. I feel guilty about things	.384
108. I get nervous	.375
138. Little things bother me	.337
71. I get so nervous I can't breathe	.323
11. I can never seem to relax	.194

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7d2.

Cross-Validated Anxiety Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	39	25	60.9%
Reported Trauma	27	38	58.5%
Overall Percentage			59.7%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.4. *Cross-Validated Anxiety Function Assigning Group Membership*

Table 2.7.5a.

Stepwise Structure of Depression Items Discriminating Trauma

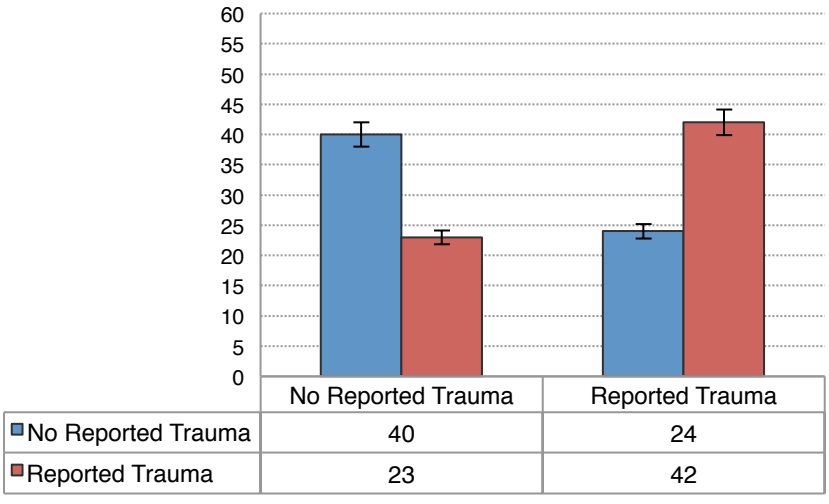
Females (N = 129)	*Loading*
81. I feel like my life is getting worse and worse	**.814***
111. I feel sad	**.770***
93. I feel depressed	.487
38. I just don't care anymore	.368
51. I don't seem to do anything right	.340
98. No one understands me	.325
8. I used to be happier	.322
68. Nothing about me is right	.303
63. Nothing ever goes right for me	.229

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.5b.

Cross-Validated Depression Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	40	24	62.5%
Reported Trauma	23	42	64.6%
Overall Percentage			63.6%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.5. *Cross-Validated Depression Function Assigning Group Membership*

Table 2.7.6a.

Stepwise Structure of Sense of Inadequacy Items Discriminating Trauma

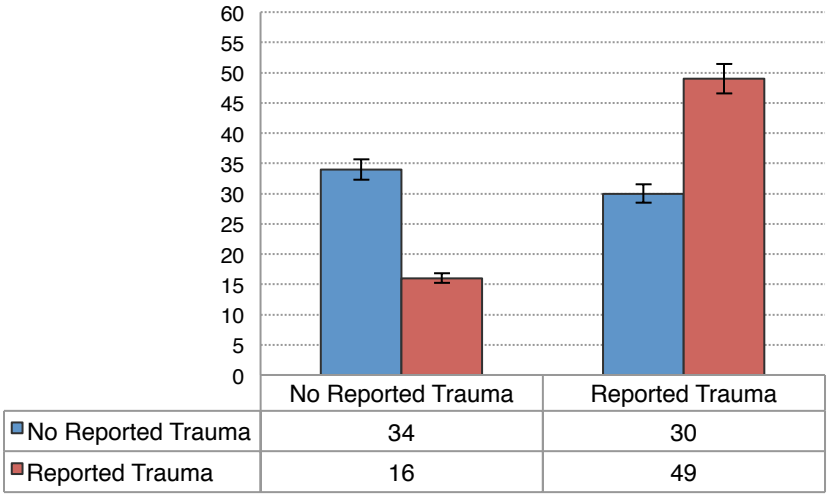
Females (N = 129)	*Loading*
120. I want to do better, but I can't	**1.000***
84. Even when I try, I fail	.439
114. When I take tests, I can't think	.372
90. I am disappointed with my grades	.333
144. I fail at things	.326
150. I quit easily	.311
54. Most things are harder for me than for others	.284
60. I never quite reach my goal	.189
24. I never seem to get anything right	.057

**Bolded items were retained in the analysis; all other items were removed from predictive model.*

Table 2.7.6b.

Cross-Validated Sense of Inadequacy Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	34	30	53.1%
Reported Trauma	16	49	75.4%
Overall Percentage			64.3%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.6. *Cross-Validated Sense of Inadequacy Function Assigning Membership*

Table 2.7.7a.

Stepwise Structure of Somatization Items Discriminating Trauma

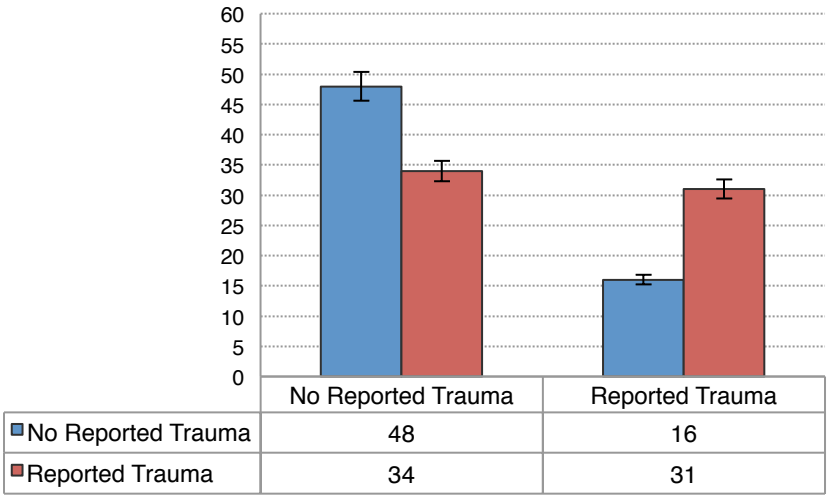
Females (N = 129)	*Loading*
99. I feel dizzy	**1.000***
34. Often I feel sick	.375
69. My stomach gets upset more than most people's	.334
64. I get sick more than others	.192

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.7b.

Cross-Validated Somatization Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	48	16	75.0%
Reported Trauma	34	31	47.7%
Overall Percentage			61.2%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.7. *Cross-Validated Somatization Function Assigning Group Membership*

Table 2.7.8a.

Stepwise Structure of Attention Problems Items Discriminating Trauma

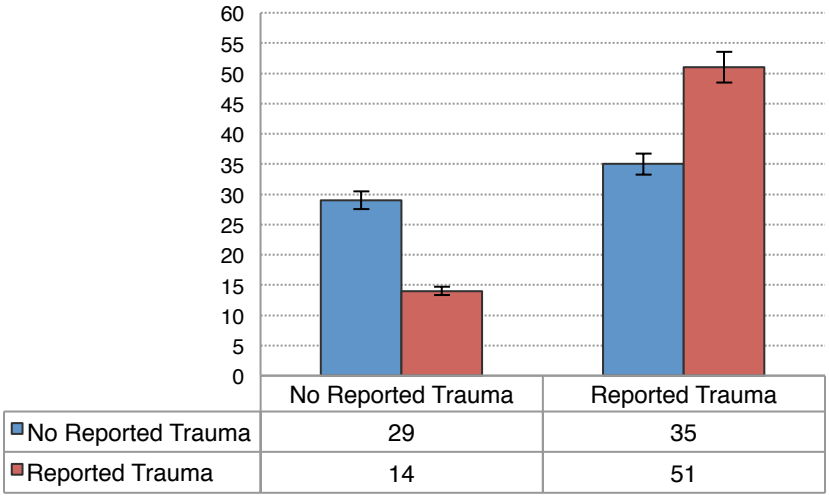
Females (N = 129)	*Loading*
143. I have trouble paying attention to what I am doing	**1.000***
113. I have trouble paying attention to the teacher	.446
53. I have attention problems	.359
5. People tell me I should pay attention	.263
35. I think that I have a short attention span	.255

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.8b.

Cross-Validated Attention Problems Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	29	35	45.3%
Reported Trauma	14	51	78.5%
Overall Percentage			62.0%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.8. *Cross-Validated Attention Problems Function Assigning Group Membership*

Table 2.7.9a.

Stepwise Structure of Hyperactivity Items Discriminating Trauma

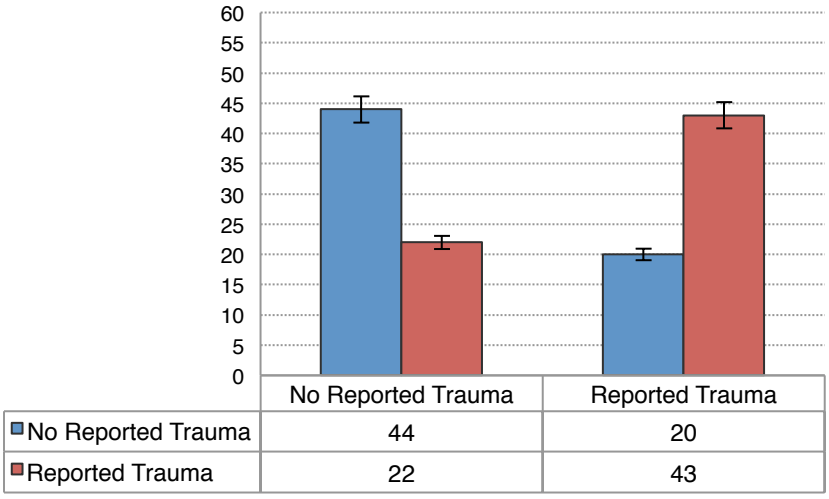
Females (N = 129)	*Loading*
154. People tell me to be still	**.844***
164. People tell me that I am too noisy	**.606***
124. I have trouble sitting still	.477
88. I have trouble standing still in lines	.456
134. I feel like I have to get up and move around	.338
148. I talk without waiting for others to say something	.223
118. I talk while other people are talking	.210

**Bolded items were retained in the analysis; all other items were removed from predictive model*

Table 2.7.9b.

Cross-Validated Hyperactivity Item Function Group Assignment

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	44	20	68.8%
Reported Trauma	22	43	66.2%
Overall Percentage			67.4%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.5.9. *Cross-Validated Hyperactivity Function Assigning Group Membership*

Table 2.8.1.

PDA Output for BASC-2-SRP Clinical Subscales for Females

Clinical Subscales	λ	Canonical r^2	χ^2	Prob.
Atypicality	.956	.21	5.83	.017
Locus of Control	.958	.20	5.38	.020
Social Stress	.867	.36	17.95	< .001
Anxiety	.853	.38	20.10	< .001
Depression	.912	.30	7.84	.003
Sense of Inadequacy	.942	.24	7.58	.006
Somatization	.924	.28	10.00	.002
Attention Problems	.961	.20	4.99	.025
Hyperactivity	.813	.43	26.12	< .001

Table 2.8.2.

Stepwise PDA Output for Trauma Composite Items

Clinical Subscale Items	Subscale of Origin	*F*	Prob.
“I see weird things”	Atypicality	5.67[+]	.017
“I get blamed for things I can’t help”	Locus of Control	5.52[+]	.020
“People say bad things to me”	Social Stress	12.47	.001
“Other people find things wrong with me”	Social Stress	9.65	< .001
“I worry a lot of the time”	Anxiety	15.87	< .001
“I worry but I don't why”	Anxiety	10.90	< .001
“I feel sad”	Depression	6.07	.003
“I feel like my life is getting worse and worse”	Depression	8.10	.005
“I want to do better, but I can't”	Sense of Inadequacy	7.84	.006
“I feel dizzy”	Somatization	10.45	.002
“I have trouble paying attention to what I am doing”	Attention Problems	5.11	.025
“People tell me to be still”	Hyperactivity	20.86	< .001
“People tell me that I am too noisy”	Hyperactivity	14.51	< .001

[+] *Items excluded from final predictive model due to poor factor loading in PDA of Trauma Composite (r < .32)*

Table 2.9.1.

Canonical Function of Trauma Composite for Discriminating Groups

Female Offenders (N = 129)	λ	Canonical r^2	χ^2	*Coefficient*
Trauma Composite Items	.653	.59	51.76***	--
154. People tell me to be still				.540
41. I worry a lot of the time				.474
164. People tell me that I am too noisy				.343
75. People say bad things to me				.337
99. I feel dizzy				.317
81. I feel like my life is getting worse and worse				.263
135. Other people find things wrong with me				.117
111. I feel sad				.079
120. I want to do better, but I can't				.024
143. I have trouble paying attention to what I am doing				-.062
110. I worry but I don't why				-.215

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

Table 2.9.2.

Functions at Group Centroids for BASC-2 Trauma Composite

	No Trauma History	Trauma History	Centroid Cutoff
Female Offenders *(N = 129)*	-.729	.718	-.006

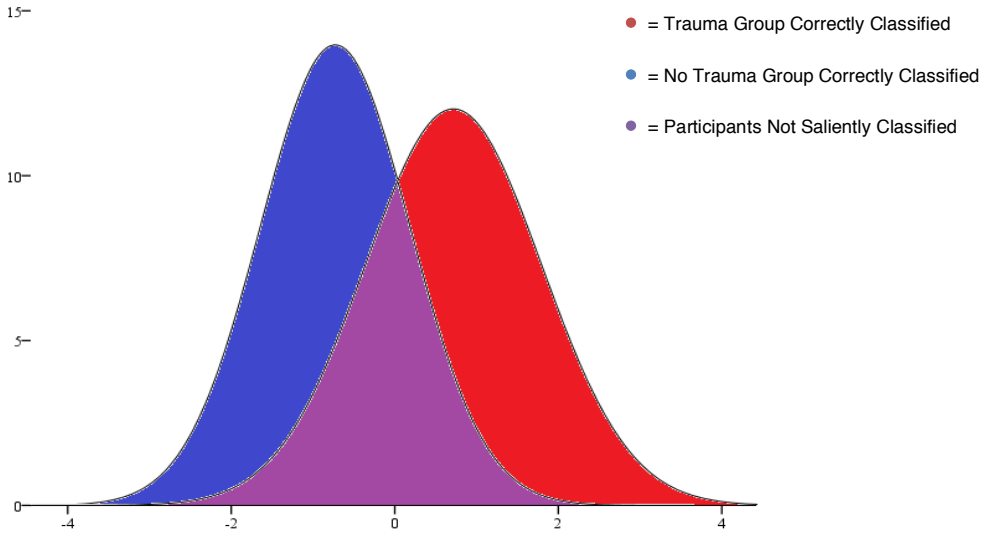


Figure 2.6.1. *Canonical Group Distribution for Trauma Composite*

Table 2.9.3.

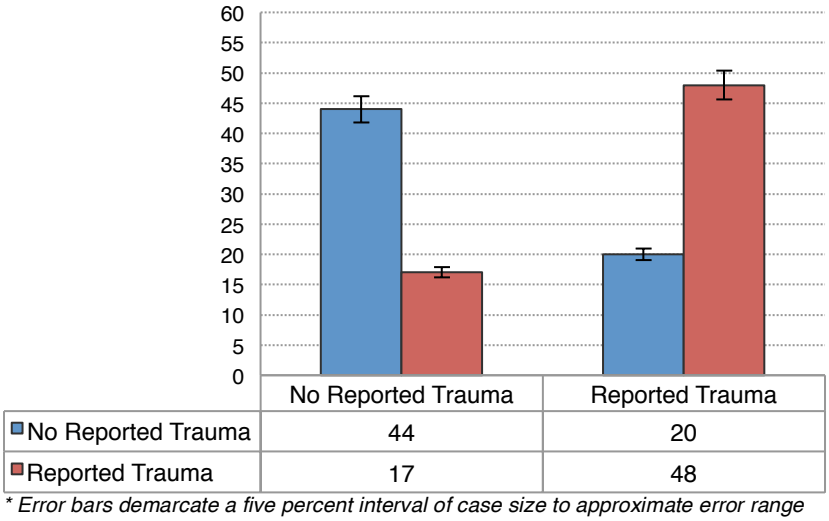
Structure Matrix of Trauma Composite Function for Discriminating Groups

Females (N = 129)	*Subscale of Origin*	*Loading*
154. People tell me to be still	Hyperactivity	.556
41. I worry a lot of the time	Anxiety	.485
110. I worry but I don't why	Anxiety	.454
75. People say bad things to me	Social Stress	.430
135. Other people find things wrong with me	Social Stress	.418
111. I feel sad	Depression	.404
120. I want to do better, but I can't	Sense of Inadequacy	.403
164. People tell me that I am too noisy	Hyperactivity	.399
81. I feel like my life is getting worse and worse	Depression	.378
99. I feel dizzy	Somatization	.367
143. I have trouble paying attention to what I am doing	Attention Problems	.334

Table 2.9.4.

Cross-Validated Discriminant Function of BASC-2 Trauma Composite

	Predicted		
Cross-Validated (N = 129)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	44	20	68.8%
Reported Trauma	17	48	73.8%
Overall Percentage			71.3%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.6.2. *Cross-Validated Trauma Composite Function Assigning Group Membership*

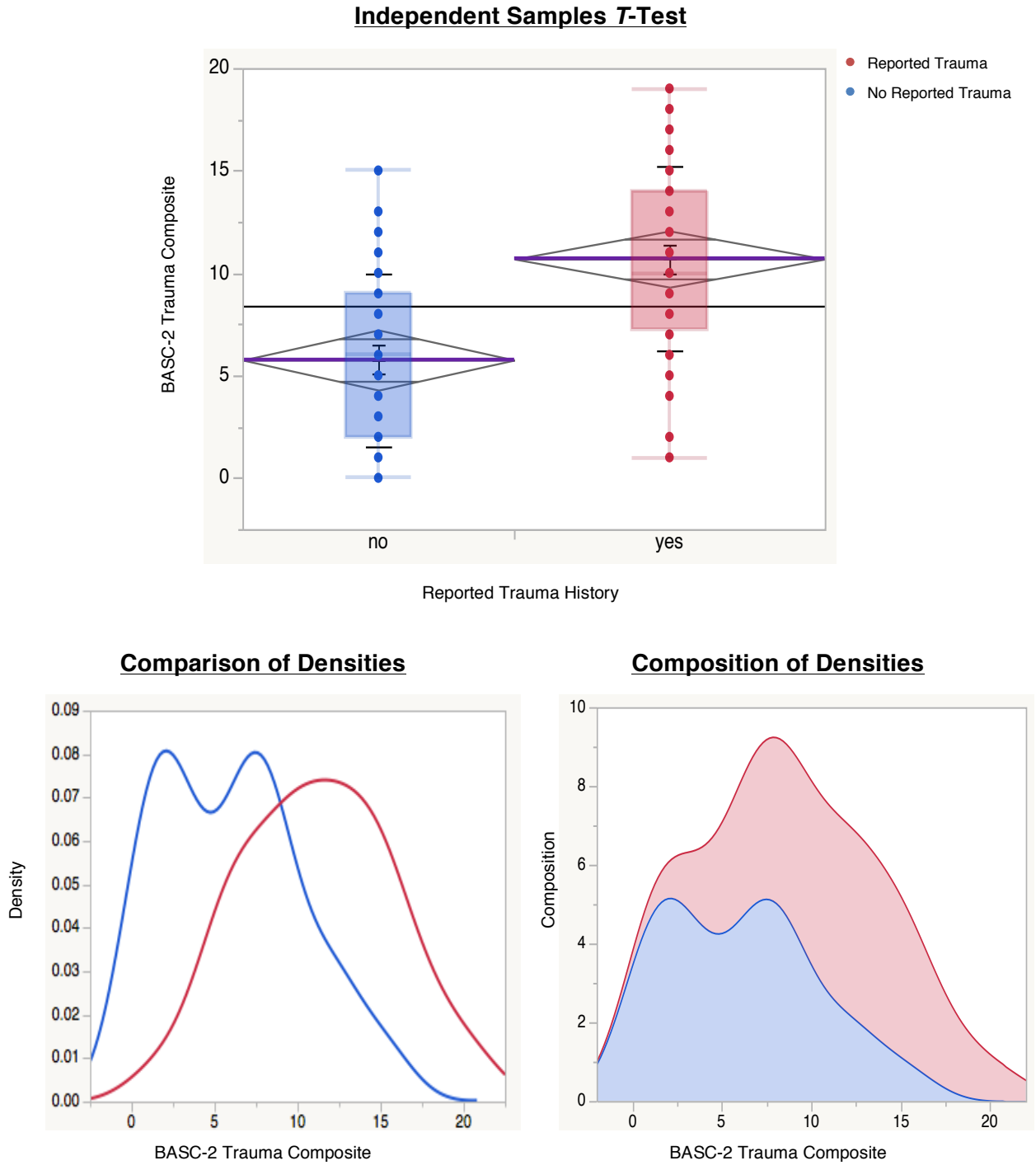


Figure 2.7. *BASC-2 Trauma Composite Mean Difference and Density Plots*

Table 2.10.1.

Descriptive Statistics and Reliability of Trauma Composite

Sample	*M*	*SD*	Skew.	Kurtosis	Cronbach's Alpha	Spearman -Brown	Guttman Split-Half
Combined (129)	8.62	5.11	.213	-.653	.76	.78	.77
Trauma (65)	11.17	4.59	.040	-.516	.65	.73	.73
No Trauma (64)	6.03	4.26	.408	-.669	.72	.68	.73

Table 2.10.2.

Item Reliability of the Trauma Composite by Total Sample and Group

	Alpha Coefficients		
	Total Sample	Trauma	No Trauma
"People tell me to be still"	.76	.66	.74
"I worry a lot of the time"	.75	.64	.71
"People tell me that I am too noisy"	.71	.58	.65
"People say bad things to me"	.76	.65	.72
"I feel dizzy"	.75	.63	.71
"I feel like my life is getting worse and worse"	.74	.65	.66
"Other people find things wrong with me"	.72	.60	.66
"I feel sad"	.76	.65	.74
"I want to do better, but I can't"	.74	.64	.68
"I have trouble paying attention to what I am doing"	.76	.66	.71
"I worry but I don't why"	.74	.60	.71

Table 2.11.

Logistic Output for Trauma Composite Predicting Group Assignment

	Reported Trauma						
BASC-2-SRP	β	*SE* β	e^{β}	Wald χ^2	R^2	Accuracy	*N*
Trauma Composite	.252	.049	1.287	26.03***	.33	72.1%	129

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

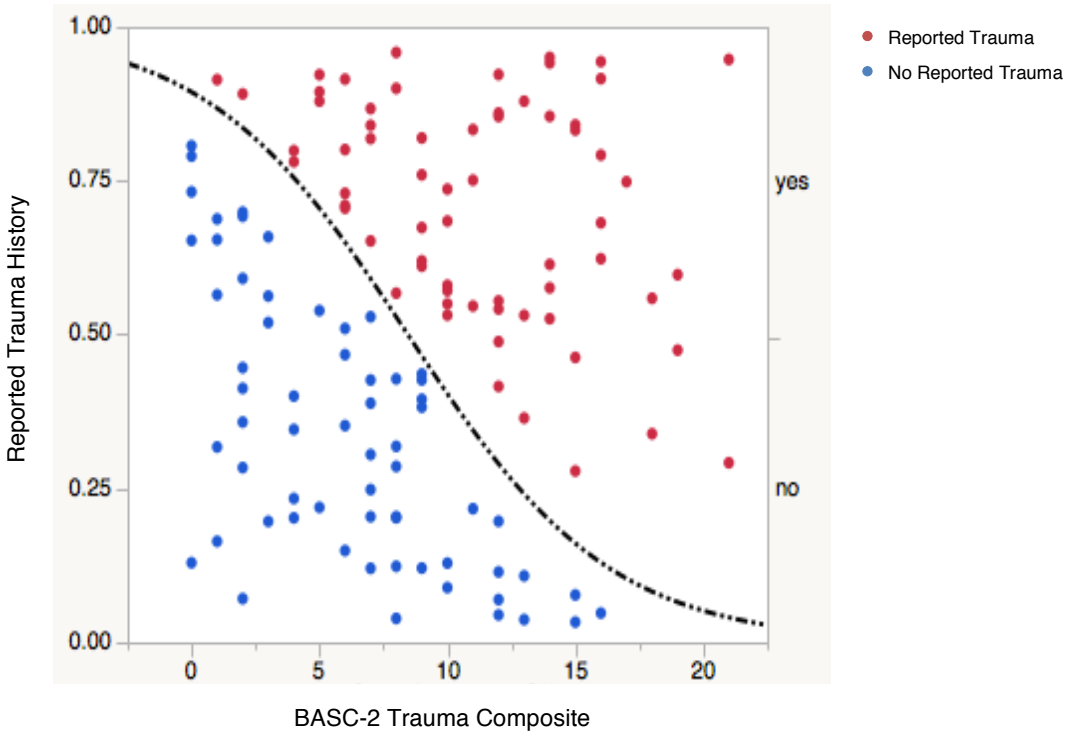


Figure 2.8. *Nominal Logistic Fit of Trauma Composite Assigning Group Membership*

Table 2.12.

ROC Curve Coordinates of Trauma Composite for Group Classification

Positive if Greater Than or Equal To*	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
.5000	1.000	.922
1.5000	.985	.844
2.5000	.969	.703
3.5000	.969	.641
4.5000	.938	.578
5.5000	.892	.547
6.5000	.815	.484
7.5000	.754	.375
8.5000	.708	.266
9.5000	.631	.188
10.5000	.538	.156
11.5000	.492	.141
12.5000	.385	.078
13.5000	.338	.047
14.5000	.246	.047
15.5000	.185	.016
16.5000	.108	.000
17.5000	.092	.000
18.5000	.062	.000
20.0000	.031	.000
22.0000	.000	.000

**The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus*

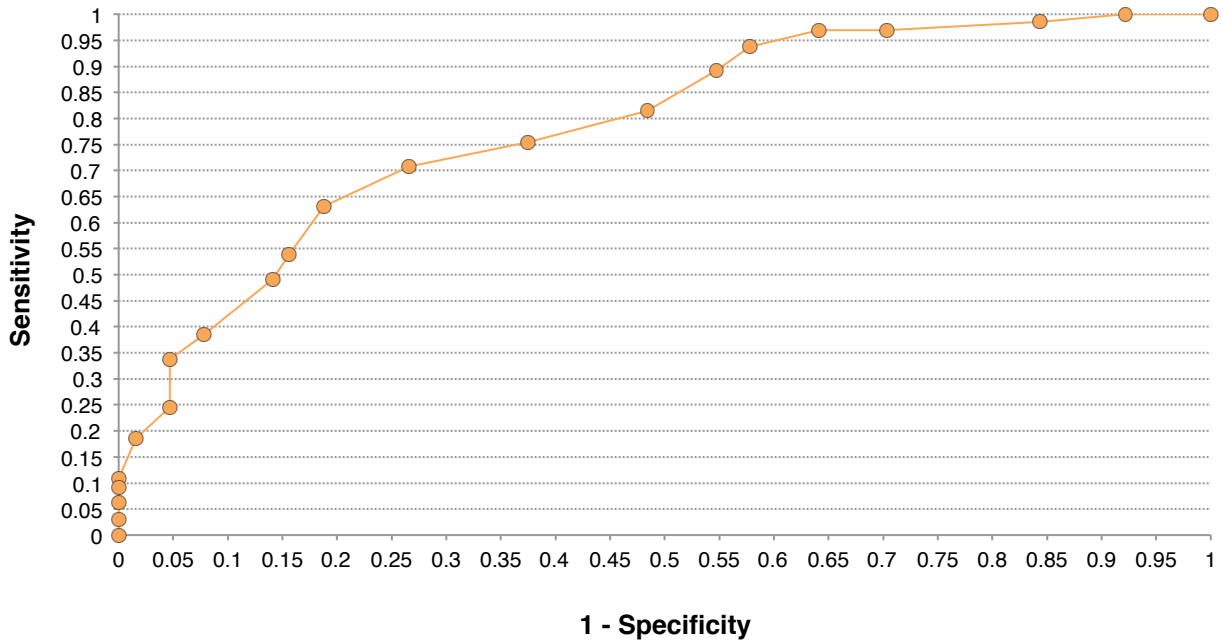


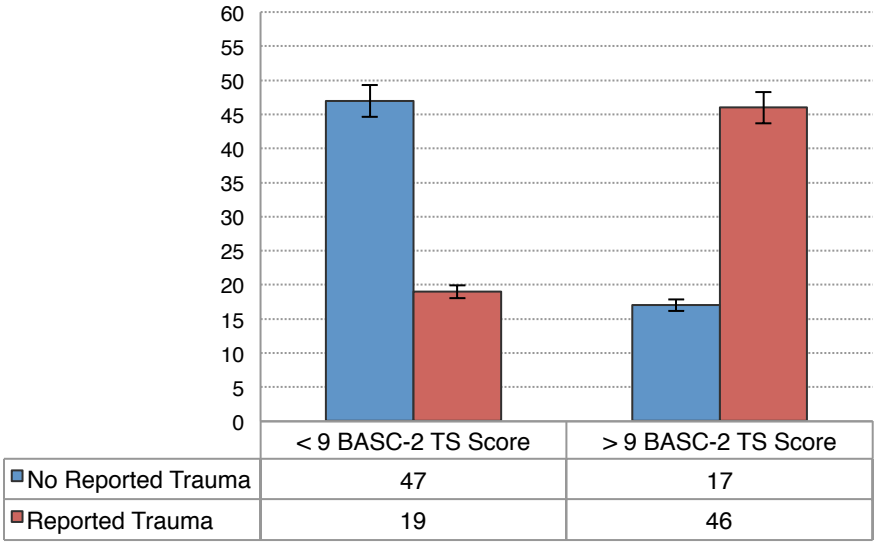
Figure 2.9. *ROC Curve of Trauma Composite for Group Classification*

Table 2.13.

Cross Tabulation of Trauma Composite for Adjudicated Females

	Cutoff Score				
Trauma History	< 9 points	≥ 9 points	χ^2	φ	*N*
No	47 (32.7)	17 (31.3)	25.22***	.44	129
Yes	19 (33.3)	46 (31.7)			

* = *p*<.05, ** = *p*<.01, *** = *p*<.001



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 2.10. *Cross Tabulation of Trauma Composite Cutoff Score for Female Offenders*

CHAPTERV

EFFICACY OF THE MMPI-A IN DETECTING TRAUMA AMONG DELINQUENT YOUTH: CROSS-VALIDATION OF THE TRAUMA SCALE FOR JUVENILE OFFENDERS (TSJO)*

*Edner, B. J., Glaser, B. A., Calhoun, G. B., Murray, H. D., Khan, Z., & Donaldson, K. (2018). Efficacy of the MMPI-A in detecting trauma among delinquent youth: Cross-validation of the Trauma Scale for Juvenile Offenders (TSJO). To be submitted to *Journal of Forensic Psychiatry and Psychology*.

Abstract

Objective: The *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992) is one of the most widely researched personality assessments in psychology. However, the diagnostic utility of the MMPI-A for detecting trauma among juvenile offenders is limited. To address this gap, Murray, Calhoun, and Glaser (2013) extracted a 17-item scale – Trauma Scale for Juvenile Offenders (TSJO). Although, more research is needed to examine the validity of this measure. ***Method:*** Retrospective data of 71 youth (73.2% male) were examined to evaluate the predictive accuracy of the MMPI-A in detecting trauma among juvenile offenders and to provide preliminary validation for the TSJO. Authors conducted cluster analyses to determine the trauma detection accuracy of MMPI-A profiles. To determine the predictive utility of individual clinical scales, mean comparisons were conducted and significant scales were retained in a predictive discriminant analysis to classify trauma. To examine the diagnostic accuracy of the TSJO, a logistic regression was conducted for the total score and cross tabulations were computed for the cutoff score. ***Results:*** Cluster analyses revealed a stable three-cluster solution. However, the solution did not statistically classify youth by trauma group. Mean comparisons by trauma group revealed differences across the Pa, Pt, Sc, and Si clinical scales. PDA output indicated statistical accuracy, but with limited clinical utility (48.8% sensitivity and 67.9% specificity). A logistic regression analysis of the TSJO indicated moderate predictive accuracy (66.2%) in identifying trauma. The TSJO cutoff demonstrated moderate to strong classification accuracy (65.9% sensitivity and 56.7% specificity). ***Conclusion:*** Overall findings provide limited support for using MMPI-A profiles and individual clinical scales in isolation when evaluating juvenile offenders for trauma. However, results provide empirical support for the TSJO as a valid and reliable measure for detecting trauma for this population.

Keywords: Trauma, Assessment, Juvenile offender, MMPI-A, TSJO, Cluster analysis

Introduction

Over the years, the *Minnesota Multiphasic Personality Inventory* (MMPI) and its successors have been arguably some of the most researched objective personality assessments in psychology (Buchanan, 1994). With respect to identifying PSTD, Keane, Malloy, and Fairbank (1984) developed the supplementary PK scale for the MMPI to detect posttraumatic stress reactions in Vietnam veterans. Research evaluating the diagnostic efficacy of the PK scale bore affirmative results (Wilson & Walker, 1990; Lyons & Wheeler-cox, 1999) revealing the scale to be a useful indicator of PTSD (Lyons & Keane, 1992).

The PK scale correctly classified 82 percent of Vietnam veterans with PTSD (Keane, Malloy, & Fairbank), with an optimal cutoff score of greater than or equal to 28 (Lyons & Wheeler-Cox, 1999). When statistically established for the MMPI-2 (Albrecht et al., 1994) and cross-validated, the PK scale correctly classified 90 percent of Vietnam combat veterans with PTSD into their originally assigned cases (Scotti, Sturges, & Lyons, 1996). However, this effect diminished when examining WWII and Korean War veterans, suggesting the PK scale might tap into more general trauma symptoms rather than combat-specific trauma (Spiro, Schnurr, & Aldwin, 1994). Providing support for this notion, Moody and Kish (1989) found that correlations between the PK scale and other MMPI scales suggest that the PK scale measures general psychological maladjustment and dysphoria rather than a specified syndromal presentation.

The content of the PK scale items are suggestive of emotional turmoil (Graham, 2006). Such emotional turmoil is characterized by anxiety, worry, sleep disturbance, depression, guilt, intrusive thoughts, lack of emotional control, and feeling misunderstood and/or mistreated by others (Graham, 2006). Research indicates that when separated from source information, the PK scale provides comparable diagnostic utility in identifying PTSD symptomology (Scotti, Sturges, & Lyons, 1996; Herman, Weathers, Litz, & Keane, 1996). Further, research suggests

that both MMPI-2 profile analysis and the PK scale are useful tools for the detection of malingering and feigning trauma-related symptomology (*see* Arbisi, Ben-Porath, & McNulty, 2006; Greiffenstein et al., 2004; Elhia, Gold, Sellers, & Dorfman, 2001; Lees-Haley, 1992). Yet, despite the several lines of research examining the diagnostic efficacy of using the MMPI-2 and the MMPI-2-RF for detecting trauma symptoms (*see* Sellbom et al., 2012; Morrell & Rubin, 2001; Follette, et al., 1997; Engels, Moisan, & Harris, 1994), few if any attempts at constructing a specific trauma or PTSD scale for the MMPI-A have been made (Scott, Knoth, Beltran-Quiones, & Gomez, 2003).

Research has shown varying degrees of effectiveness for the MMPI-A (Butcher et al., 1992) in detecting trauma-related symptoms in youth populations (Hillary & Schare, 1993). An early study by Low (1998) explored underlying profiles of adolescent psychiatric inpatients using archival data. Results revealed some sensitivity in detecting the presence of a prior history of physical abuse, although ultimately not at a statistical level. While the MMPI-A has demonstrated some success in discriminating youth with a history of sexual abuse/assault through clinical scale elevations and profile patterns (Hillary & Schare, 1993; Forbey, Ben-Porath, & Davis, 2000), research on examining general trauma-related symptom profiles and/or item clusters has been scarce.

With respect to working with juvenile offenders, Cashel, Ovaert, and Holliman (2000) found that the PK scale was moderately successful at discriminating adjudicated youth with and without posttraumatic stress reactions. The profile of offenders with PTSD demonstrated statistically higher scores on the Psychopathic Deviate (Pd), Paranoia (Pa), and Schizophrenia (Sc) clinical scales when compared to those without a diagnosis of PTSD. Such differences could possibly indicate moderate accuracy in classifying groups. Although there is a noticeable

lack of research in this area, Cashel, et al. (2000) also found that the MMPI-2 PK was useful in discriminating between youth diagnosed with PTSD and youth without.

Stacom (2012) found that elevations on the Hypochondriasis (Hs), Pa, Psychasthenia (Pt), Sc, Hypomania (Ma), and Pd clinical scales positively correlated with severity of PTSD symptomology. This clinical profile indicates an anxious adolescent with physical complaints and impaired concentration. The adolescent likely experiences feelings of anger and suspiciousness, is impulsive and hyperactive, and is socially isolated. Further, this adolescent may report unusual sensory experiences with the propensity to be disruptive and engage in aggressive behavior – possibly characterized by stealing, lying, truancy, and/or sexual acting-out (Stacom, 2012).

Williams (2009) attempted to study personality subgroups of juvenile offenders using the MMPI-A; particular attention was placed on differences between deprived and non-deprived youth. Here, the term deprived was defined as an offending child with a history of having suffered child abuse or neglect. While three statistically distinct clusters formed (normative/ oppositional, normative/defended, and withdrawn/detached), clustering based on deprivation was not successful. Paucity of statistical effect was most likely due to only a small number of cases qualifying as deprived (Williams, 2009). As such, more research is warranted to further delineate possible MMPI-A clusters that may serve to identify juvenile offenders with previous history of deprivation and/or trauma.

Edner, Kunemund, Glaser, and Calhoun (2017) found statistical differences on the Pa, Pt, Sc, and Ma clinical scales between adjudicated youth with and without reported trauma histories. This pattern of clinical scale elevations remained consistent in a follow-up study examining the personality profiles of adjudicated youth with prior trauma (Edner, Glaser, Calhoun, & Connelly, 2018). Together, research indicates that the MMPI-A may serve as a

useful measure for identifying traumatic experiences/reactions in juvenile offenders by examining patterns of clinical scale elevations (Edner et al., 2018; Edner et al., 2017; Stacom, 2012; Cashel, Ovaert, & Holliman, 2000). More research evaluating the predictive utility of such clinical scale elevations is necessary.

While research examining MMPI-A item clusters to establish trauma-specific measures is negligible, some attempts have been made. Murray, Glaser, and Calhoun (2013) examined the MMPI-A in order to identify specific items to optimally discriminate between juvenile offenders with and without a reported trauma history. Murray et al. (2013) identified 17 items that demonstrated relatively good utility for predicting group membership – authors will refer to this supplementary 17-item scale as the Trauma Scale for Juvenile Offenders (TSJO). Results revealed a classification accuracy of 70 percent for discriminating adjudicated youth with and without previous trauma exposure. The TSJO demonstrated a sensitivity of 77.1 percent and specificity of 70.6 percent (Murray, Glaser, & Calhoun, 2013).

The content of the 17-items describe an adolescent characterized by feelings of anger, alienation, family problems, anxiety, and depression expressed through somatic and physical complaints; this item profile is consistent with trauma-related stress reactions (Murray, Glaser, & Calhoun, 2013; Wamser-Nanney, & Vandenberg, 2013). However, this scale requires further development and psychometric examination. Research cross validating the efficacy of the TSJO in detecting trauma symptoms within this population is warranted.

Study aims. This study seeks to examine the predictive utility of the MMPI-A for detecting previous trauma exposure among adjudicated youth. First, this study examines the classification accuracy of MMPI-A clinical scale profile clusters followed by examination of the predictive utility of individual clinical scales. Next, this study cross-validates the TSJO by examining the scale's predictive utility for detecting trauma among this sample of juvenile

offenders. Finally, this study compares the contribution of each level of analysis (i.e. utilization of the clinical scale profiles vs. individual clinical scales vs. TSJO) in detecting the presence or absence of previous trauma exposure(s) among this population.

Method

Participants

Participants in this study were gathered from retrospective data and consisted of a sample of adjudicated youth who were referred for clinical services by the Department of Juvenile Justice (DJJ). As part of the protocol to initiate clinical services, doctoral and masters level graduate students collected information both in the community and detention settings. Youth offense types included crimes against person, crimes against property, drug charges, and status offenses, respectively.

Participants in this study (N = 71) were predominately male; 73.2 percent male (N = 52) and 26.8 percent female (N = 19). The self-identified racial breakdown consisted of a majority of African-American participants (N = 43; 60.6%). Remaining sample demographics consisted of 21 White participants (29.6%), four Latinx participants (5.6%), and three participants who identified as Multiracial (4.2%). Age of participants ranged from 13 to 18 years with a mean age of 15.27 (SD = 1.01). Refer to Tables 3.1.1 and 3.1.2 and Figures 3.1.1 and 3.1.2 for demographic characteristics.

Instruments

The *Minnesota Multiphasic Personality Inventory–Adolescent* (MMPI-A; Butcher et al., 1992) is the most broadly utilized and researched adolescent self-report measure of personality functioning (Handel et al., 2011; Baum, Archer, & Forbey, 2009). The MMPI-A is a structured self-report questionnaire that provides a comprehensive evaluation of personality functioning and psychopathology in adolescents (Butcher et al., 1992). Among forensic psychologists

working with adolescents within the juvenile justice system, the MMPI-A has been identified as one of the most frequently employed personality measures (Archer, Buffington-Vollum, Stredny, & Handel, 2006).

The MMPI-A includes 478 true/false questions and has demonstrated acceptable test–retest reliability and internal consistency, comparable with the MMPI-2 (Butcher et al., 1992). The MMPI-A has demonstrated solid construct validity (Peña, Megargee, & Brody, 1996; Glaser, Calhoun, & Petrocelli, 2002) and concurrent validity when working with juvenile offender populations (Toyer & Weed, 1998; Peña, Megaree, & Brody, 1996). Further, research has demonstrated discriminant validity between both delinquent and non-delinquent populations (Archer, Bolinskey, Morton, & Farris, 2003; Morton, Farris, & Brenowitz, 2002; Cashel, Rogers, Sewell, & Holliman, 1998), as well as acceptable convergent validity with juvenile offender samples (Handel et al., 2011). Refer to Table 3.2 for MMPI-A clinical scale descriptions.

Procedure

All participants in this study were mandated by the state of Georgia to receive psychological evaluation and/or counseling services following adjudication. Caregivers of all participants included in this study provided informed consent for participant data to be used for research purposes. Masters and doctoral level students in training completed all clinical intake interviews, clinical case notes, and doctoral level students completed all psychological evaluations. The Internal Review Board (IRB) at the University of Georgia approved all procedures for this study.

Demographic information and forensic history was gathered through clinical interviews, court referral information, and Juvenile Tracking System (JTS) data. Participants were included in the current study if 1) they completed a valid MMPI-A during the clinical intake or interview and 2) if information concerning the presence or absence of previous trauma exposure(s) was

provided during the course of a clinical intake, psychological evaluation, and/or during the course of psychotherapy.

Participant exclusion criteria was informed by MMPI-A interpretation guidelines (Archer, 2005) as well as by a review of methods commonly utilized in other MMPI-A studies (Morton & Farris, 2002; Cashel, Ovaert, & Hollima, 2000; Williams, Ben-Porath, & Hevern, 1994). Participants that met the following criteria were excluded from the study: MMPI-A scores of Cannot Say (CS) scale > 10 and *T*-score elevations on scales *L* (lying) > 70, *K* (defensiveness) > 80, *F* (infrequency) > 90, TRIN (true response inconsistency) > 80, and VRIN (variable response inconsistency) > 80.

This study defined trauma as the emotional response to events that threaten injury, death, and/or physical and emotional safety (American Psychiatric Association, 2013). Events resulting in traumatic stress reactions are classified as physical and/or sexual abuse; physical and/or emotional neglect; losing or separating from a loved one; witnessing violence, domestic or community; experiencing multiple trauma types; or experiencing single event traumas informed by JTS data. Aforementioned trauma types have been informed by the literature and used in previous research (*see* Edner, Glaser, & Calhoun, 2017).

Data indicated that 40 (56.3%) participants were reported to have experienced at least one previous trauma; 31 (43.7%) participants did not report a previous trauma history. Within the sample, the majority endorsed having experienced multiple trauma types (15; 37.5%). Remaining youth experienced only one type of trauma. Specifically, nine youth presented with history of physical abuse (22.5%), seven youth presented with history of sexual abuse/assault (17.9%), one youth presented with history of neglect (2.5%), two youth had abruptly experienced the loss of a loved one (5.0%), five youth presented with history of domestic violence (12.5%), and one youth experienced a singular trauma reported by JTS data (2.5%).

Data Analysis

This study utilized Statistical Package for the Social Sciences (SPSS), JMP Statistical Software, and Microsoft Excel for data storage, statistical analyses, and data visualization. Prior to analysis, data were screened for univariate outliers. Z-scores exceeding 3.2 standard deviations above group means were excluded from analyses to reduce the probability of both Type I and Type II errors and improve accuracy of estimates (Osborne. 2001). After removal of univariate outliers, data were screened for multivariate outliers using Mahalanobis distances; no outliers were detected ($p > .001$ for all observations). Refer to Table 3.3.1 – 3.3.2 and Figure 3.2.1 – 3.2.2 for descriptive statistic and clinical profiles for the MMPI-A clinical scales.

MMPI-A Clustering Using K-means Iterative Partitioning

In order to examine the relation of personality profiles to previous trauma exposure, authors employed a three-stage clustering procedure adapted from McDermott (1998). K-means iterative partitioning was used as the primary clustering method due to limited sample size and pre-determined range of clusters based on a priori group classification (i.e. groups with and without a reported history of trauma) (Johnson & Wichern, 2007). In stage one, K-means iterative partitioning was developed to determine viable cluster solutions. In stage two, authors employed Ward's hierarchical agglomerative linkage using squared Euclidian distance to validate the K-means cluster solutions. In stage three, Bergman et al.'s (2003, p. 99) equation ($EV = 100 \times (Et - Ec) / Et$)* evaluated the homogeneity of scores within MMPI-A clusters.

Results

In stage one of clustering, K-means partitioning was used to develop a range of solutions consisting of two, three, and four clusters. Partitioning was discontinued after computing a four-

* EV = Percentage of total error sum of squares explained by the classification; Ec = Sum of all squared deviations from the centroid divided by the number of variables and aggregated across subjects; Et = Total error sum of squares for the whole sample.

cluster solution due to limited sample size (i.e. clusters contained less than five participants). Classification assignment frequencies across cluster solutions are as follows: Two-cluster solution (cluster one, $N = 47$; two, $N = 24$), three-cluster solution (cluster one, $N = 14$; two, $N = 18$; three, $N = 39$), and four-cluster solution (cluster one, $N = 22$; two, $N = 8$; three, $N = 11$; four, $N = 30$)*. In stage two, Ward's agglomeration scheduling validated all three-cluster solutions via high percentage overlap between K-means and Ward's cluster assignments: two-cluster solution (91.5%), three-cluster solution (93%), and four-cluster solution (84.5%). Refer to Figures 3.3.1 and 3.3.2 for case/cluster frequency diagram by trauma classification and Dendrogram for Ward's linkage method.

Due to a higher percentage overlap between K-means and Ward's cluster assignments using a two and three-cluster solution, the four-cluster solution was dropped from the analysis. In stage three, application of Bergman et al.'s (2003, p. 99) equation revealed that the percentage of variance explained by cluster assignment within the two-cluster solution failed to reach the recommended cutoff of 67 percent: Cluster one ($EV = 43.9\%$) and cluster two ($EV = 56.1\%$). The two-cluster solution was dropped from the analysis. As a result, the three-cluster solution was accepted**.

ANOVA with Bonferroni Post Hoc Comparisons of Three-Cluster Solution

A one-way analysis of variance (ANOVA) was conducted with Bonferroni post hoc mean comparisons to further examine the effect of cluster assignment on MMPI-A profile differences. Computed Levene's statistics indicated appropriate homogeneity of variance across MMPI-A clinical scales with the exception of Pd ($F = 3.79$, $p = .028$), Pt ($F = 9.29$, $p < .001$), and Sc ($F = 11.93$, $p < .001$). A Brown-Forsythe F statistic was used to correct for heterogeneity of scales.

*Scatterplots of Matrices of K-Means Clusters by group can be found in Appendix D
**Appendix C for MMPI-A profiles of K-means two and four-cluster solutions

Results

The omnibus *F* test revealed statistical differences across all MMPI-A clinical scales. On the Hs scale, $F(2, 71) = 40.32$, $p < .001$ ($\eta^2 = .52$), youth in cluster two ($M = 64.72$, $SD = 7.95$) endorsed statistically higher elevations than cluster one ($M = 51.86$, $SD = 5.53$) and cluster three ($M = 47$, $SD = 7.34$), with cluster one endorsing higher elevations than cluster three. On the Depression (D) scale, $F(2, 71) = 32.91$, $p < .001$ ($\eta^2 = .50$), youth in cluster two ($M = 69.50$, $SD = 8.64$) endorsed statistically higher elevations than cluster one ($M = 55.79$, $SD = 5.48$) and cluster three ($M = 53.41$, $SD = 6.58$). On the Hysteria (Hy) scale, $F(2, 71) = 41.52$, $p < .001$ ($\eta^2 = .55$), youth in cluster two ($M = 64.56$, $SD = 7.66$) endorsed statistically higher elevations than cluster one ($M = 41.43$, $SD = 7.42$) and cluster three ($M = 48.87$, $SD = 7.66$), with cluster three endorsing higher elevations than cluster one.

On the Pd scale, $F(2, 71) = 21.37$, $p < .001$ ($\eta^2 = .40$), youth in cluster two ($M = 71.28$, $SD = 12.75$) endorsed statistically higher elevations than cluster one ($M = 56.86$, $SD = 5.39$) and cluster three ($M = 54.15$, $SD = 7.91$). On the Masculinity/Feminity (Mf) scale, $F(2, 71) = 10.91$, $p < .001$ ($\eta^2 = .29$), youth in both clusters one ($M = 54.07$, $SD = 14.74$) and two ($M = 56.61$, $SD = 12.53$) endorsed higher elevations than youth in cluster three ($M = 41.18^{bc}$, $SD = 9.81$). On the Pa scale, $F(2, 71) = 22.29$, $p < .001$ ($\eta^2 = .43$), youth in clusters one ($M = 56.93$, $SD = 8.94$) and two ($M = 63.89$, $SD = 9.67$) endorsed higher elevations than youth in cluster three ($M = 47.38$, $SD = 7.60$). On the Pt scale, $F(2, 71) = 51.24$, $p < .001$ ($\eta^2 = .65$), youth in cluster two ($M = 64.83$, $SD = 10.91$) endorsed higher elevations than youth in both clusters one ($M = 57.93$, $SD = 6.31$) and three ($M = 42.56$, $SD = 5.50$), with youth in cluster one scoring higher than those in cluster three.

On the Sc scale, $F(2, 71) = 56.74$, $p < .001$ ($\eta^2 = .68$), youth in cluster two ($M = 65.22$, $SD = 9.53$) endorsed higher elevations than youth in both clusters one ($M = 56.86$, $SD = 6.27$)

and three (M = 43.59, SD = 4.79), with youth in cluster one scoring higher than those in cluster three. On the Ma scale, $F(2, 71) = 13.39$, $p < .001$ ($\eta^2 = .31$), youth in cluster one (M = 62.86, SD = 9.40) endorsed higher elevations than youth in both clusters two (M = 54.22, SD = 10.00) and three (M = 48.08, SD = 7.80), with youth in cluster two scoring higher than those in cluster three. Finally, on the Social Introversion (Si) scale, $F(2, 71) = 22.10$, $p < .001$ ($\eta^2 = .36$), youth in clusters one (M = 55.14, SD = 5.57) and two (M = 58.17, SD = 8.05) endorsed higher elevations than youth in cluster three (M = 45.51, SD = 8.43). Refer to Table 3.4 for ANOVA and post hoc statistics and Figures 3.4.1 – 3.4.3 for the MMPI-A profiles of the three-cluster solution and graphic depiction of effect sizes.

Cross Tabulation of MMPI-A Three-Cluster Solution

To determine how well the K-means cluster profiles correlated with experiencing previous trauma among adjudicated youth, chi-square tests of independence were performed based on cluster assignment and presence or absence of previous trauma history – tests were performed with 95 percent confidence.

Results

While approaching statistical significance, the three-cluster solution did not classify adjudicated youth with reported trauma history with statistical accuracy, χ^2 (2, 71) = 3.72, p = .156. However, a medium effect size was indicated (φ = .23). The magnitude of effect suggests that statistical significance might not have been met due to a smaller sample size rather than the absence of an effect. However, anecdotal evidence supporting the efficacy of cluster profiles one and two detecting trauma was observed. Refer to Table 3.5 for results of the chi-square test of independence and Figure 3.5 for the graphic depiction of the three-cluster classification of trauma.

Mean Comparisons for MMPI-A Clinical Scales

To determine unique clinical scale contributions to detecting trauma, mean differences for the MMPI-A clinical scales and TSJO were examined using independent samples *T*-tests for youth with and without a reported trauma history. Refer to Table 3.3.1 – 3.3.2 and Figure 3.2.1 – 3.2.2 for descriptive statistic and clinical profiles for the MMPI-A clinical scales.

Results

The TSJO was found to be statistically significant, $t(69) = -3.83$, $p < .001$, with a large effect size ($d = 0.94$). In addition, results revealed statistical differences among MMPI-A clinical scales. Specifically, statistical differences were detected among the Pa, $t(69) = -2.87$, $p = .005$ ($d = 0.69$), and Pt clinical scales, $t(69) = -2.83$, $p = .006$ ($d = 0.68$), both of which demonstrated medium to large effect sizes, respectively. Further, the Sc, $t(69) = -2.96$, $p = .004$ ($d = 0.71$), and Si clinical scales, $t(69) = -2.36$, $p = .021$ ($d = 0.56$), were statistically significant at the alpha = .05 level. All aforementioned scales were retained for inclusion in the predicative discriminant model. In contrast, the Hs, D, Hy, Pd, Mf, and Ma scales did not statistically differ at the alpha = .05 level. As a result, these clinical scales were excluded from the predictive model. Refer to Table 3.6 for *T*-test results, Figures 3.6.1 and 3.6.2 for MMPI-A clinical scale profiles and effect sizes, and Figure 3.6.1 – 3.7 for the TSJO mean difference.

Predictive Discriminant Analysis for Identified MMPI-A Clinical Scales

Due to significant mean differences between adjudicated youth with and without reported trauma histories, the Pa, Pt, Sc, and Si clinical scales were included in the predictive model. In order to identify the selected MMPI-A clinical scales that most contributed to accurate classification, a predictive discriminant analysis (PDA) was conducted using a leave-one-out cross-validation (LOOCV). Box's M test showed relative equality of covariance matrices ($p > .001$), indicating limited distortion of alpha levels (Tabachnick & Fidell, 2007).

Results revealed a discriminant function that statistically classified juvenile offenders with a reported history of trauma, $\lambda = .863$, $\chi^2(4, 71) = 9.85$, $p = .048$; a small to medium effect size was indicated (canonical $r^2 = .37$). When subjected to cross-validation, the discriminant function derived from the MMPI-A clinical scales revealed a negative predictive value of 71 percent with a specificity of 67.9 percent, with a positive predictive value of only 52.5 percent. Together, results revealed that the overall probability that an adjudicated youth will be correctly classified is 60.9 percent, indicating minimal clinical utility for identifying and discriminating adjudicated youth with and without a reported history of trauma. Refer to Tables 3.7.1 – 3.7.4 and Figures 3.8.1 – 3.8.2 for PDA diagnostics.*

Reliability of TSJO

A reliability analysis was conducted to evaluate the psychometric stability of the TSJO measure. The TSJO demonstrated adequate internal consistency with respect to intraclass correlation (Cronbach's alpha = .67), measure length (Spearman-Brown = .63), and split-half reliability (Guttman Split-Half = .59). When split by both gender and group classification, TSJO reliability remained consistent, respectively. Together, findings reveal the TSJO items to demonstrate adequate statistical efficacy, providing psychometric support for the use of the TSJO in detecting trauma symptomology in juvenile offenders. Refer to Table 3.9.1 – 3.9.5 for TSJO descriptive statistics and reliability coefficients for total sample and by group and gender.

Logistic Regression for TSJO

To determine the predictive accuracy of the TSJO total score, a logistic regression analysis was conducted with 95 percent confidence. Analysis also estimated the odds of trauma having been reported based upon change in TSJO total score. To evaluate goodness of fit of the model, Hosmer and Lemeshow tests were performed; results indicated no conflict with

*Scatterplots of Matrices by group can be found in Appendix D

model assumptions of fit ($p > .05$). In addition, to identify outliers, analogs of Cook's influence statistics were computed; all Cook's distances fell below 0.5.

Results

The use of the TSJO total score statistically predicted whether or not youth presented with a previous trauma history with 66.2 percent accuracy, Wald χ^2 (1, 71) = 10.83, $p < .001$. The odds ratio of 1.407 indicates that adjudicated youth were 1.407 items more likely to have a reported trauma history for every one-point increase in TSJO total score. Further, results revealed a medium effect size (Nagelkerke $R^2 = .28$). This indicates that approximately 28 percent of the variance of reporting a trauma history among the sample is explained by item endorsement on the TSJO, respectively. Refer to Table 3.10 for summary of logistic regression and Figure 3.9 for nominal fit of logistic classification.

Cross Tabulation of TSJO Cutoff

To examine the predictive utility of the TSJO five-point cutoff score proposed by Murray, Calhoun, and Glaser (2013), cross tabulations using chi-square tests of independence were performed; tests were performed with 95 percent confidence.

Results

Use of the TSJO cutoff score to classify reported trauma history among adjudicated youth was statistically significant, χ^2 (1, 71) = 5.39, $p = .020$; a medium effect size was indicated ($\varphi = .28$). In sum, results reveal the TSJO cutoff score correctly classified reported trauma histories among adjudicated youth with a medium magnitude of relation. Refer to Table 3.11 for results of cross tabulations and Figure 3.10 for the graphic depiction of the TSJO cutoff.

With respect to diagnostic efficacy statistics (Streiner, 2003), the TSJO cutoff yielded 14 false positives and 13 false negatives with a sensitivity of 65.9 percent and specificity of 56.7

percent. Authors computed likelihood ratios in order to calculate the odds of the TSJO accurately classifying juvenile offenders. Results indicated a positive likelihood ratio (LR^+) of 1.52. This indicates that adjudicated youth that exceed a score of greater than or equal to five (out of a 17 points) are 1.52 times more likely to report previous trauma. In contrast, results indicate a negative likelihood ratio (LR^-) of 1.66. This negative likelihood ratio indicates that adjudicated youth that endorse fewer than five points are 1.66 times more likely to *not* report previous trauma. Further results indicated a positive predictive value of 67.5 percent and a negative predictive value of 54.8 percent. These values indicated that the probability that an adjudicated youth has experienced previous trauma when the test is positive is 67.5 percent, while the probability of no trauma is 54.8 percent when the test is negative.

Discussion

For the first aim of the study, authors examined the predictive accuracy of MMPI-A clinical scale profile clusters to identify previous trauma exposure among delinquent youth. Results indicated a stable three-cluster solution revealing three distinct clinical scale profiles with statistical mean differences between clusters; large effect sizes were indicated. While not statistically classifying youth with prior trauma histories, a medium effect size was indicated. The magnitude of effect suggests that statistical accuracy may have been detected with a larger sample.

Participants in cluster one endorsed mild elevation on the Ma scale ($T = 62.9$) with lower scores on the Hy scale ($T = 41.4$). Adjudicated youth with this profile typically present with elevated egocentrism, self-centeredness, and self-indulgent actions (Archer & Krishnamurthy, 2002). These youth may express a preference for action rather than thought and reflection; tend to exhibit restlessness, distractibility, and impulsiveness; and have limited social involvement. Others may characterize these youth as unfriendly, tough-minded, and with a realistic

orientation (Archer & Krishnamurthy, 2002). Such tough-minded or callous presentations are consistent with adaptive responses to trauma among juvenile offenders (Bennett & Kerig, 2014). While results cannot statistically confirm the relation between adjudicated youth with cluster one personality and reported trauma history, anecdotal evidence was observed. Specifically, 71.4 percent of youth in cluster one presented with previous trauma histories; this is an improvement over the 56.4 percent by chance.

Participants in cluster two endorsed numerous elevations. Specifically, youth assigned to cluster two endorsed clinically elevated scores on the Pd (T = 71.3), D (T = 69.5), and Sc scales (T = 65.2), with mild elevations on the Hs (T = 64.7), Pa (T = 63.9), and Pt scales (T = 64.8). Cluster two youth are best understood within the framework of a 4–2/2–4 code-type (Archer, 2005). Adjudicated youth with this code-type are typically characterized by exhibiting impulse control difficulties and socially inappropriate behaviors (Archer & Krishnamurthy, 2002). For adjudicated youth with a 4–2/2–4 code-type, their propensity for acting out and displacing or externalizing behavior appear to operate as their primary defense mechanisms. These youth can be described as depressed, angry, rebellious, and exhibiting problems with authority. Such behaviors often lead to legal problems, including histories of arrests and convictions with high risk of developing substance abuse disorders (Archer & Krishnamurthy, 2002).

In addition, youth with cluster-two personality may exhibit withdrawn and reclusive behavior, feelings of inferiority, distrust and suspiciousness of interpersonal relationships, and a pattern of overreaction to stress that can develop into physical symptoms (Archer & Krishnamurthy, 2002). The pattern of behavior – characterized by externalization, affective disturbance, paranoia, and anxious distress – is consistent with complex trauma presentations (Ford et al., 2010; Ford et al., 2012). Similar to youth assigned to cluster one, some anecdotal evidence was observed regarding the relation between cluster-two personality and previous

trauma exposure. Specifically, 67 percent of youth in cluster two presented with previous trauma history, an improvement over the 56.1 percent by chance. However, due to limited sample size, additional research is needed to verify these trends.

Scores of participants in cluster three fell within normal limits with no overt indications of psychopathology (Archer, 2005). Youth in cluster three demonstrated generally normative personality profiles with lower scores on the Mf scale ($T = 41.2$). These youth may present with stereotypic or extreme masculine emphasis and demonstrate a relatively narrow range of interests defined by traditional masculine stereotypes (Archer & Krishnamurthy, 2002). Results indicate that 46.2 percent of youth assigned to cluster three reported a previous trauma history – this is slightly lower than the 56.4 percent rate expected by chance. Although statistically stable, the three-cluster solution does not appear optimal for detecting trauma history in adjudicated youth. It is possible that with a large sample, a four or five-cluster solution could further partition the data, possibly increasing the accuracy of trauma group classification.

For the second aim of the study, the predictive utility of individual MMPI-A clinical scales was examined for detecting trauma. Findings indicate that juvenile offenders with previous trauma exposure(s) endorsed statistically higher scores with medium effect sizes on the Pa, Pt, Sc, and Si clinical scales compared to their counterparts. This pattern of elevations suggests that, adjudicated youth with trauma exhibit more interpersonal sensitivity, suspiciousness in interpersonal relationships, and tendencies to be argumentative (Archer & Krishnamurthy, 2002) when compared to their counterparts. Such youth may experience more tension, anxiety, feelings of inadequacy, inferiority, and insecurity, with a propensity to be withdrawn, vulnerable, and socially introverted (Archer & Krishnamurthy, 2002).

Such behavioral and interpersonal patterns are generally consistent with previous research concerning the adaptive strategies employed by juvenile offenders to navigate or

respond to deleterious circumstances (Kerig, 2014; Ford et al., 2010; Ford et al., 2012). Further, this pattern of MMPI-A clinical scale elevations is consistent with previous research examining personality profiles of adjudicated youth with trauma (Edner et al., 2018; Edner et al., 2017). While medium clinical scale differences between juvenile offenders with and without trauma were found, it is unclear based on mean comparisons if these scales could function to detect trauma-related symptomology in juvenile offender populations.

Authors examined the efficacy of the selected MMPI-A clinical scales for accurately discriminating juvenile offenders with and without reported trauma histories. Findings indicated a cross-validated discriminant function derived from the Pa, Pt, Sc, and Si clinical scales that correctly classified 52.5 percent of offenders in the trauma group with a sensitivity of 48.8 percent. The discriminant function correctly classified 71 percent of offenders without a history of previous trauma exposure(s) with a specificity of 67.9 percent. In all, 60.9 percent of youth were correctly classified using the selected MMPI-A clinical scales. Together, results indicated that the selected MMPI-A clinical scales demonstrate statistical accuracy, but with limited clinical utility for identifying juvenile offenders with previous trauma exposure(s).

For the third aim of the study, authors cross-validated the TSJO by examining the scale's diagnostic efficacy for accurately classifying juvenile offenders with trauma. To examine the predictive utility of the TSJO, a logistic regression analysis was conducted. Findings indicated that the TSJO total score provided robust contribution in predicting trauma history status among juvenile offenders. Logistic analysis indicated 66.2 percent accuracy in predicting trauma, demonstrating improvement over chance rates of 56.3 percent. TSJO scores explained approximately 23 percent of accurate classification variance with an odds ratio of 1.407. This odds ratio indicates that juvenile offenders were 1.407 times more likely to have experienced previous trauma exposure(s) for every one point increase on their TSJO score.

When applying the TSJO cutoff of greater than or equal to five, results revealed a sensitivity of 65.9 percent and specificity of 56.7 percent. Findings indicate that youth with scores exceeding the cutoff were 1.52 times more likely to have experienced a previous trauma, with an estimated probability of 67.5 percent. In contrast, youth with scores less than five were 1.66 times more likely to have *not* experienced a previous trauma, with an estimated probability of 54.8 percent. Together, results indicate that the TSJO demonstrates adequate reliability and provides predictive and clinical utility for accurately classifying juvenile offenders by trauma.

The predictive accuracies of the TSJO are somewhat lower than would be predicted by prior research studying the effectiveness of trauma assessment scales with juvenile offenders. In their original study, Murray, Glaser, and Calhoun (2013) found the TSJO to yield a sensitivity of 77.1 percent and specificity of 70.6 percent; these original findings are more compelling than the 67.5 percent sensitivity and 56.7 percent specificity found in the current study. One of the reasons for this difference is likely due to having a reduced sample size. Nevertheless, findings empirically support the clinical utility of the TSJO as a valid and reliable measure that provides modest contribution to correctly classifying juvenile offenders by the presence or absence of previous trauma history.

Various limitations within this study should be noted. Youth participating in this study were court referred from a region with limited demography, which may reduce generalizability of results. Future studies should integrate more diverse samples of participants from differing demographic areas to examine possible differences with regard to age, ethnicity/race, gender, current detention status, etc. Furthermore, participant data in this study were predominantly gathered within a community mental healthcare setting. Thus, results should not necessarily be generalized to adjudicated youth currently being detained in a correctional facility.

Research indicates that personality profiles differ between male and female offenders (Aalsma & Lapsley, 2001). As a consequence, prospective research should include a sample large enough that separate analyses for male and female offenders could be conducted. Results might shed light on how personality profiles aid in the detection of previous trauma exposure(s) across both male and female offenders.

Juvenile offenders have been shown to underreport the severity of symptoms on self-report measures (Sibley et al., 2010; Newman, 2002). This pattern of underreporting is consistent for adjudicated youth when completing trauma-related instruments (Vergano, Lauriola, & Speranza, 2015). Underreporting of symptoms could potentially increase the probability of committing Type I error. In addition, research has demonstrated a robust relation between trauma-related symptomology and varying psychiatric conditions (e.g. depression, anxiety, obsessive-compulsive behaviors, among others) (Abram et al., 2007). Thus, it is possible that the items comprising the TSJO measured ancillary psychiatric symptoms in the absence of experiencing a previous trauma.

Youth offenders within the juvenile justice system tend to be unwilling or disinclined to divulge past exposure(s) to possibly stigmatizing events (Kerig, 2013). Such reticence to disclose traumatic experiences can serve as a complication in acquiring reliable self-report data (Bennett & Kerig, 2014). Juvenile offenders also develop coping strategies to help them navigate and adapt to toxic environments (Ford et al., 2006). Such strategies can manifest as emotional avoidance in the expression of juvenile delinquency (Bennett & Kerig, 2014; Ford et al., 2006). As a consequence, youth may not consider a previous trauma to be traumatic given their proclivities to avoid or suppress overwhelming emotional states as an adaptive survival mechanism (Bennett & Kerig, 2014; Ford et al., 2006). Given these constraints as they relate to

self-report data, reliance on few sources of historical data, or lack thereof, serves as a limitation. Yet, despite these limitations, significant results were found.

This study contributes to the literature by providing data on the diagnostic efficacy of the MMPI-A as a trauma measure for adjudicated youth. While MMPI-A clinical scale clusters did not statistically classify juvenile offenders, results indicate anecdotal evidence of two distinct personality profiles that may relate to trauma history classification – more research is needed to determine if these profiles exhibit statistical trends or are spurious in nature. More definitively, findings indicate that clinical scales Pa, Pt, Sc, and Si provide statistical contribution in classifying the presence or absence of reported trauma history. However, given the negligible sensitivity of the clinical scale function, use of the Pa, Pt, Sc, and Si clinical scales in isolation provides limited clinical utility for detecting trauma among this population.

Finally, this study provides empirical support and preliminary validation for the TSJO as a viable measure of trauma-related symptomology for juvenile offenders. When compared to the detection accuracy of MMPI-A clinical profile clusters and selected clinical scales, results reveal the TSJO to be a more robust indictor of trauma symptomology with more clinical utility to aid mental health practitioners. Findings suggest that the TSJO might increase the detection accuracy for identifying juvenile offenders with prior histories of trauma when evaluating this population. Still, further research is necessary to examine the validity of the TSJO in relation to other empirically validated trauma assessment instruments.

Future studies are advised to cross-validate the TSJO with an empirically validated trauma instrument with juvenile offender samples. Further validation of the TSJO will serve to establish the measure as a viable trauma symptom detection tool for juvenile offender populations. Upcoming studies should procure corroboration of past trauma histories, or lack thereof, from numerous sources to augment precision in detecting the presence or absence of

previous trauma exposures. In conclusion, while further research is essential, the overall findings of this study provide empirical support for using the TJSO to aid in accurately identifying previous trauma exposure(s) among juvenile offenders.

Tables and Figures

All data visualization in this section used consistent color-coding to represent sample derivations. However, it is important to note that cluster analyses found with body of this manuscript as well as in Appendix C and D do not necessarily follow this color key. Rather, color-coding for clusters will be located next to the graphic depiction of each cluster. For all other graphic depictions, reference this color key below.

- = No reported history of trauma
- = Reported history of trauma via procedural methods discussed in body of manuscript
- = Total sample: Combination of both trauma and non-trauma groups
- = Female gender
- = Male gender
- = Ethnicity

Table 3.1.1.

Demographic Characteristics (N = 71)	Frequency	Percentage
Gender		
Males	52	73.2%
Females	19	26.8%
Trauma History		
No Reported Trauma	31	43.7%
Reported Trauma	40	56.3%
Trauma Type		
Physical Abuse	9	22.5%
Sexual Abuse/Assault	7	17.9%
Neglect	1	2.5%
Grief and Loss	2	5.0%
Witnessed Domestic Violence	5	12.5%
Multiple Traumas	15	37.5%
Single Event Traumas	1	2.5%
Ethnicity		
African American	43	60.6%
White	21	29.6%
Latinx	4	5.6%
Multiracial	3	4.2%

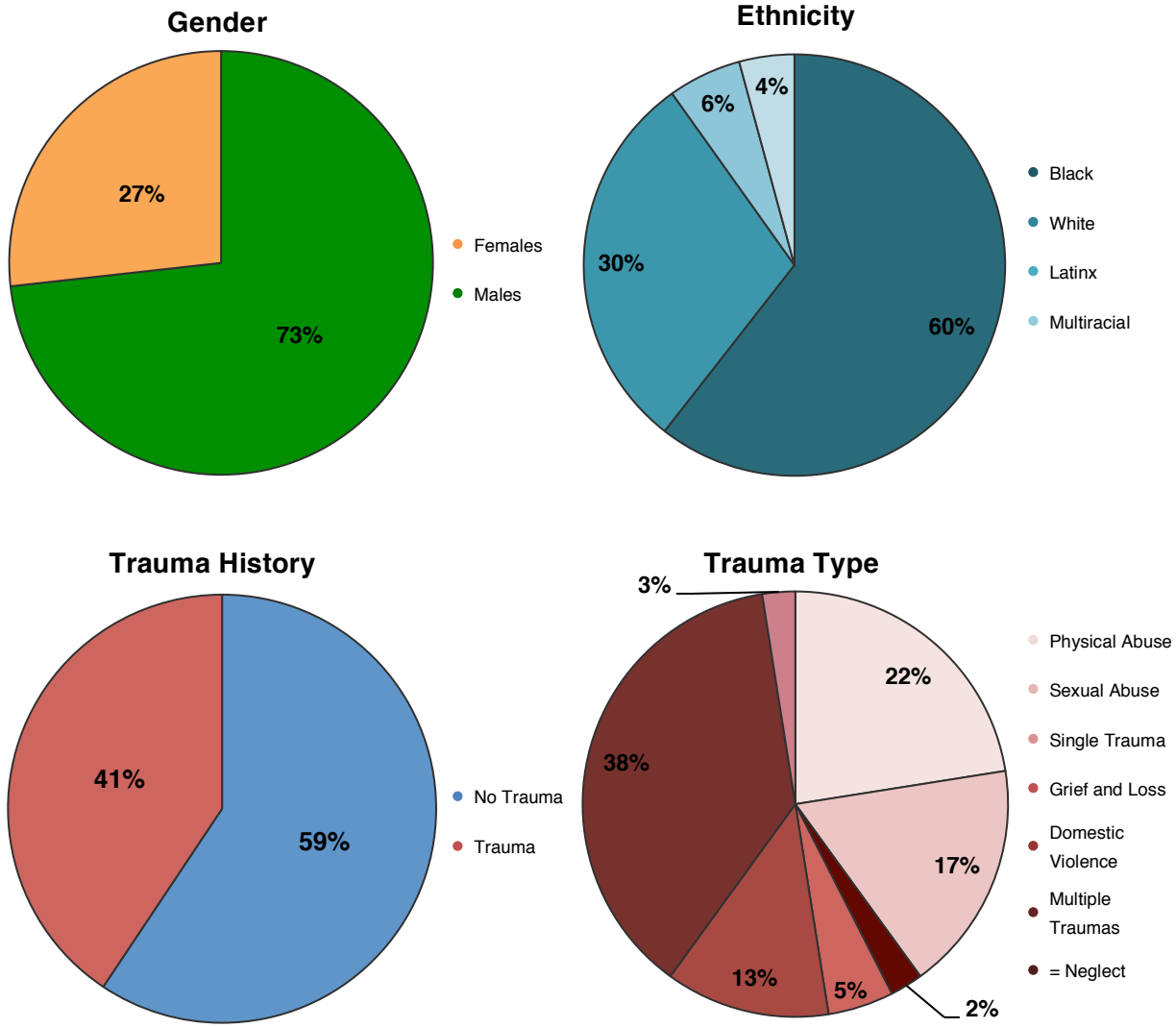


Figure 3.1.1. *Graphic Depiction of Demographic Characteristics*

Table 3.1.2.

Demographic Characteristics by Gender

	Male (*N* = 52)		Female (*N* = 19)	
	Frequency	Percentage	Frequency	Percentage
Trauma History				
No Reported Trauma	23	44.2%	8	57.9%
Reported Trauma	29	55.8%	11	42.1%
Trauma Type				
Physical Abuse	7	24.1%	2	18.2%
Sexual Abuse/Assault	4	13.8%	3	27.3%
Neglect	1	3.4%	0	0%
Grief and Loss	1	3.4%	1	9.1%
Witnessed Domestic Violence	5	17.2%	0	0%
Multiple Traumas	11	37.9%	4	36.4%
Single Event Traumas	0	0%	1	9.1%
Ethnicity				
African American	29	55.8%	14	73.6%
Anglo American	17	32.7%	4	21.1%
Latinx	4	7.7%	0	0%
Multiracial	2	3.8%	1	5.3%

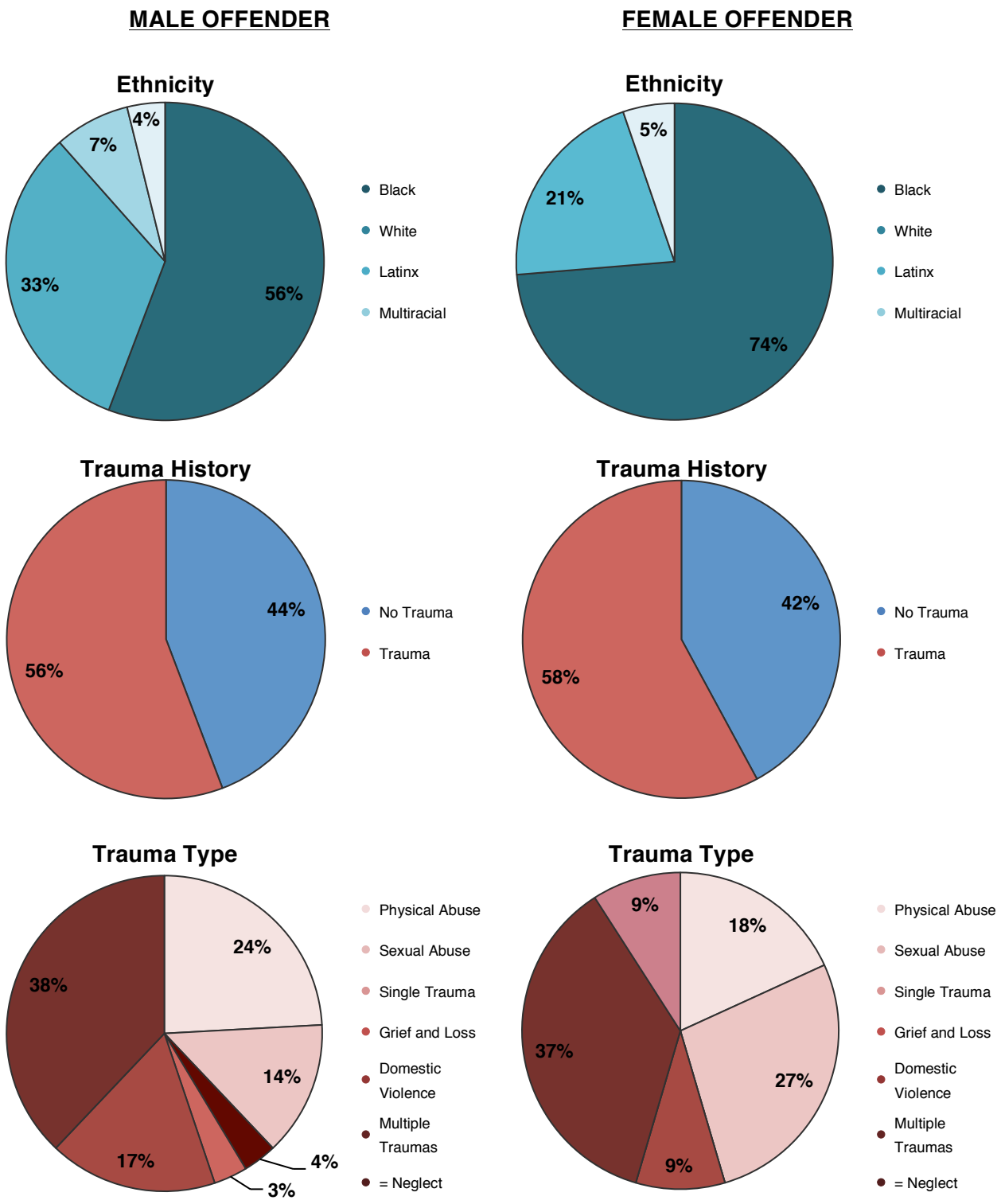


Figure 3.1.2. *Graphic Depiction of Demographic Characteristics by Gender*

Table 3.2.

Description of MMPI-A Clinical Scales

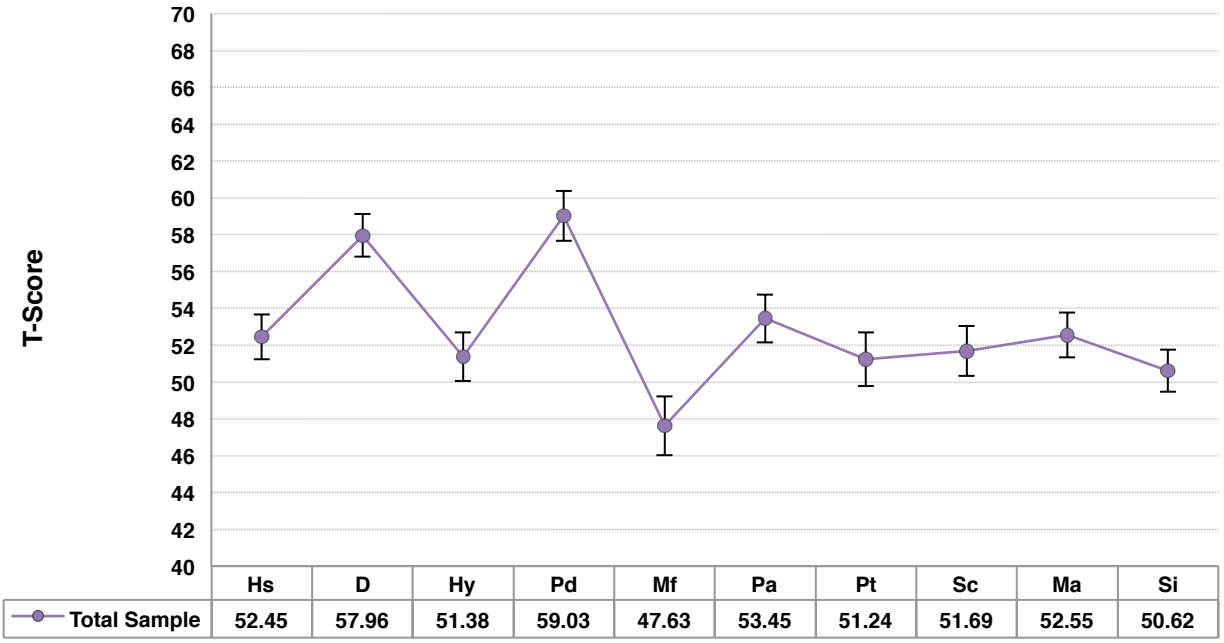
Scale	Description
Scale 1 (Hs: Hypochondriasis)	Scale 1 elevations reflect a preoccupation with health and illness. Items present a variety of physical complaints, ranging from specific to general or vague
Scale 2 (D: Depression)	Scale 2 items include content related to despondency and apathy, excessive sensitivity, and physical problems and complaints including psychomotor retardation
Scale 3 (Hy: Hysteria)	Scale 3 items cover two broad content areas that include (1) somatic concerns and the denial of problems and (2) need for social acceptance and approval
Scale 4 (Pd: Psychopathic Deviate)	Scale 4 elevations are associated with numerous behavior problems including lying, cheating, stealing, temper outbursts, and aggression
Scale 5 (Mf: Masculinity/Femininity)	Scale 5 elevations indicate endorsement of an unusual pattern of stereotypically feminine interests in boys and masculine or “macho” interests in girls
Scale 6 (Pa: Paranoia)	Scale 6 items include content related to ideas of reference, suspiciousness, feelings of persecution, rigidity, and moral self-righteousness
Scale 7 (Pt: Psychasthenia)	Scale 7 covers a wide variety of symptomology including physical complaints, unhappiness, problems concentrating, obsessive thoughts anxiety, and feelings of inferiority
Scale 8 (Sc: Schizophrenia)	Scale 8 content areas include bizarre thought processes, peculiar perceptions, social isolation, disturbances in mood and behavior, and difficulties with concentration and impulse control
Scale 9 (Ma: Hypomania)	Scale 9 content areas include grandiosity, irritability, flight of ideas, egocentricity, elevated mood, and cognitive and behavioral overactivity
Scale 0 (Si: Social Introversion)	Scale 0 items measure social relationship problems. Elevated scores are associated with social withdrawal and low self-esteem

Table 2 Excerpted from Butcher et al. (1992)

Table 3.3.1.

Descriptive Statistics for MMPI-A Clinical Scales

Total sample *(N = 71)*	*M*	*SD*	Skewness	Kurtosis
Hypochondriasis (Hs)	52.45	10.62	0.40	-0.01
Depression (D)	57.96	10.07	0.70	0.27
Hysteria (Hy)	51.38	11.37	0.38	-0.70
Psychopathic Deviate (Pd)	59.03	11.63	1.02	1.21
Masculinity/Femininity (Mf)	47.63	13.80	0.58	-0.32
Paranoia (Pa)	53.45	11.09	0.80	0.41
Psychasthenia (Pt)	51.24	12.67	0.61	-0.42
Schizophrenia (Sc)	51.69	11.68	0.72	-0.34
Hypomania (Ma)	52.55	9.97	0.78	0.88
Social Introversion (Si)	50.62	10.00	-0.13	-0.75



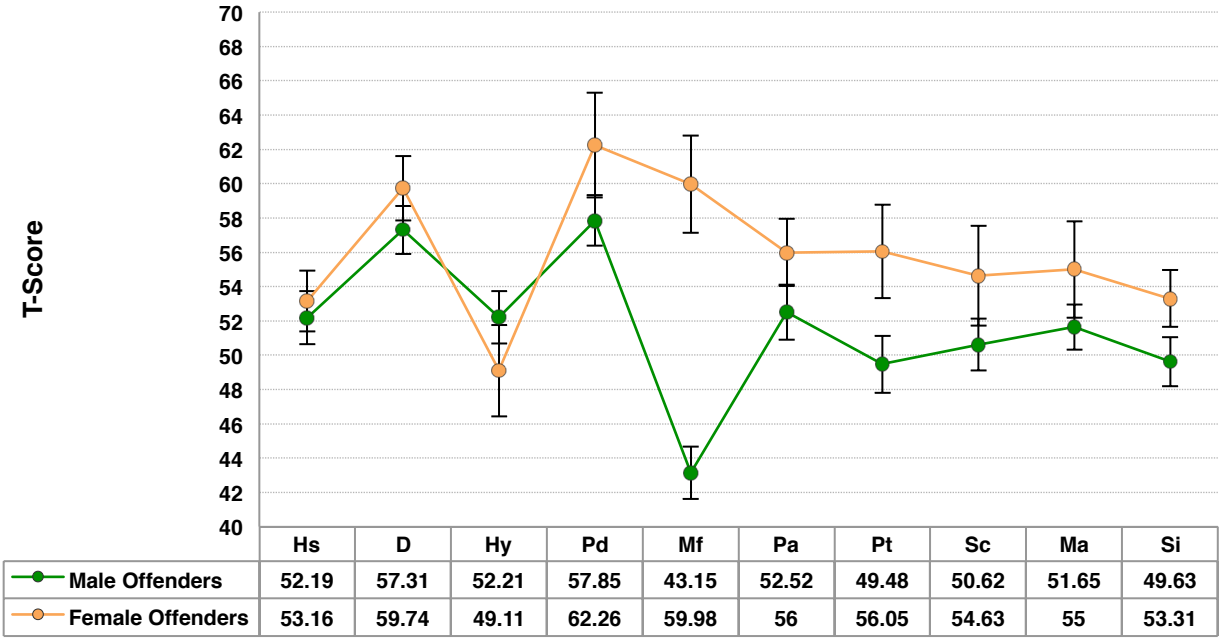
** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 3.2.1. *MMPI-A Clinical Profiles of Adjudicated Youth for Total Sample*

Table 3.3.2.

Descriptive Statistics for MMPI-A Clinical Scales by Gender

	Male Offenders *(N = 52)*				Female Offenders *(N = 19)*			
	M	*SD*	Skew.	Kurtosis	*M*	*SD*	Skew.	Kurtosis
Hypochondriasis (Hs)	52.19	11.12	0.547	0.027	53.16	7.74	0.314	0.317
Depression (D)	57.31	10.18	0.864	0.630	59.74	8.18	1.127	0.210
Hysteria (Hy)	52.21	10.96	-0.092	0.198	49.11	11.66	0.509	-0.532
Psychopathic Deviate (Pd)	57.85	10.60	1.233	1.207	62.26	13.36	0.442	-0.431
Masculinity/Femininity (Mf)	43.15	10.98	0.763	0.101	59.98	12.38	-0.182	1.134
Paranoia (Pa)	52.52	11.62	0.421	-0.542	56.00	8.61	0.994	-0.249
Psychasthenia (Pt)	49.48	12.06	0.662	0.274	56.05	11.91	0.357	-0.214
Schizophrenia (Sc)	50.62	10.89	1.206	0.970	54.63	12.65	0.260	-0.912
Hypomania (Ma)	51.65	9.52	0.584	0.027	55.00	12.25	0.406	0.129
Social Introversion (Si)	49.63	10.30	1.284	1.130	53.31	7.21	-0.867	-0.538



** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 3.2.2. *MMPI-A Clinical Profiles of Adjudicated Youth for Total Sample by Gender*

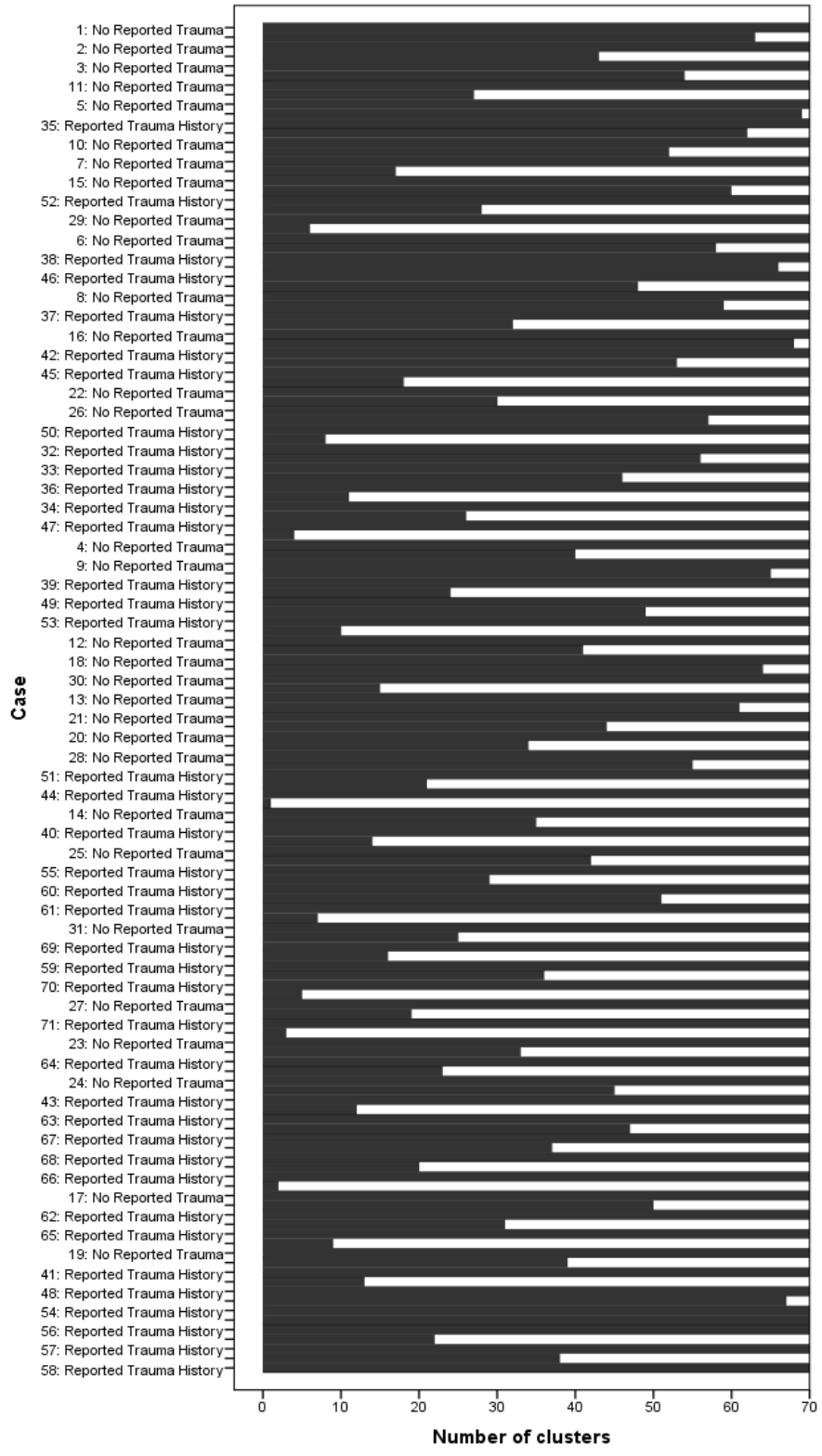


Figure 3.3.1. *Ward's Linkage Case/Cluster Frequency Diagram of MMPI-A*

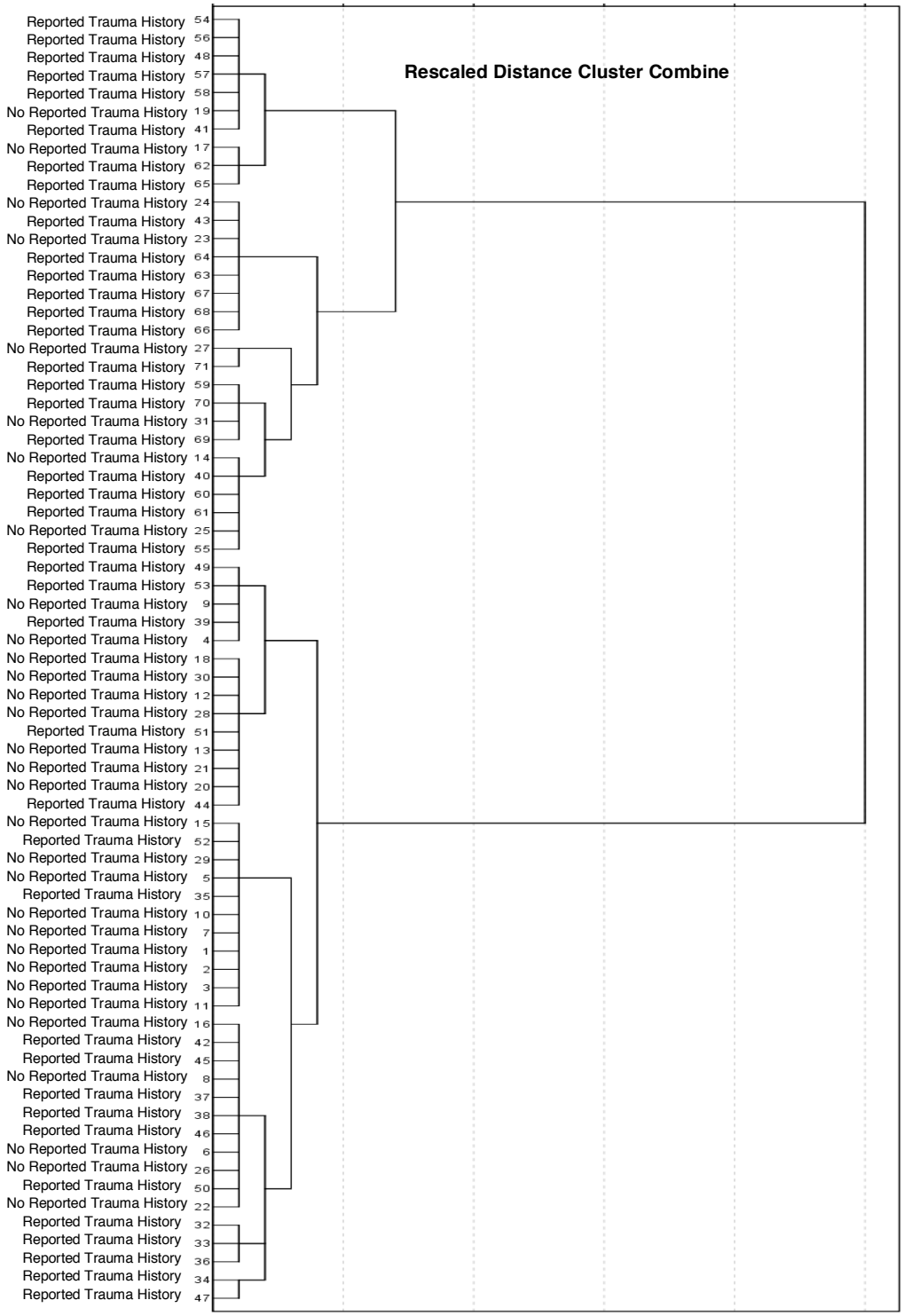


Figure 3.3.2. *Dendrogram of Hierarchical Clustering with Ward's Linkage**

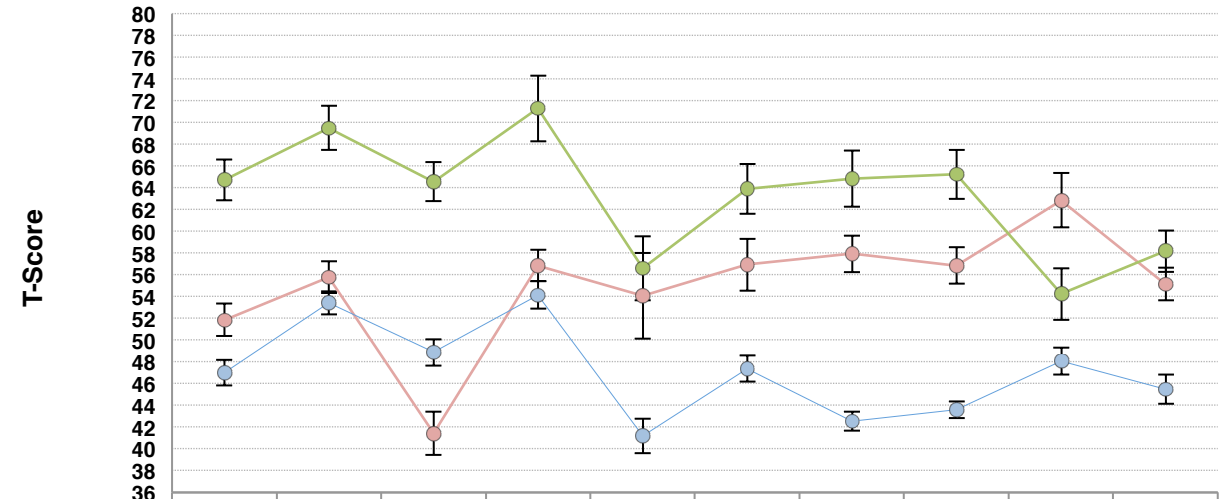
*Numbers and Group Classification correspond to individual cases within dataset

Table 3.4.

ANOVA with Bonferroni Post Hoc Mean Comparisons of MMPI-A Clusters

	K-means Three-Cluster Solution							
	Cluster One *N* = 14		Cluster Two *N* = 18		Cluster Three *N* = 39			
MMPI-A Scales	M	SD	M	SD	M	SD	*F*(2, 71)	η^2
Hypochondriasis	51.86^{a}	5.53	64.72^{ac}	7.95	47.00^{c}	7.34	40.32****	.52
Depression	55.79^{a}	5.48	69.50^{ac}	8.64	53.41^{c}	6.58	32.91****	.50
Hysteria	41.43^{ab}	7.42	64.56^{ac}	7.66	48.87^{abc}	7.66	41.52****	.55
Psychopathic Deviate	56.86^{a}	5.39	71.28^{ac}	12.75	54.15^{bc}	7.91	21.37****	.40
Masculinity/Feminity	54.07^{b}	14.74	56.61^{c}	12.53	41.18^{bc}	9.81	10.91****	.29
Paranoia	56.93^{b}	8.94	63.89^{c}	9.67	47.38^{c}	7.60	22.29****	.43
Psychasthenia	57.93^{ab}	6.31	64.83^{ac}	10.91	42.56^{abc}	5.50	51.24****	.65
Schizophrenia	56.86^{ab}	6.27	65.22^{ac}	9.53	43.59^{abc}	4.79	56.74****	.68
Hypomania	62.86^{ab}	9.40	54.22^{ac}	10.00	48.08^{abc}	7.80	13.39****	.31
Social Introversion	55.14^{b}	5.57	58.17^{c}	8.05	45.51^{bc}	8.43	22.10****	.36

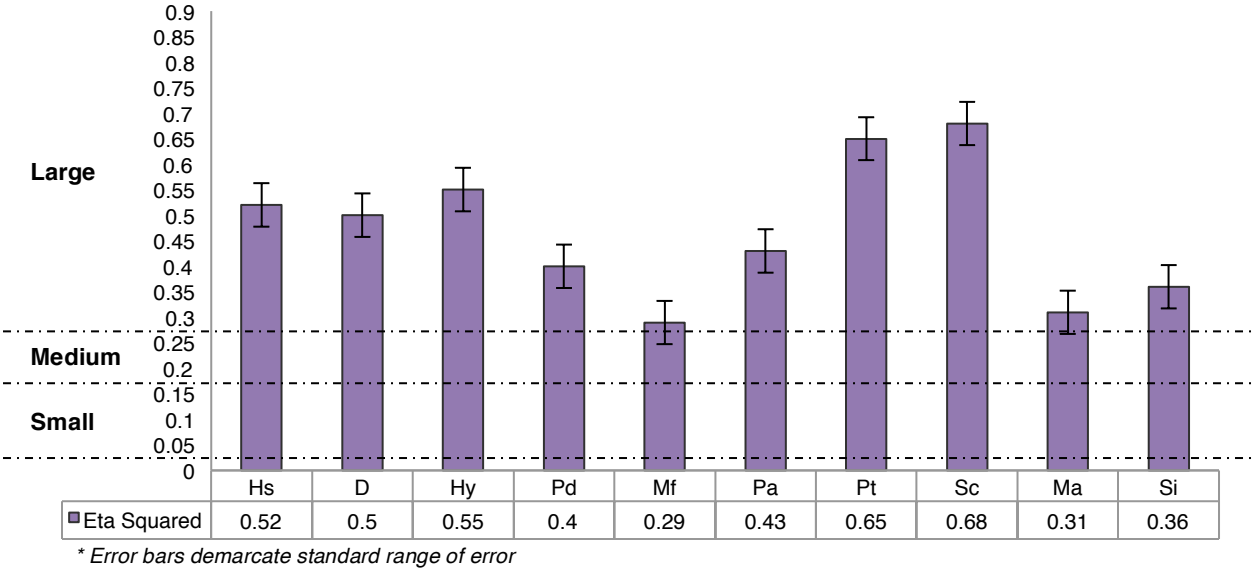
****$p < .0001$. *A cluster mean is statically different from another mean if they have different superscripts: a = statistical difference between Cluster One and Cluster Two; b = statistical difference between Cluster One and Cluster Three; c = statistical differences between Cluster Two and Cluster Three*



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Cluster 1	51.86	55.79	41.43	56.86	54.07	56.93	57.93	56.86	62.86	55.14
Cluster 2	64.72	69.5	64.56	71.28	56.61	63.89	64.83	65.22	54.22	58.17
Cluster 3	47	53.41	48.87	54.15	41.18	47.38	42.56	43.59	48.08	45.5

** Error bars demarcate standard error of measurement (SEM) for each variable.*

Figure 3.4.1. *MMPI-A Clinical Scale Profiles of Three-Cluster Solution*



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Eta Squared	0.52	0.5	0.55	0.4	0.29	0.43	0.65	0.68	0.31	0.36

** Error bars demarcate standard range of error*

Figure 3.4.2. *Magnitude of MMPI-A Clinical Scale Differences Between Groups*

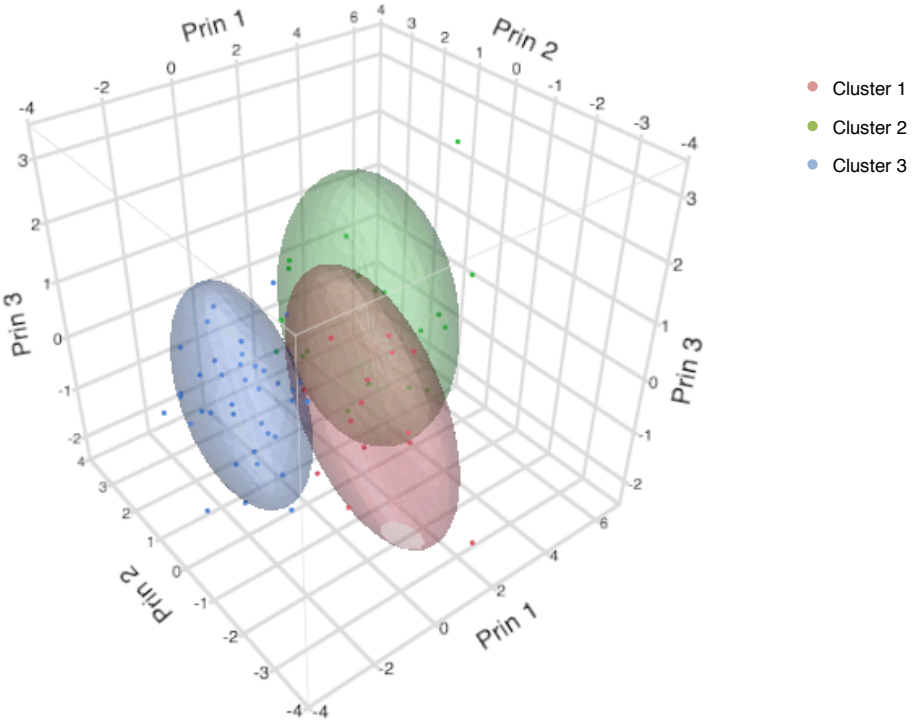


Figure 3.4.3. *Three–Dimensional Biplot of MMPI-A Clinical Scale Profiles of 3–Cluster Solution**

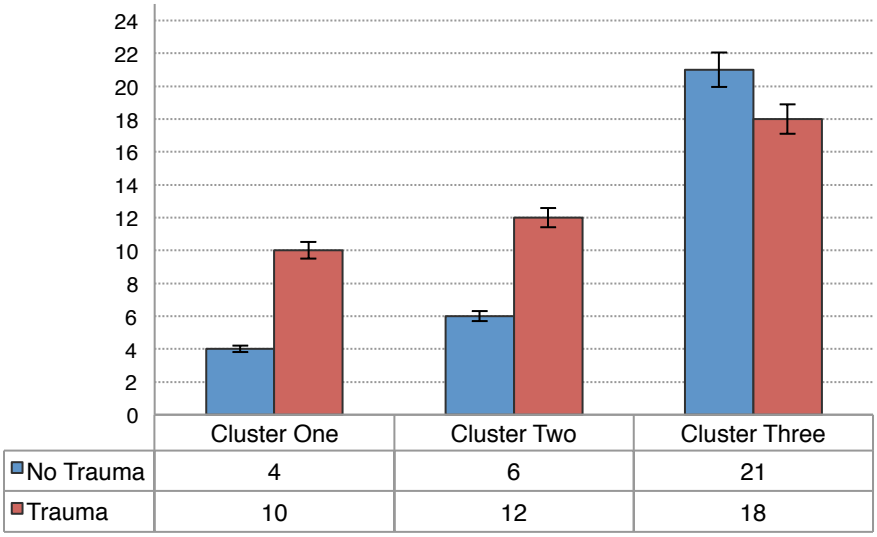
* Prin 1 = Principle Component 1
Prin 2 = Principle Component 2
Prin 3 = Principle Component 3

Table 3.5.

Cross Tabulation of K-means Three-Cluster Solution

	K-means Three-Cluster Solution					
Trauma History	Cluster One	Cluster Two	Cluster Three	χ^2	φ	*N*
No	4 (6.1)	6 (7.9)	21 (17.0)	3.721	.23	71
Yes	10 (7.9)	12 (10.1)	18 (22.0)			

* = *p*<.05, ** = *p*<.01, *** = *p*<.001



** Error bars demarcate a five percent interval of case size to approximate error range*

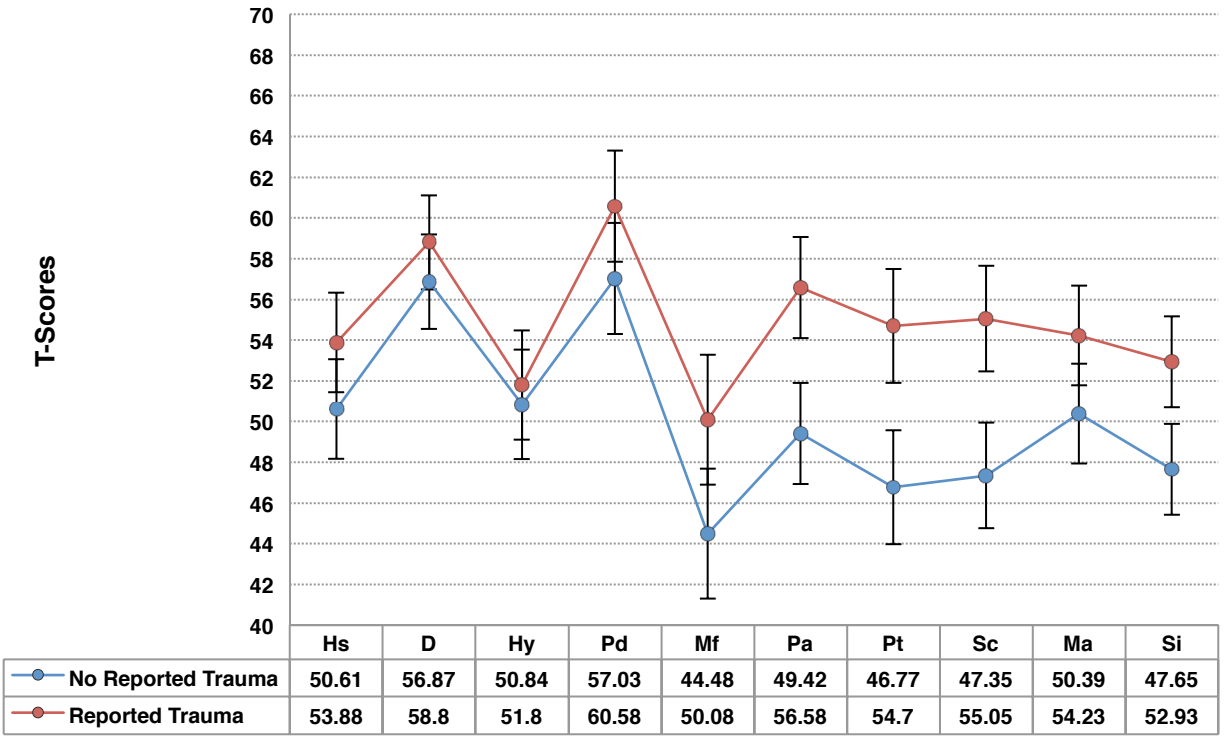
Figure 3.5. *Cluster Assignment Predicting Trauma History Among Adjudicated Youth*

Table 3.6.

Mean Comparisons of MMPI-A Clinical Scales and TSJO by Trauma Group

	No Trauma Group			Trauma Group				
MMPI-A Scales	*M*	*SD*	*N*	*M*	*SD*	*N*	*M* Diff.	*t*
TSJO	3.29	2.35	31	5.78	2.94	40	-2.48	-3.83***
Hypochondriasis	50.61	10.75	31	53.88	9.80	40	-3.26	-1.33
Depression	56.87	8.96	31	58.80	10.26	40	-1.93	-0.83
Hysteria	50.84	10.70	31	51.80	11.61	40	-0.96	-0.36
Psychopathic Deviate	57.03	11.05	31	60.58	11.69	40	-3.54	-1.30
Masculinity/Femininity	44.48	13.28	31	50.08	13.37	40	-5.59	-1.75
Paranoia	49.42	9.76	31	56.58	10.90	40	-7.16	-2.87**
Psychasthenia	46.77	11.57	31	54.70	11.84	40	-7.93	-2.83**
Schizophrenia	47.35	10.83	31	55.05	10.87	40	-7.70	-2.96**
Hypomania	50.39	11.01	31	54.23	9.59	40	-3.84	-1.57
Social Introversion	47.65	8.93	31	52.93	9.69	40	-5.28	-2.36*

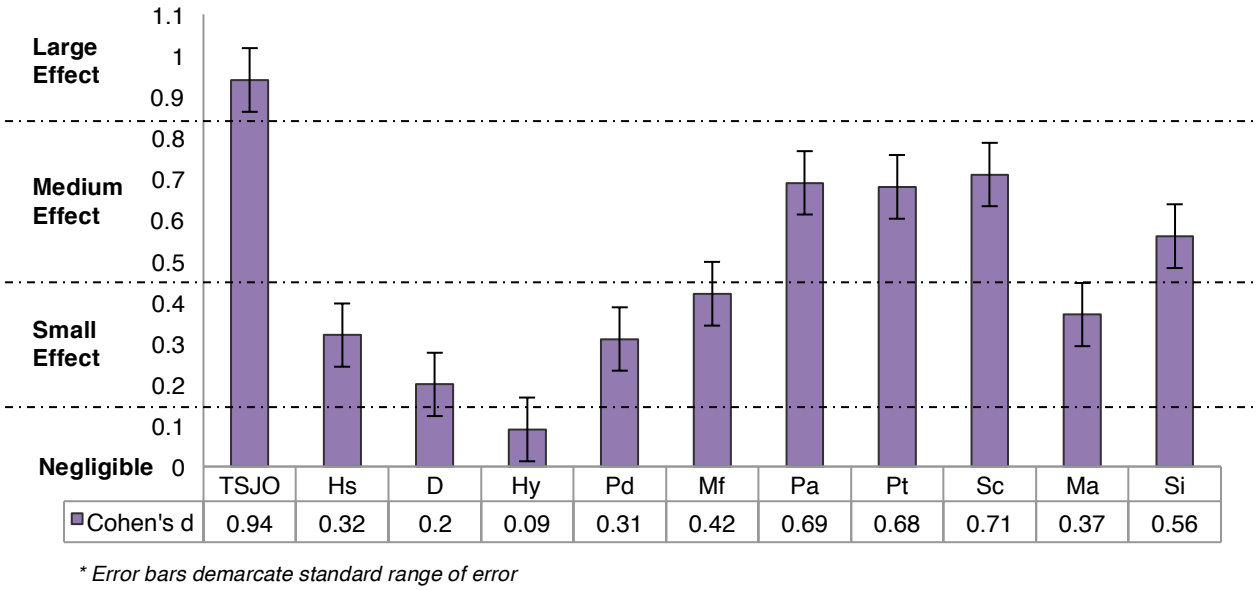
* = $p<.05$, ** = $p<.01$, *** = $p<.001$



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
No Reported Trauma	50.61	56.87	50.84	57.03	44.48	49.42	46.77	47.35	50.39	47.65
Reported Trauma	53.88	58.8	51.8	60.58	50.08	56.58	54.7	55.05	54.23	52.93

** Error bars demarcate standard error of distance for between group variables*

Figure 3.6.1. *MMPI-A Clinical Scale Profiles of Adjudicated Youth*



** Error bars demarcate standard range of error*

Figure 3.6.2. *Magnitude of MMPI-A Clinical Scale and TSJO Differences between Groups*

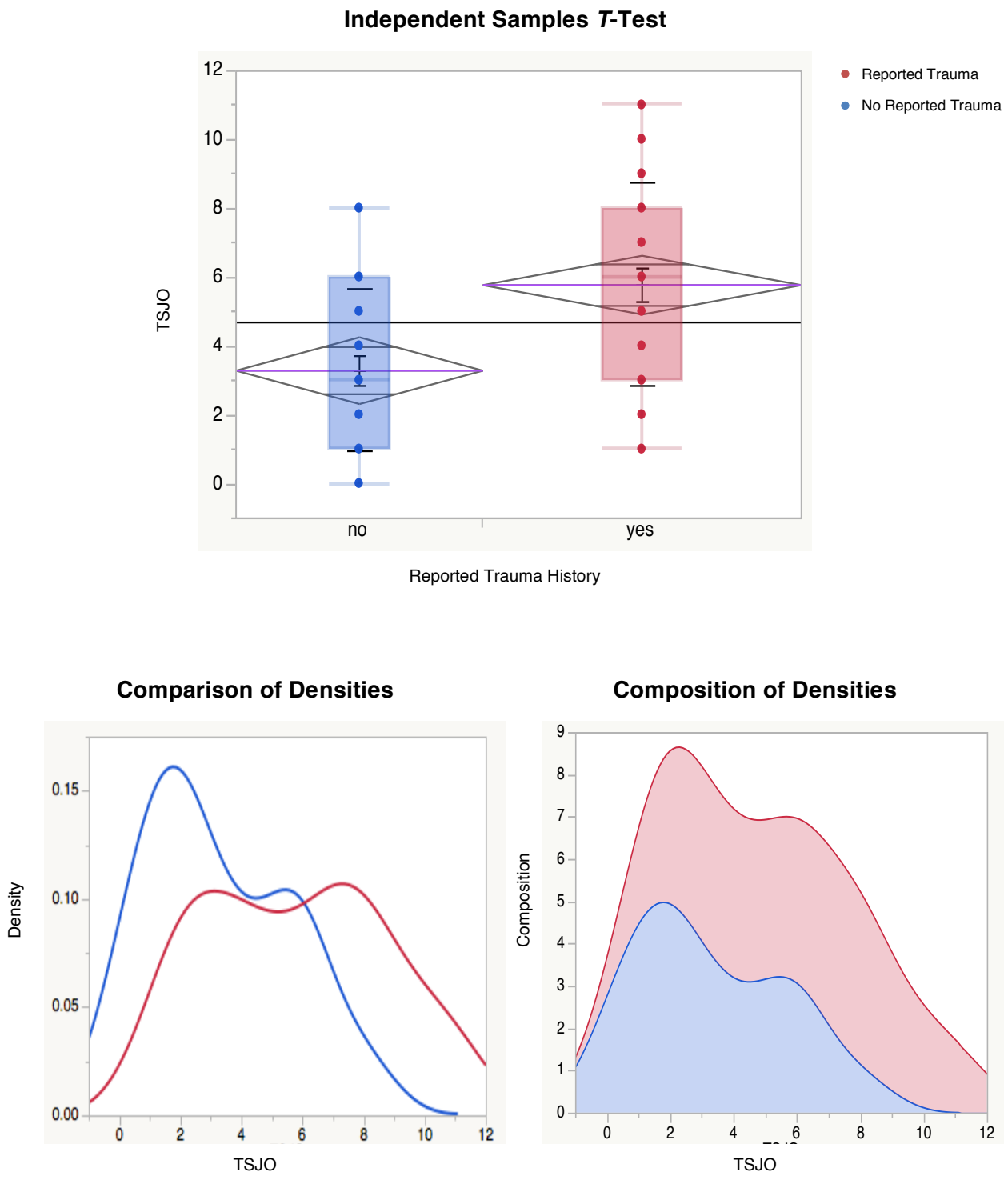


Figure 3.7. *Graphic Depiction of TSJO Mean Difference and Density Plots*

Table 3.7.1.

Canonical Function of Selected MMPI-A Scales for Discriminating Groups

Combined Gender (N = 71)	λ	Canonical r^2	χ^2	*Coefficient*
Selected MMPI-A Clinical Scales	.863	.37	9.85*	--
Paranoia (Pa)				.520
Social Introversion (Si)				.515
Schizophrenia (Sc)				.203
Psychasthenia (Pt)				-.068

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

Table 3.7.2.

Functions at Group Centroids for Selected MMPI-A Scales (N = 71)

	No Trauma History	Trauma History	Cutoff Centroid
Discriminant Function	-.446	.345	-.051

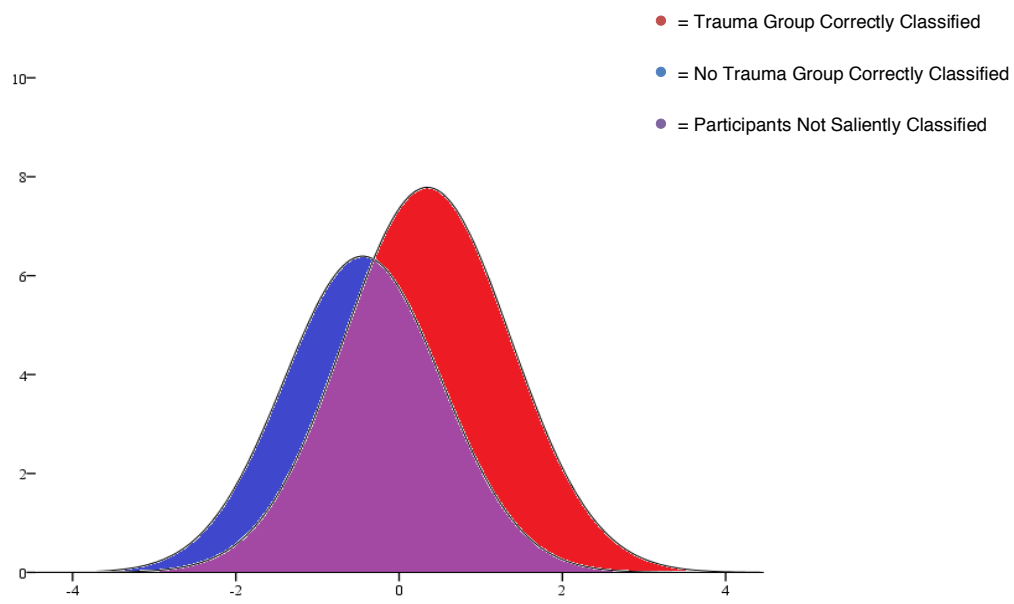


Figure 3.8.1. *Canonical Group Distribution for Selected MMPI-A Clinical Scales**

* Scatterplot Matrices by group can be found in Appendix D.

Table 3.7.3.

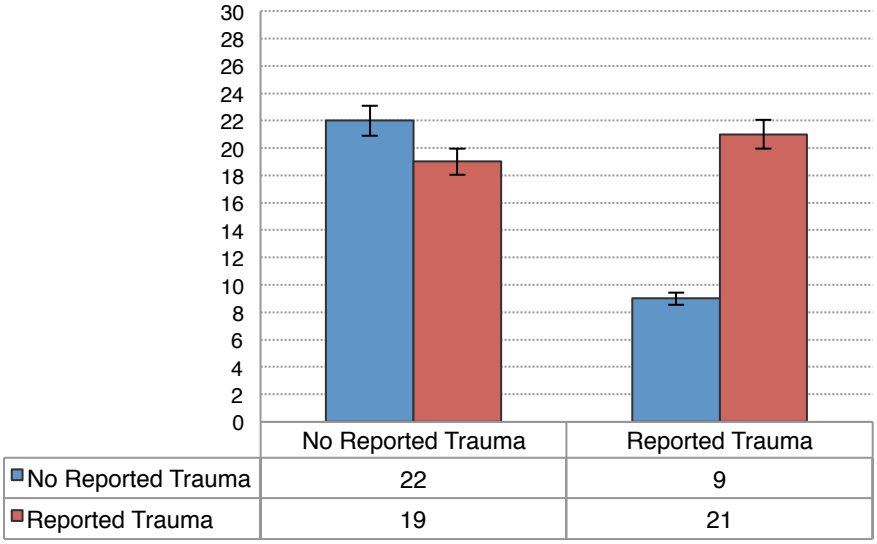
Structure Matrix of MMPI-A Scale Function for Discriminating Trauma

MMPI-A Clinical Scales	*Loading*
Schizophrenia (Sc)	.897
Paranoia (Pa)	.868
Psychasthenia (Pt)	.855
Social Introversion (Si)	.713

Table 3.7.4.

Cross-Validation MMPI-A Scale Function Group Assignment

	Predicted		
Cross-Validated (N = 71)	*No Reported Trauma*	*Reported Trauma*	*Percentage Correct*
No Reported Trauma	22	9	71.0%
Reported Trauma	19	21	52.5%
Overall Percentage			60.6%



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 3.8.2. *Cross-Validated MMPI-A Clinical Scale Function for Group Assignment*

Table 3.9.1.

Descriptive Statistics for MMPI-A Items Comprising the TSJO (N = 71)

*Items**	*M*	*SD*
2. I have a good appetite (Hs)	.15	.36
25. I am bothered by an upset stomach several times a week (Hs)	.14	.35
27. I shrink from facing a crisis or difficulty (Si)	.25	.44
34. At times I feel like smashing things (ang)	.25	.44
41. Once a week or oftener I suddenly feel hot all over, for no real reason (Hy); (Sc)	.27	.45
46. I am a very sociable person (D); (Si)	.20	.40
158. My memory seems to be alright (D); (Pt); (Sc)	.21	.41
165. I frequently notice my hand shakes when I try to do something (Hy)	.35	.48
177. I sometimes think about killing myself (dep); (MAC-R)	.15	.36
259. Even when I am with people I feel lonely much of the time (Pd); (Pt); (Sc)	.35	.48
270. I am easily embarrassed (Pt); (Si)	.35	.48
281. I feel anxiety about something or someone almost all the time (Pt)	.38	.49
296. I have strange and peculiar thoughts (Pt); (Sc)	.41	.50
302. The things that some of my family have done have frightened me (Sc)	.25	.44
369. I feel unable to tell anyone all about myself (aln); (trt); (A)	.42	.50
388. I am often sorry because I am so irritable and grouchy (ang)	.44	.50
443. I have missed a lot of school in my life because of sickness (hea); (sch)	.10	.30

**Item containing scales are listed after each item. Items were garnered from Clinical, Content, and Supplemental scales. Clinical Scales: D = Depression; Hs=Hysteria; Hy=Hypochondriasis; Pd=Psychopathic Deviate; Pt = Psychasthenia; Sc=Schizophrenia; and Si=Social Introversion. Content Scales: aln=Alienation; ang=Anger; dep=Depression; hea=Health Concerns; sch=School Problems; and trt=Negative Treatment Indicators. Supplemental Scales: A=Anxiety; and MAC-R=MacAndrew–Revised.*

Table 3.9.2.

Descriptive Statistics and Internal Consistency of the TSJO

Sample Breakdown	*M*	*SD*	Skew.	Kurtosis	Cronbach's Alpha	Spearman-Brown	Guttman Split-Half
Combined (71)	4.69	5.11	.380	-.798	.67	.63	.59
Males (52)	4.33	2.78	.589	-.304	.63	.59	.56
Females (19)	5.68	3.28	-.203	-1.159	.71	.69	.58
Trauma (40)	5.78	2.95	.150	-1.100	.63	.63	.59
No Trauma (31)	3.29	2.36	.429	-.897	.55	.38	.39

Table 3.9.3.

Item Reliability for the TSJO: Total Sample

	Alpha Coefficient
"I have a good appetite"	.67
"I am bothered by an upset stomach several times a week"	.67
"I shrink from facing a crisis or difficulty"	.65
"At times I feel like smashing things"	.72
"Once a week or oftener I suddenly feel hot all over, for no real reason"	.66
"I am a very sociable person"	.68
"My memory seems to be alright"	.65
"I frequently notice my hand shakes when I try to do something"	.64
"I sometimes think about killing myself"	.65
"Even when I am with people I feel lonely much of the time"	.61
"I am easily embarrassed"	.66
"I feel anxiety about something or someone almost all the time"	.61
"I have strange and peculiar thoughts"	.64
"The things that some of my family have done have frightened me"	.64
"I feel unable to tell anyone all about myself"	.64
"I am often sorry because I am so irritable and grouchy"	.62
"I have missed a lot of school in my life because of sickness"	.67

Table 3.9.4.

Item Reliability for the TSJO by Gender

	Alpha Coefficient	
	Males	Females
"I have a good appetite"	.63	.71
"I am bothered by an upset stomach several times a week"	.64	.72
"I shrink from facing a crisis or difficulty"	.62	.70
"At times I feel like smashing things"	.67	.77
"Once a week or oftener I suddenly feel hot all over, for no real reason"	.62	.70
"I am a very sociable person"	.62	.76
"My memory seems to be alright"	.61	.72
"I frequently notice my hand shakes when I try to do something"	.62	.65
"I sometimes think about killing myself"	.61	.70
"Even when I am with people I feel lonely much of the time"	.57	.65
"I am easily embarrassed"	.59	.75
"I feel anxiety about something or someone almost all the time"	.57	.67
"I have strange and peculiar thoughts"	.63	.64
"The things that some of my family have done have frightened me"	.62	.66
"I feel unable to tell anyone all about myself"	.62	.65
"I am often sorry because I am so irritable and grouchy"	.59	.64
"I have missed a lot of school in my life because of sickness"	.62	.72

Table 3.9.5.

Item Reliability for the TSJO by Group

	Alpha Coefficient	
	Trauma	No Trauma
“I have a good appetite”	.63	.55
“I am bothered by an upset stomach several times a week”	.65	.53
“I shrink from facing a crisis or difficulty”	.60	.57
“At times I feel like smashing things”	.70	.60
“Once a week or oftener I suddenly feel hot all over, for no real reason”	.62	.55
“I am a very sociable person”	.63	.57
“My memory seems to be alright”	.62	.50
“I frequently notice my hand shakes when I try to do something”	.58	.56
“I sometimes think about killing myself”	.60	.54
“Even when I am with people I feel lonely much of the time”	.57	.47
“I am easily embarrassed”	.62	.56
“I feel anxiety about something or someone almost all the time”	.55	.51
“I have strange and peculiar thoughts”	.62	.49
“The things that some of my family have done have frightened me”	.58	.54
“I feel unable to tell anyone all about myself”	.62	.46
“I am often sorry because I am so irritable and grouchy”	.57	.49
“I have missed a lot of school in my life because of sickness”	.62	.56

Table 3.10.

Logistic Regression Output for TSJO Predicting Group Assignment

	Reported Trauma						
TSJO	β	*SE* β	e^{β}	Wald χ^2	R^2	Accuracy	*N*
Total Score	.341	.104	1.407	10.83***	.23	66.2%	71

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

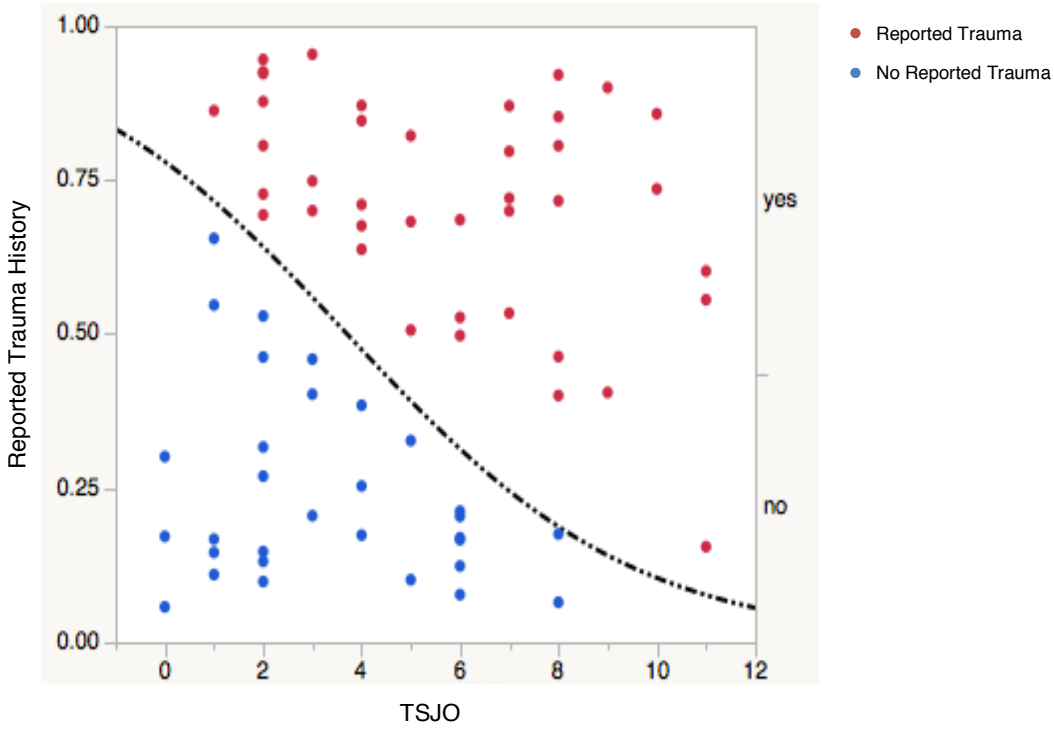


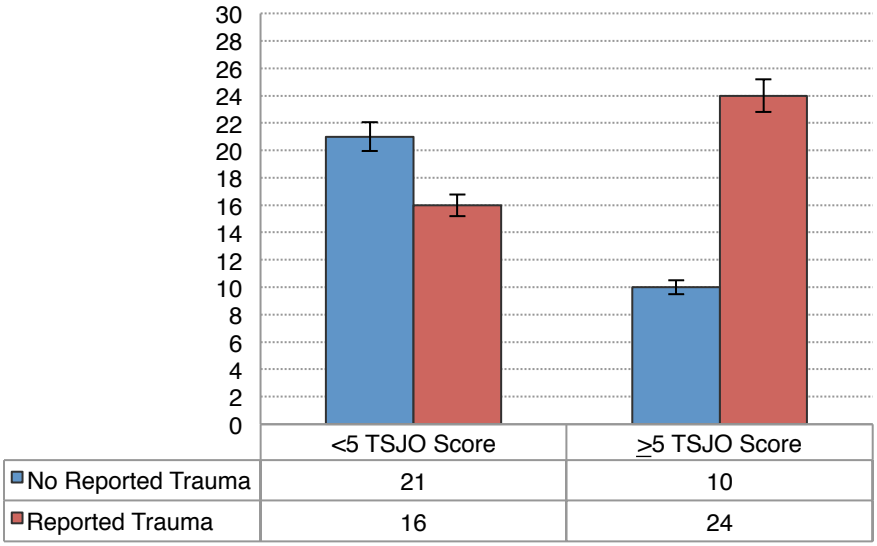
Figure 3.9. *Nominal Logistic Fit of TSJO Assigning Group Membership*

Table 3.11.

Cross Tabulation of TSJO Cutoff Scores

	Cutoff Score				
Trauma History	< 5 points	≥ 5 points	χ^2	φ	*N*
No	21 (67.7%)	10 (32.3%)	5.39*	.28	71
Yes	16 (40.0%)	24 (60.0%)			

* = *p*<.05, ** = *p*<.01, *** = *p*<.001



** Error bars demarcate a five percent interval of case size to approximate error range*

Figure 3.10. *Cross Tabulation of TSJO Cutoff Score Assigning Group Membership*

CHAPTER VI

INTEGRATED DISCUSSION

The aim of the three studies within this dissertation is to establish the validity and reliability of trauma assessment measures specific for juvenile offenders. Construction and provision of such instruments could increase treatment effectiveness for this population by informing more empirically supported mental health services (Butcher et al., 2015; Kerig, 2013). The practices of creating and/or validating population-specific instruments adheres to the core values of counseling psychology by demonstrating awareness and attention to diversity, commitment to a person-environment relational focus, and consideration to individual client characteristics (Delgado-Romero et al., 2012). The use of population-specific instruments also promotes the utilization of clinical expertise (Forrest & Campbell, 2012; Goodheart, 2006), integration of best available research (Kazdin, 2006), and underscores the responsibility of psychologists to improve the mental health field by addressing the unique needs of clients (Toporek, Kwan, & Williams, 2012).

Across-Study Synthesis

The studies within this dissertation examine the predictive utility and diagnostic efficacy of three self-report rating scales for detecting the presence and absence of previous trauma exposure(s) among delinquent youth: *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999), *Behavior Assessment System Assessment for Children, Second Edition—Self-Report of Personality* (BASC-2-SRP; Reynolds & Kamphaus, 2004), and the *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992). Along with examining the aforementioned measures, findings across these studies provide empirical support for three youth offender-specific scales for detecting the presence or absence of previous trauma exposure: CROPS 14-Item Factor, BASC-2-SRP Trauma Composite for Delinquent Girls, and the *Trauma Scale for Juvenile Offenders* (TSJO; Murray, Glaser, & Calhoun, 2013) within the MMPI-A.

Diagnostic Efficacy of Original Measures

Findings across studies yield affirmative results for the diagnostic efficacy of the CROPS full scale, BASC-2-SRP clinical scales, and MMPI-A clinical scales in detecting previous trauma among juvenile offenders. Results from Study One support the trauma-detection utility of the CROPS and provide preliminary support for a stable 3-factor model that partitions the dimension of general trauma into constituent areas. These areas of general trauma include: affective symptoms (Factor One), somatic/dissociative experiences (Factor Two), and avoidance reactions (Factor Three). Results reveal that both the CROPS full scale and 3-factor model provide statistical accuracy in detecting reported trauma histories among both male and female offenders. Trauma-detection accuracies range from 61.1 to 66.7 percent respective to gender and model (i.e. CROPS full scale vs. CROPS 3–Factor).

Findings in Study Two provide support for the BASC-2-SRP clinical scales as a predictor of trauma among adjudicated youth with varying degrees of accuracy. Results reveal that BASC-2 clinical scales predict the absence of trauma in male offenders with 85.4 percent accuracy. In contrast, clinical scales accurately classified the presence of trauma with 30.2 percent accuracy. As a result, findings indicate that BASC-2-SRP clinical scales do not provide sufficient trauma-detection accuracy to warrant use with male juvenile offender populations without the inclusion of supplemental trauma assessment measures.

Unlike male offenders, findings reveal the BASC-2-SRP clinical scales to be a statistical predictor of both the presence and absence of trauma for female offenders. Results indicate that the BASC-2-SRP clinical scales predict the absence of trauma with 70.3 percent accuracy, while accurately detecting the presence of trauma with 66.2 percent accuracy. These findings suggest that BASC-2-SRP clinical scales provide sufficient diagnostic efficacy for use with female juvenile offender populations.

Study Three provides support for the MMPI-A as a predictive measure for detecting trauma-related symptomology in juvenile offender populations. The MMPI-A clinical scales accounting for the majority of trauma detection invariance include the Pa, Pt, Sc, and Si scales. Findings indicate that these MMPI-A clinical scales statistically predict the absence of trauma with 71 percent accuracy and the presence of trauma with 52.5 percent accuracy. Despite statistical predictive accuracy, the negligible sensitivity of the Pa, Pt, Sc, and Si discriminant function (48.8%) indicates limited clinical utility for detecting trauma among this population when in used in isolation without ancillary measures. With respect to MMPI-A profiles, findings indicate that profile clusters within the sample did not statistically classify juvenile offenders with or without previous trauma at more than chance rates.

Diagnostic Efficacy of Scales Specific for Juvenile Offenders

Findings across studies yield two distinct trauma measures for delinquent-specific populations and provide preliminary validation for a pre-established scale for statistically detecting trauma for juvenile offenders. In Study One, the stable 3-factor model for the CROPS indicated an affective symptoms subscale (CROPS 14-Item Factor) to be a viable candidate for operating as an independent trauma screening tool for adjudicated youth. When compared to the CROPS, the CROPA 14-Item Factor statistically detected trauma for detecting trauma with commensurate accuracy for female offenders and increased accuracy for male offenders. Moreover, results suggest the statistical accuracy of the CROPS full scale is heavily weighted on the items within the CROPS 14-Item Factor. Together, results provide preliminary support for the CROPS 14-Item Factor for adjudicated youth that does not sacrifice predictive utility for female offenders and improves detection accuracy for male offenders.

Further examination of the CROPS 14-Item Factor revealed viable cutoff scores for male and female offenders that statistically classified the presence or absence of trauma at more than

chance rates. For female offenders, the CROPS 14-Item Factor cutoff yielded a sensitivity of 75 percent, an improvement over the 68.8 percent sensitivity of the CROPS full-scale cutoff. Regarding specificity, the CROPS 14-Item Factor cutoff indicated comparable classification rates at 62.8 vs. 65.1 percent with the CROPS full-scale cutoff. For male offenders, the CROPS 14-Item Factor cutoff yielded a sensitivity of 65.5 percent, an improvement over the 47.1 percent sensitivity of the CROPS full-scale cutoff. In contrast however, the CROPS 14-Item Factor indicated a reduction in specificity from 73.7 percent to 59.5 percent when compared to the CROPS full scale. Together, findings indicate that the CROPS 14-Item Factor cutoff yields improved sensitivity for both male and female offenders, while reducing specificity for male offenders. Nevertheless, results indicate that the CROPS 14-Item Factor could be a viable tool for detecting trauma among juvenile offenders.

Study Two examined the diagnostic efficacy of the BASC-2-SRP clinical scales for detecting trauma for juvenile offenders. While findings did not indicate diagnostic efficacy in statistically detecting trauma among adjudicated males, results revealed the BASC-2-SRP clinical scales to be an effective trauma detection tool for adjudicated females. Predictive discriminant analysis identified an 11-item cluster that accounted for a large proportion of variance in the accurate detection of previous trauma exposure(s) among female offenders. The 11-item cluster (Trauma Composite) correctly classified female offenders with and without trauma with 70.6 percent sensitivity and 72.1 percent specificity. In sum, the Trauma Composite correctly classified 71.2 to 71.3 percent of adjudicated females, respective of statistical method. This percentage range is an improvement over a chance rate percentage range of 48.8 to 50.4 percent. Results indicated that adjudicated females with scores exceeding the cutoff were 2.54 times more likely to have experienced a previous trauma, with an estimated probability of 70.8 percent. Similarly, adjudicated females with scores falling below the cutoff were 2.64 times more

likely to have *not* experienced trauma, with an estimated probability to 73.4 percent. Overall, preliminary findings indicate the BASC-2-SRP Trauma Composite to be a reliable scale that provides solid predictive and clinical utility for both specifying and accurately detecting adjudicated females with and without reported trauma histories.

Study three provided preliminary cross-validation of the MMPI-A TSJO. Findings indicated that the TSJO total score provided robust contribution for detecting trauma among juvenile offenders with 66.2 percent accuracy, an improvement over the chance rate of 56.3 percent. When examining the diagnostic efficacy of the TSJO cutoff established by Murray, Glaser, and Calhoun (2013), results revealed statistical classification accuracy. Specifically, results indicated a sensitivity of 65.9 percent and specificity of 56.7 percent. Findings indicate that youth with scores exceeding the cutoff were 1.52 times more likely to have experienced prior trauma, with an estimated probability of 67.5 percent. Youth offenders with scores falling below the cutoff were 1.66 times more likely to *not* have trauma, with an estimated probability of 54.8 percent. While these findings are less compelling than the original findings of Murray, Glaser, and Calhoun (2013), with a sensitivity of 77.1 percent and specificity of 70.6 percent, results nevertheless indicate the TSJO to be a generally reliable measure that provides modest contribution to correctly detecting juvenile offenders with or without a prior history of trauma at more than chance rates.

LIMITATIONS

A number of limitations to the current study should be noted. Sample participants across studies were court referred from a relatively small demographic area. The limited demographic region might reduce the generalizability of the findings. Prospective research continuing this line of inquiry should incorporate more diverse samples from demographically varied regions to explore potential differences across variables such as age, ethnicity/race, gender, offense type,

and/or current detention status. In addition, a vast majority of participant data across studies was predominantly gathered within a community mental healthcare setting. Thus, results should not necessarily be generalized to adjudicated youth currently being detained in a correctional facility. Forthcoming research should focus on detained juvenile offenders to examine data patterns and determine the appropriateness of generalizing results of the trauma measures established within this dissertation.

Research has demonstrated a robust relation between trauma-related symptomology and varying psychiatric conditions (e.g. depression, anxiety, obsessive-compulsive behaviors, among others) (Abram et al., 2007; Galatzer-Levy, et al., 2013; Famularo et al., 1996). As such, it is possible that the items comprising the CROPS 14-Item Factor, BASC-2-SRP Trauma Composite, and/or the TSJO tapped into supplementary psychiatric symptoms not necessarily related to, or in absence of, previous trauma exposure(s).

Juvenile offenders have been shown to underreport the severity of symptoms on self-report measures (Sibley et al., 2010; Nadar, 2008; Newman, 2002). Reliance on youth self-report might serve to underestimate symptom severity regarding trauma incidences (Vergano, Lauriola, & Speranza, 2015). Such underestimation or underreporting of symptoms could potentially increase the probability of committing Type I error. Moreover, youth offenders within the juvenile justice system tend to be unwilling or disinclined to divulge prior exposure(s) to possibly stigmatizing events (Kerig, 2013). Such apprehension to disclose traumatic experiences can serve to reduce the reliability of acquiring dependable self-report data (Bennett & Kerig, 2014). Ascertaining accurate knowledge of trauma history can be further complicated by how youth define their experiences (Kerig, Moeddel, & Becker, 2011; Resick et al., 2012).

Juvenile offenders develop coping strategies to help them navigate and adapt to toxic environments (Ford et al., 2006). Such strategies can manifest as emotional avoidance in the

expression of juvenile delinquency (Bennett & Kerig, 2014; Ford et al., 2006). Consequently, youth may not consider a previous trauma to be traumatic given their proclivities to avoid or suppress overwhelming emotional states as an adaptive survival mechanism (Bennett & Kerig, 2014; Ford et al., 2006). Given the possible reticence and other potential barriers to disclosing previous trauma experiences, the reliance on only one to three sources of historical data to corroborate reported trauma histories, or lack thereof, serves as a limitation across studies.

Response validity concerns were amplified in Study One given that the CROPS does not have imbedded items to determine profile validity. There is currently no strategy on the CROPS for identifying response inconsistency, random responding, and/or biased response styles such as acquiescence or nonacquiescence. Thus, there is a possibility that invalid CROPS profiles were included in the data analyses of Study One. While this limitation does not fully extend to Studies Two or Three, vis-à-vis validity indices found within the BASC-2-SRP and MMPI-A, researchers working with adjudicated youth should be especially vigilant for potential inclusion of invalid profiles.

Prospective Research

While initial results are promising, more research is needed to confirm the viability of the youth offender-specific trauma assessment tools preliminarily validated within this dissertation. Additional research examining the statistical accuracy, psychometric stability, and clinical applicability of these measures is warranted. Further, researchers continuing this line of inquiry are advised to consider how the construction, validation, and/or application of youth offender–specific instruments coalesce with a broader framework oriented toward the promotion of social justice and dissemination of the values underpinning Counseling Psychology.

Psychometric Considerations: Stability, Reliability, and Validation

Preliminary research on validating the CROPS 3–Factor model* is underway; however, future studies are advised to cross-validate the CROPS 14-Item Factor cutoffs for adjudicated populations. Cross-validation of the CROPS 14-Item Factor cutoff should be conducted to examine the efficacy of the measure for accurately detecting adjudicated youth with and without previous trauma exposure(s). Within this vein, prospective studies are advised to procure multiple sources of information to increase accuracy in detecting trauma histories among juvenile offenders. In addition, it is recommended that validity items be developed for this measure. Inclusion of validity items would provide a mechanism for identifying invalid profiles, thus increase diagnostic efficacy.

For the BASC-2-SRP Trauma Composite for delinquent girls, future studies are recommended to cross-validate the Trauma Composite cutoff for female youth offender populations. It is important to note that the BASC-2-SRP is falling out of use after the recent release the third edition (BASC-3-SRP; Reynolds & Kamphaus, 2015). Although all items included in the Trauma Composite were carried over in the BASC-3-SRP, it is vital that the consistency of the Trauma Composite between the BASC editions be examined.

Regarding the TSJO, prospective research is advised to cross-validate the TSJO with an empirically validated trauma instrument using juvenile offenders. Supplementary validation should serve to solidify the measure as a valid and reliable tool for trauma-related symptom detection for youth offender populations. Demographically, a limitation of Study Three was the number of female offenders within the sample. Research indicates that personality profiles differ between male and female offenders (Aalsma & Lapsley, 2001). As a consequence, prospective scholarship should include a larger sample of female offenders to allow for separate analyses.

*Refer to Appendix A for supplementary validation study.

Results may illuminate to degree to which personality profiles can aid in the detection of trauma across both male and female offender populations.

The abovementioned psychometric considerations address, but are not necessarily limited to, the respective studies in which they are discussed. That being said, some across-study considerations should also be noted. While each scale may be used upon administration of their respective parent measures, construction of screening tools using the items comprising the trauma scales could potentially aid mental clinicians with diagnostic and/or treatment-related decisions. As such, it is recommended that prospective research examine the diagnostic efficacy of each trauma scale in order to examine the strength of assumed local independence of item placement within each measure (Henard, 2002). In addition, forthcoming research examining all trauma scales should seek to procure many sources of historical information to augment historical accuracy with respect to past trauma histories among adjudicated youth.

Clinical Applications

After addressing the psychometric considerations outlined in the previous section, numerous clinical applications could be studied. The proposed youth offender-specific measures are short, convenient, and user friendly with respect to measure format and scoring procedure.* The structure of these measures are conducive for various clinical applications for adjudicated youth, including but not limited to, trauma screening, psychological evaluation, litigation considerations, provision of evidence-based treatments, and response to intervention. As there is need for trauma screening measures specific for adjudicated youth (Ford, 2011), the proposed measures in this dissertation may better inform the service providers responsible for making such psychological an/or legal recommendations. Thus, it is recommended that prospective research explore appropriate avenues for application of the proposed measures.

*See Appendix E for a visual illustration of measure formats for each trauma screening tool.

CONCLUSION

The research within this dissertation was specifically focused on psychometric detection of trauma-related symptomology among juvenile offender populations. While the aims of this dissertation are specific, they are a part of a broader conversation that asks how we can reduce delinquent criminality by applying evidence-based methods and promoting social justice alongside the values of Counseling Psychology. It has also been this author's aim that the findings from these studies can plug into the very practical conversations that are happening every day at juvenile detention centers across the country. With limited funding, limited staffing, and limited resources, our juvenile justice clinicians are faced with the reality of making difficult decisions with a modicum of data. These decisions – whether a juvenile offender qualifies for this therapy group or that intervention – have real and sometimes deleterious effects on the lives of some of our most vulnerable youth. This research is intended to provide tools that help practitioners better detect kids that have experienced trauma. In doing so, we can better align and administer resources to help and heal these youth. Though it is just one step in the multitier, political edifice of our country's juvenile justice system, it is a step that this dissertation has demonstrated is achievable.

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APPENDIX A

SUPPLEMENTAL RESEACH:

PRELIMINARY VALIDATION OF THE CHILD REPORT OF POSTTRAUMATIC SYMPTOMS

3–FACTOR MODEL FOR ADJUDICATED YOUTH*[**]

*Edner, B. J., Glaser, B. A., Calhoun, G. B., & Piegore, A. (March 2018). Preliminary validation of the Child Report of Posttraumatic Symptoms (CROPS) 3–Factor model for adjudicated youth. Presented at the 64th annual meeting of the *Southeastern Psychological Association* (SEPA), Charleston, SC.

**Citation of the manuscript adapted from the abstract is provided below:
Edner, B. J., Piegore, A. Glaser, B. A., & Calhoun, G. B. (2018). Cross-Validation of the Child Report of Posttraumatic Symptoms (CROPS) 3–Factor for adjudicated youth. To be submitted to *Child and Youth Care Forum: Journal of Research and Practice in Children's Services.*

Abstract

Objective: The *Child Report of Posttraumatic Symptoms (CROPS)* is a short and effective trauma assessment tool. For juvenile offenders, factor analytic work has demonstrated a stable 3-factor model with commensurate accuracy for adjudicated females and improved predictive accuracy for adjudicated males. However, the CROPS 3–Factor has yet to be cross-validated with an empirically established trauma assessment tool. ***Method:*** Retrospective data of 77 adjudicated youth (59.7% males) were used to examine the reliability of the CROPS 3–Factor and its relation to the *Trauma Symptom Checklist for Children (TSCC).* Cronbach's alpha, Spearman-Brown, and Guttman split-half reliability coefficients were calculated to examine measure reliability. Pearson product-moment correlations between the CROPS 3–Factor and the TSCC were conducted. ***Results:*** Findings indicated acceptable to strong reliability coefficients ranging from $r = .65$ to .87 for the total sample and by gender. Bivariate correlations revealed that CROPS Factor One and Factor Two scales statistically related to all TSCC scales. Factor Three did not correlate with the Dissociation: Fantasy subscale and the Anger scale on the TSCC. All other correlations were statistically significant. ***Conclusion:*** Overall findings provide moderate support for the utility of the CROPS in accurately identifying previous trauma exposure(s) among adjudicated youth and provide preliminary support for a 14-item version of the CROPS for screening for trauma symptoms in adjudicated youth. Results reveal the CROPS 3–Factor to be a reliable instrument for measuring trauma symptoms among juvenile offenders. These results provide preliminary construct validation of the CROPS 3–Factor for use with adjudicated youth. Findings provide support for employing the CROPS 3–Factor as a trauma screening measure for this population.

Keywords: Trauma, Assessment, Juvenile offender, CROPS

Introduction

The *Child Report of Posttraumatic Symptoms* (CROPS) is a 26-item measure that screens for a broad range of posttraumatic symptoms in children and adolescents and provides information about symptom severity. Numerous studies have established the validity, reliability, and internal consistency of the CROPS for juvenile offenders populations (Greenwald et al., 2001; Perkins, Calhoun, & Glaser, 2014; Perkins et al., 2016; Edner, Glaser, & Calhoun, 2017). Recently, Edner, Glaser, and Calhoun (2017) found support for a three-factor structure of the CROPS (CROPS 3–Factor) with adjudicated youth that provides improved accuracy in detecting previous trauma exposure among male offenders and comparable detection accuracy among female offenders when compared to the CROPS total score.

Within the CROPS 3–Factor, Factor One (F1) is comprised of 14 items thought to measure affective symptoms commonly observed in trauma-related stress (Edner, Glaser, & Calhoun, 2017; Kerig et al., 2016a). Based on item content, high scores on F1 suggest feelings of anxiety oriented around the anticipation of negative future events. High scores suggest a youth that is experiencing a sense of inadequacy with depressive symptoms characterized by feelings of guilt, sadness, and isolation with accompanying sleep and concentration difficulties.

Factor Two (F2) is comprised of six items that are thought to measure somatic/dissociative symptoms common in trauma-related stress reactions (Edner, Glaser, & Calhoun, 2017; Herman, 2012). High scores on F2 suggest a youth that has a propensity to daydream and/or appear absent during interpersonal interactions. Respondents with high scores could be characterized as an individual who may appear lethargic with a tendency to experience physical pain or physical sensations.

Factor Three (F3) is comprised of four items that are thought to measure avoidance reactions typical of trauma (Edner, Glaser, & Calhoun, 2017; Teicher & Samson, 2016).

Respondents with high scores on F3 suggest an individual who ruminates on past negative experiences, employing strategies to avoid negative thoughts or feelings. However, while symptom clusters within the CROPS 3–Factor structure are characteristic of trauma-related stress reactions, the CROPS 3–Factor has yet to be validated with an established trauma assessment measure (Edner et al., 2017).

The *Trauma Symptom Checklist for Children* (TSCC; Briere, 1996) was used as a measure of validity for the CROPS 3–Factor. The TSCC was developed to assess for trauma-related symptomology in children and adolescents (Briere, 1996). The TSCC is one of the best-known measures for documenting various trauma-related symptoms (Milne & Collin-Vezina, 2015) and is the most commonly used trauma assessment tool for children and adolescents in clinical settings (Elhai, Gray, Kashdan, & Franklin, 2005). The TSCC is recommended for both brief trauma screenings and in-depth trauma assessments (Milne & Collin-Vezina, 2015) for informing diagnostic considerations (Osterberg, Jensen-Doss, Cusack, & De Arellano, 2009) as well as measuring treatment outcomes (De Young & Kenardy, 2017; Overbeek et al., 2017; Bal, Crombez, Van Oost, & Debourdeaudhuij, 2003; Bray & Caraway, 2002)

The TSCC was selected as the validation measure in this study based on its robust empirical foundation (Briere, 1996). Research indicates that the TSCC demonstrates high internal consistency across all scales with alphas ranging from $r = .77$ to .89 (Briere, 1996). Strand, Sarmiento, and Pasquale (2005) report that findings across studies support strong construct validity (Elliot & Briere, 1994; Evans, Briere, Boggiano, & Barrett, 1994; Singer, Anglin, Song, & Lunghofer, 1995), criterion validity (Diaz, 1994), convergent validity, and discriminant validity (Brier & Lanktree, 1995; Evans et al., 1994; Friedrich & Jaworski, 1995) for the TSCC. Further, numerous studies have indicated strong clinical utility of the TSCC for juvenile offender populations due to the breadth of trauma symptomology that is captured by the measure (Briere,

1996; Ford et al, 2008; Wolpaw, et al., 2005). Research using the TSCC with adjudicated youth populations demonstrates strong psychometric properties with stable factor structure (Flaherty, 2017; Zito, 2016; Butcher, Kretschmar, Singer, & Flannery, 2015; Nilsson, Wadsby, & Svedin, 2008).

Study Aims. The current study addresses two primary aims. First, this study seeks to examine the reliability of CROPS 3–Factor for a juvenile offender sample. For the second aim, this study seeks to provide cross-validation for the CROPS 3–Factor by examining correlations between this measure and TSCC scales and subscales.

Method

Participants

Participants consisted of a sample of adjudicated youth referred for clinical services by the Department of Juvenile Justice (DJJ). Participants were evaluated following conviction of an offense. Youth offense types included crimes against person, crimes against property, drug charges, and status offenses. Caregivers provided consent for all participant data to be used for research purposes.

Retrospective data of 77 juvenile delinquents consisting of 46 males (59.7%) and 31 females (40.3%) was used for this study. The ethnic breakdown consisted of 47 African-American (61%), 15 White (19.5%), 11 Latinx (14.3%), and four Multiracial participants (5.2%). Age of participants ranged from 13 to 17 years (M = 15.23; SD = 1.06). Within the sample, 42 participants experienced previous trauma exposure (54.5%), while 35 youth did not report previous trauma (45.5%).

Demographic data were gathered through clinical interviews, DJJ referral information, and Juvenile Tracking System (JTS) data. Participants were included in the current study if they

met the following criteria: 1) the CROPS and TSCC were completed in a valid manner* during the clinical interview, and 2) if information regarding the absence or presence of previous trauma exposure was obtained during the course of the clinical interview and/or psychological testing. Refer to Table 4.1.1 – 4.1.2 and Figures 4.1.1 – 4.1.2 for a breakdown of demographics for the total sample and by gender.

Procedure

Trauma is defined as direct and/or vicarious exposure to violent or stressful event(s) early in life that exceed the dependable coping and/or defensive operations employed to counter the psychological impact of the event(s) (Terr, 1991; Maschi, 2006; American Psychological Association, 2013). At least one reported traumatic event must have occurred prior to first legal offense(s). Trauma types were categorized by 1) exposure to physical and/or emotional abuse; 2) sexual abuse/assault; 3) emotional and/or physical neglect or deprivation; 4) grief reactions resulting from loss/separation from a loved one; 5) exposure to domestic or community violence; 6) experiencing two or more of the aforementioned trauma types; and 7) or a single traumatic event as reported by JTS data.

According to acquired data, 43 (55.8%) participants were reported to have experienced at least one previous trauma. The majority of participants with trauma history endorsed experiencing multiple types of trauma (21; 48.8%). Remaining participants with trauma history reported only one trauma type. Eight participants presented with single event traumas as reported by JTS data (18.6%), six participants reported physical abuse (14%), five participants reported sexual abuse/assault (11.6%), two participants reported witnessing domestic and/or community violence (4.7%), and one participant reported a history of grief and loss (2.3%).

*Data were excluded if scores on either TSCC validity scale exceeded the recommended invalidity cutoffs: Underresponse > $T = 70$; Hyperresponse > $T = 89$ (Briere, 1996).

Instruments

Traumatic Symptom Checklist for Children (TSCC). The TSCC is a 54-item self-report questionnaire that measures trauma-related symptomology in children and adolescents (Briere, 1996). The TSCC is comprised of two validity indicators, which include the Underresponse and Hyperresponse scales. The Underresponse measures a respondent's tendency "toward denial, a general under endorsement response set, or a need to appear unusually symptom-free" (Briere, 1996, p. 2). The Hyperresponse "indicates a general overresponse to TSCC items, a specific need to appear especially symptomatic, or a state of being overwhelmed by traumatic stress" (Briere, 1996, p. 2). The TSCC scales consist of six clinical scales that assess common dimensions of trauma-related symptom manifest. The clinical scales of the TSCC include: 1) Anxiety, 2) Depression, 3) Anger, 4) Posttraumatic Stress, 5) Dissociation, and 6) Sexual Concerns. The Dissociation scale is comprised of the Overt Dissociation and Fantasy Dissociation subscales, while the Sexual Concerns scale contains the Sexual Preoccupation and Sexual Distress subscales (Briere, 1996). A description of each clinical scale can be found in Table 4.2. Refer to Tables 4.3.1 – 4.3.3 and Figure 4.2.1 for descriptive statistics and clinical profiles of the TSCC.

Child Report of Posttraumatic Symptoms (CROPS). The CROPS is a 26-item self-report questionnaire that screens for symptoms of child trauma (Greenwald & Rubin, 1999) and posttraumatic stress found in the DSM-IV (APA, 1994). CROPS respondents are required to report symptoms experienced in the past week on a Likert-type scale (0 = *none*, 1 = *some*, 2 = *lots*). For this study, items will be totaled corresponding to factors within the 3-factor model (Edner, Glaser, & Calhoun, 2017). The CROPS has demonstrated good validity, reliability, and sensitivity across settings and populations (Greenwald & Rubin, 1999). Refer to Table 4.3.3 and Figure 4.2.2 for descriptive statistics and clinical profiles of the CROPS 3–Factor.

Data Analysis

The Statistical Package for the Social Sciences (SPSS), JMP Statistical Software, and Microsoft Excel was used for data storage, statistical analyses, and data visualization. Data were screened for univariate outliers prior to analysis. Values exceeding a Z-score 3.2 standard deviations above group means were excluded from analyses. Univariate outliers were removed to improve accuracy estimates by decreasing the probability of committing both Type I and Type II error (Osborne, 2001).

Reliability Estimates of CROPS 3–Factor

Reliability of the CROPS 3–Factor was analyzed by calculating split-half reliability, Spearman-Brown coefficients for measure length impact, and Cronbach's alpha coefficients for intraclass correlations. Next, researchers performed two-tailed Pearson product-moment correlations with the CROPS 3–Factor and TSCC scales with 95 percent confidence.

Results

Results revealed acceptable to good reliabilities across factors. For intraclass correlations and split-half reliability, findings indicate Factor One demonstrated strong internal consistencies for the total sample with reliability coefficients ranging from $r = .83$ to .84. When split by gender, reliability coefficients ranged from $r = .78$ to .82 for male offenders and $r = .85$ to .87 for female offenders. Similarly, Factor Two indicated strong internal consistencies with reliability coefficients ranging from $r = .74$ to .77 for the total sample, $r = .71$ to .76 for male offenders, and $r = .74$ to .75 for female offenders. Factor Three demonstrated acceptable to moderate reliability with coefficients ranging from $r = .68$ to .71 for the total sample. Male offenders demonstrated acceptable reliability ($r = .65 – .67$) while female offenders demonstrated moderate reliability ($r = .72 – .76$). Refer to Table 4.4.1 – 4.4.4 for both factor and item reliabilities for the CROPS 3–Factor.

Pearson Product-Moment Correlations

To examine relations between the CROPS 3–Factor and the TSCC, authors performed two-tailed Pearson product-moment correlations with the CROPS factors and all TSCC scales with 95 percent confidence. Refer to Tables 4.5.1 – 4.5.3 for primary correlations between the CROPS 3–Factor and TSCC and Tables 4.6.1 – 4.6.5 and Figures 4.3.1 – 4.3.5 for full correlation scatterplot matrices for the CROPS 3–Factor and TSCC scales.

Results

CROPS 3–Factor statistically correlated with TSCC scales for both the total sample and by gender. For the total sample, F1 most strongly correlated with the TSCC Anxiety (ANX) (r = .651, p < .001) and Dissociation (DIS) scales (r = .617, p < .001). F1 also strongly correlated with the TSCC scales of Depression (DEP) (r = .506, p < .001) and Posttraumatic Stress (PTS) (r = .435, p < .001). While indicating a smaller effect size, F1 statistically correlated with the Sexual Concerns (SC) (r = .379, p < .001) and Anger (ANG) scales (r = .363, p = .001). F2 most strongly correlated with the DIS (r = .421, p < .001), ANX (r = .400, p < .001) and SC scales (r = .381, p < .001). F2 also correlated with the DEP (r = .300, p = .008) and PTS scales (r = .280, p = .014). F2 did not statistically correlate with the ANG scale at the alpha = .05 level. F3 strongly correlated with the PTS scale (r = .493, p < .001) followed by the ANX (r = .320, p = .005), DIS (r = .317, p = .005), SC (r = .306, p = .007), and DEP scales (r = .246, p = .031). In contrast, F3 did not correlated with the ANG scale on the alpha = .05 level.

When split by gender, similar patterns emerged. For male offenders, F1 most strongly correlated with the DIS (r = .667, p < .001), ANX (r = .609, p < .001), and DEP scales (r = .569, p < .001). While indicating a smaller effect size, F1 statistically correlated with the PTS (r = .393, p = .007) and ANG scales (r = .324, p = .028). The SC scale did not statistically correlate with F1 on the alpha = .05 level. F2 statistically correlated with the ANX (r = .379, p = .009), DEP (r =

.346, $p = .019$), DIS ($r = .337$, $p = .021$), and SC scales ($r = .293$, $p = .048$). F2 did not correlate with PTS or ANG scales at the alpha = .05 level. F3 strongly correlated with the ANG scale ($r = .416$, $p < .004$) followed by the PTS ($r = .395$, $p = .007$), and DEP scales ($r = .318$, $p = .031$). F3 did not correlate with the DIS or SC scales on the alpha = .05 level.

For female offenders, F1 correlated with all TSCC scales. F1 most strongly correlated with the ANX ($r = .787$, $p < .001$) and PTS scales ($r = .632$, $p < .001$) followed by SC ($r = .582$, $p < .001$), DIS ($r = .577$, $p < .001$), and DEP scales ($r = .523$, $p < .003$). The ANG scale did not statistically correlate with F1 on the alpha = .05 level. F2 statistically correlated with the ANX ($r = .542$, $p < .016$), DIS ($r = .521$, $p < .003$), PTS ($r = .498$, $p = .004$), PTS ($r = .498$, $p = .004$), and SC scales ($r = .486$, $p = .006$). F2 did not statistically correlate with the ANG or DEP scales at the alpha = .05 level. F3 strongly correlated with the PTS scale ($r = .658$, $p < .001$) followed by the ANX ($r = .495$, $p = .005$), SC ($r = .477$, $p = .007$), and DIS scales ($r = .363$, $p = .045$). In contrast, F3 did not correlated with the ANG or DEP scales on the alpha = .05 level.

Discussion

Results reveal the CROPS 3–Factor as a reliable instrument for measuring trauma symptoms among both male and female juvenile offenders. Results indicate statistical correlations between the CROPS 3–Factor and the TSCC scales. These findings provide preliminary construct validation of the CROPS 3–Factor for adjudicated youth and support the use of the CROPS 3–Factor as a trauma screening measure for this population.

The CROPS Affective Symptoms subscale (F1) demonstrated strong correlations, primarily clustering around the Anxiety, Depression, Posttraumatic Stress, and Dissociation scales for both male and female offenders. These statistical relations suggest that the F1 subscale on the CROPS largely relates to these constructs as measured by the TSCC. In addition, F1 demonstrate moderate relation to the Anger scale of the TSCC. Statistical relations

between these TSCC scales and F1 are commensurate with F1 scale content, predominately measuring the affective or mood-based reactions consistent with trauma-related stress. When examined by gender, findings remained consistent with the exception of the Sexual Concerns scale. Specifically, F1 correlated to the Sexual Concerns scale for female offenders, but not for male offenders. This relational difference is consistent with previous research indicating that sexual abuse/assault is more common in female offenders compared to their male counterparts (Dembo, Schmeidler, & Childs, 2007; Martin et al., 2008; Wood et al., 2002).

The CROPS Somatic/Dissociative subscale (F2) statistically correlated with the Anxiety, Depression, Dissociation, and Sexual Concerns scales of the TSCC. F2 did not correlate with the Anger scale for male or female offenders. Among female offenders, F2 strongly correlated with the Posttraumatic Stress scale of the TSCC, while F2 did not correlate with this scale for male offenders. Correlations indicate that the F2 subscale demonstrates a similar relational pattern of the F1 subscale, but with diminished magnitude of effect. While F2 subscale items appear to measure symptoms characteristic of somatization and dissociation, the pattern of F2 and TSCC scale correlations do not appear to provide additional information compared to F1.

The CROPS Avoidance Reactions subscale (F3) demonstrated distinct patterns between male and female offenders. The F3 subscale statistically related to the Posttraumatic Stress scale of the TSCC for both male and female offenders. However, among male offenders, the F3 subscale correlated with the Anger and Depression scales, while correlating with the Anxiety, Dissociation, and Sexual Concerns scales for female offenders. Together, these patterns suggest that the avoidance reactivity-based content within the F3 subscale relate to differing trauma symptom domains based on gender. A pattern of higher scores on Sexual Concerns and Dissociation scales relate to past sexual abuse (Hébert, Langevin, & Oussaïd, 2018). As such,

higher correlations with the Sexual Concerns scale across CROPS factors are not is unexpected for female offenders.

Together, findings suggest that the F1 subscale operates as a measure of general or broad trauma symptomology among this population. While the results provide support of the CROPS 3–Factor as a stable measure, the results also indicate that F2 and F3 subscales do not uniquely relate to TSCC scales above the impact of the F1 subscale. As such, F2 and F3 subscales do not seem to yield additional data beyond that provided by F1. The notion that the 14-item F1 subscale provides majority of meaningful information for detecting trauma among the juvenile offender populations is consistent with prior research (*see* Edner, Glaser, & Calhoun, 2017). Specifically, Edner, Glaser, and Calhoun (2017) found that F1 was the only statistical predictor for accurately detecting the presence or absence of reported trauma among juvenile offenders. In sum, results suggest that while the CROPS 3–Factor is a reliable instrument; the 14-item F1 subscale provides the majority of diagnostic information and could effectively operate as a 14-item abbreviated version of the CROPS specific for juvenile offender populations based on the findings of this study.

While results indicate the CROPS 3–Factor to a reliable measure of trauma-related symptom severity among juvenile offenders, a number of limitations to the current study should be noted. The sample of adjudicated youth in this study was court referred from a small demographic area; this may limit the generalizability of the findings. As such, future research continuing this line of study require samples from more demographically diverse regions to investigate differences that may exist based on variables such as ethnicity/race, offense type, age, and current detention status. Moreover, reliance on youth self-report may introduce varying degrees of error as well as provide underestimates of symptom severity on trauma incidences (Vergano, Lauriola, & Speranza, 2015).

Youth may be resistant to report exposure to potentially stigmatizing events (Perkins et al., 2016). Ascertaining accurate knowledge of trauma can be further complicated by how youth define their experiences (Kerig, Moeddel, & Becker, 2011) as well as by youth employing emotional avoidance processes in the manifestation of adolescent delinquency (Marsiglio et al., 2014). This concern is amplified given that the CROPS does not have imbedded validity/reliability items to determine profile validity. There is currently no strategy for identifying response inconsistency or biased response styles such as acquiescence or nonacquiescence. Thus, there is a possibility that invalid CROPS profiles were included in the data analysis. Further, as trauma symptom manifest can overlap with other mental health problems such depression, anxiety, obsessive compulsive behavior, etc. (American Psychiatric Association, 2013), it is possible that the CROPS items tapped into other psychiatric symptoms not necessarily related to, or in absence of, previous trauma exposure(s).

Despite the aforementioned limitations, significant results were found. Overall findings provide moderate support for the CROPS 3–Factor as a stable and reliable trauma measure for adjudicated youth. Consistent with prior research, the F1 subscale (CROPS 14-item Factor) appears to provide majority information on the detection and severity of trauma-related symptoms among juvenile offenders. This study provides further evidence of the potential clinical utility for the CROPS 14-Item Factor as a trauma symptom screening measure specific for adjudicated youth. Future research should examine the clinical utility and psychometric stability of the CROPS 14-Item Factor to determine if this measure can serve as a viable screening tool for trauma symptoms among adjudicated youth.

Tables and Figures

All data visualization in this section used consistent color-coding to represent sample derivations. The color key used throughout this section is provided below.

- = No reported history of trauma
- = Reported history of trauma via procedural methods discussed in body of manuscript
- = Total sample: Combination of both trauma and non-trauma groups
- = Female gender
- = Male gender
- = Ethnicity

Table 4.1.1.

Demographic Characteristics (N = 77)	Frequency	Percentage
Gender		
Males	46	59.7%
Females	31	40.3%
Trauma History		
No Reported Trauma	34	44.2%
Reported Trauma	43	55.8%
Trauma Type		
Physical Abuse	6	14.0%
Sexual Abuse/Assault	5	11.6%
Neglect	0	0%
Grief and Loss	1	2.3%
Witnessed Domestic Violence	2	4.7%
Multiple Traumas	21	48.8%
Single Event Traumas	8	18.6%
Ethnicity		
African American	47	61.0%
White	15	19.5%
Latinx	11	14.3%
Multiracial	4	5.2%

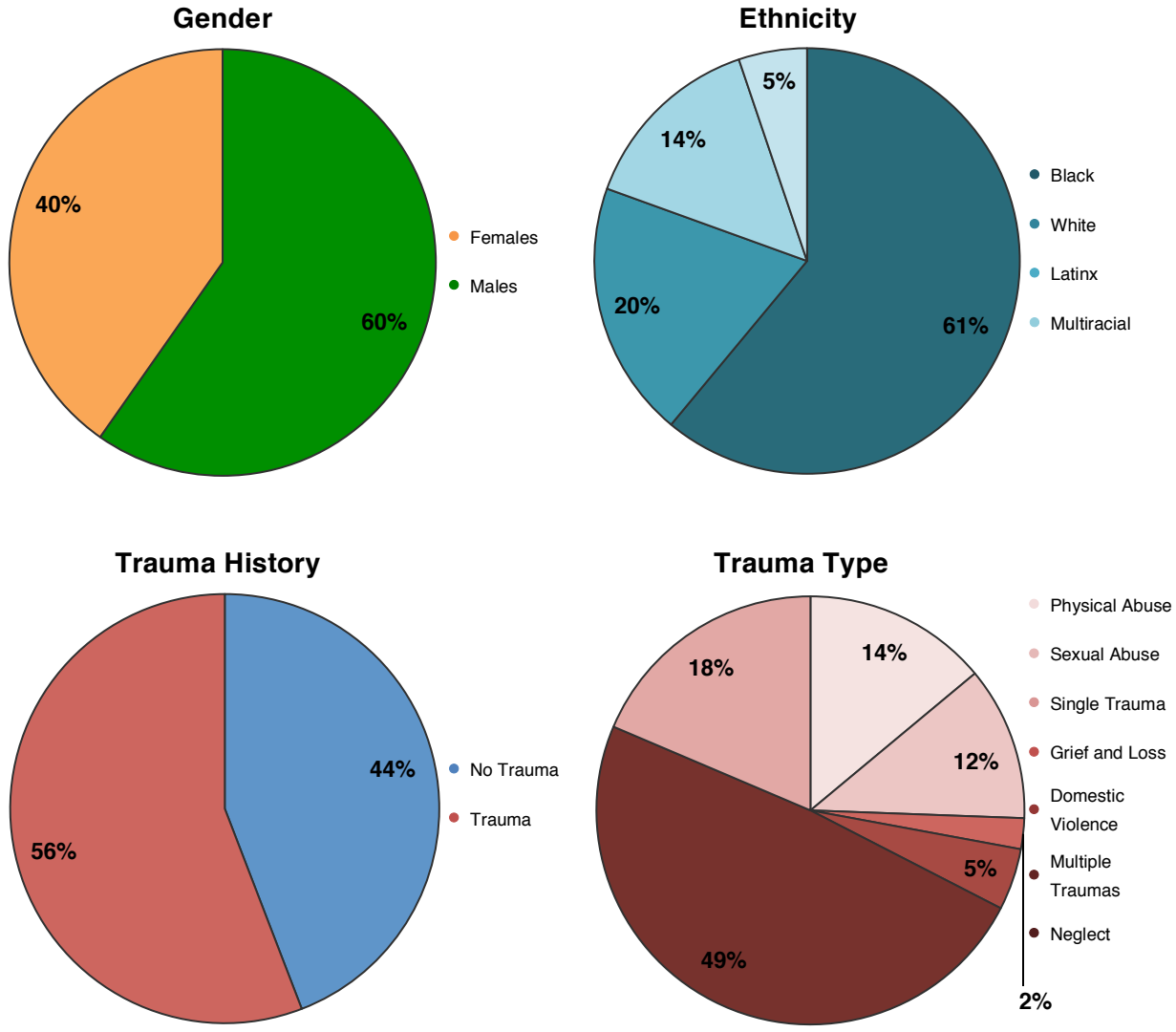


Figure 4.1.1. *Graphic Depiction of Demographic Characteristics*

Table 4.1.2.

Demographic Characteristics by Gender

	Females (*N* = 31)		Male (*N* = 46)	
	Frequency	Percentage	Frequency	Percentage
Trauma History				
No Reported Trauma	11	35.5%	23	50.0%
Reported Trauma	20	64.5%	23	50.0%
Trauma Type				
Physical Abuse	2	10.0%	4	17.4%
Sexual Abuse/Assault	3	15.0%	2	8.7%
Neglect	0	0%	0	0%
Grief and Loss	1	5.0%	0	0%
Witnessed Domestic Violence	1	5.0%	1	4.3%
Multiple Traumas	10	50.0%	11	47.8%
Single Event Trauma	3	15.0%	5	21.7%
Ethnicity				
African American	17	54.8%	30	65.2%
Anglo American	6	19.4%	9	19.6%
Latinx	6	19.4%	5	10.9%
Multiracial	2	6.5%	2	4.3%

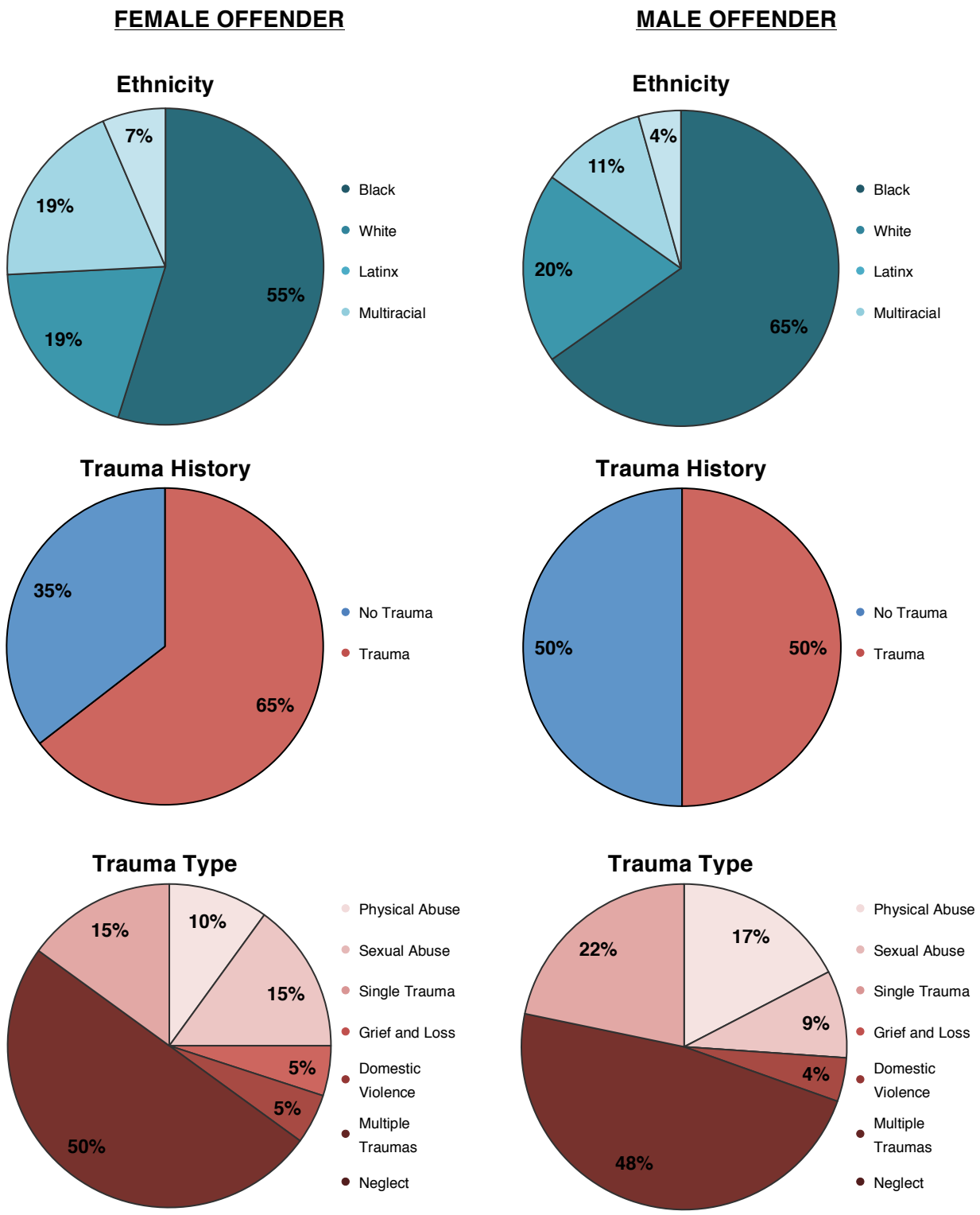


Figure 4.1.2. *Graphic Depiction of Demographic Characteristics by Gender*

Table 4.2.

Description of TSCC Clinical Scales

Scale	Description
Anxiety (ANX)	Generalized anxiety, hyperarousal, and worry; specific fears (e.g., of men, women, or both; of the dark; of being killed); episodes of free-floating anxiety; and a sense of impending danger.
Depression (DEP)	Feelings of sadness, unhappiness, and loneliness; episodes of tearfulness; depressive cognitions such as guilt and self-denigration; and self-injuriousness and suicidality.
Anger (ANG)	Angry thoughts, feelings, and behaviors, including feeling mad, feeling mean, and hating others; having difficulty de-escalating anger; wanting to yell at or hurt people; and arguing and fighting.
Posttraumatic Stress (PTS)	Posttraumatic symptoms, including intrusive thoughts, sensations, and memories of painful past events; nightmares; fears; and cognitive avoidance of painful feelings.
Dissociation (DIS)	Dissociative symptomatology, including derealization; one's mind going blank; emotional numbing; pretending to be someone else or somewhere else; day-dreaming; memory problems; and dissociative avoidance. Has two subscales: DIS-O (Overt Dissociation) and DIS-F (Fantasy).
Sexual Concerns (SC)	Sexual thoughts or feelings that are atypical when they occur earlier than expected or with greater than normal frequency; sexual conflicts; negative responses to sexual stimuli; and fear of being sexually exploited. Has two subscales: SC-P (Sexual Preoccupation) and SC-D (Sexual Distress).

Table 2.1. Excerpted from Briere (1996; p. 2)

Table 4.3.1.

Descriptive Statistics for TSCC Scales: Total Sample

Total sample (N = 77)	*M*	*SD*	Skewness	Kurtosis
Anxiety (ANX)	45.09	6.51	0.97	0.50
Depression (DEP)	48.77	8.48	1.13	1.05
Anger (ANG)	50.03	8.98	0.72	-0.39
Posttraumatic Stress (PTS)	47.79	7.81	0.88	0.54
Dissociation (DIS)	47.04	7.85	0.85	0.08
Overt Dissociation (DIS-O)	47.61	8.10	1.09	1.09
Fantasy (DIS-F)	46.48	7.35	0.90	0.71
Sexual Concerns (SC)	49.73	9.37	0.53	-0.63
Sexual Preoccupation (SC-P)	49.13	8.31	0.73	-0.11
Sexual Distress (SC-D)	51.73	12.96	1.39	0.80

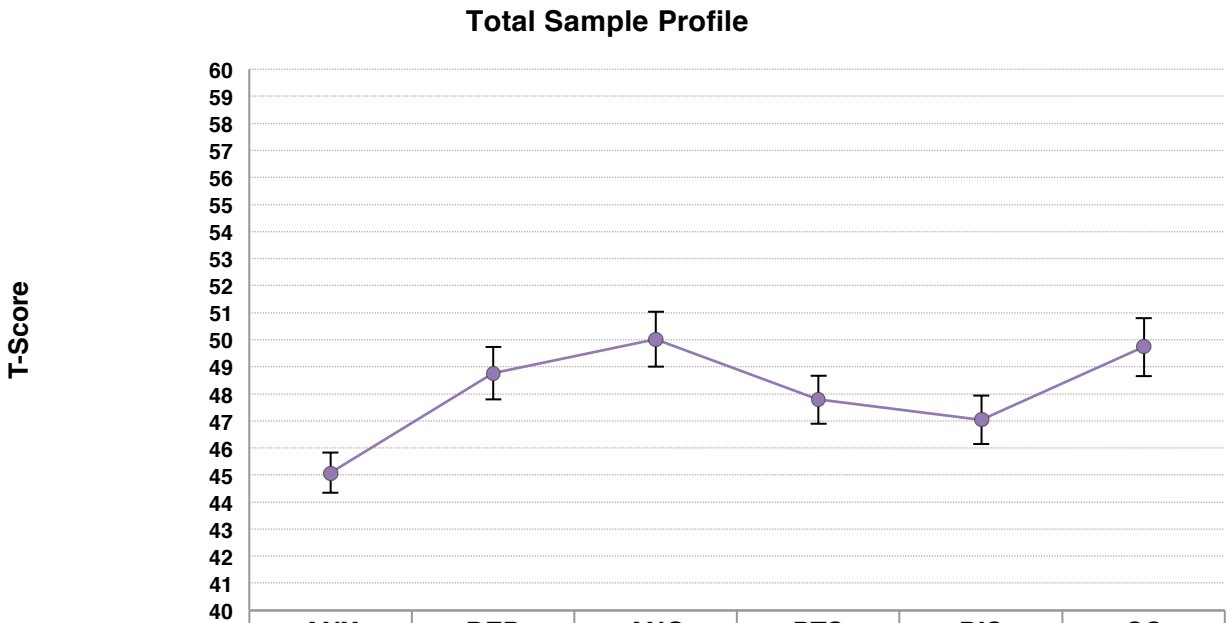
**Subscales are in italics*

Table 4.3.2.

Descriptive Statistics for TSCC Scales by Gender

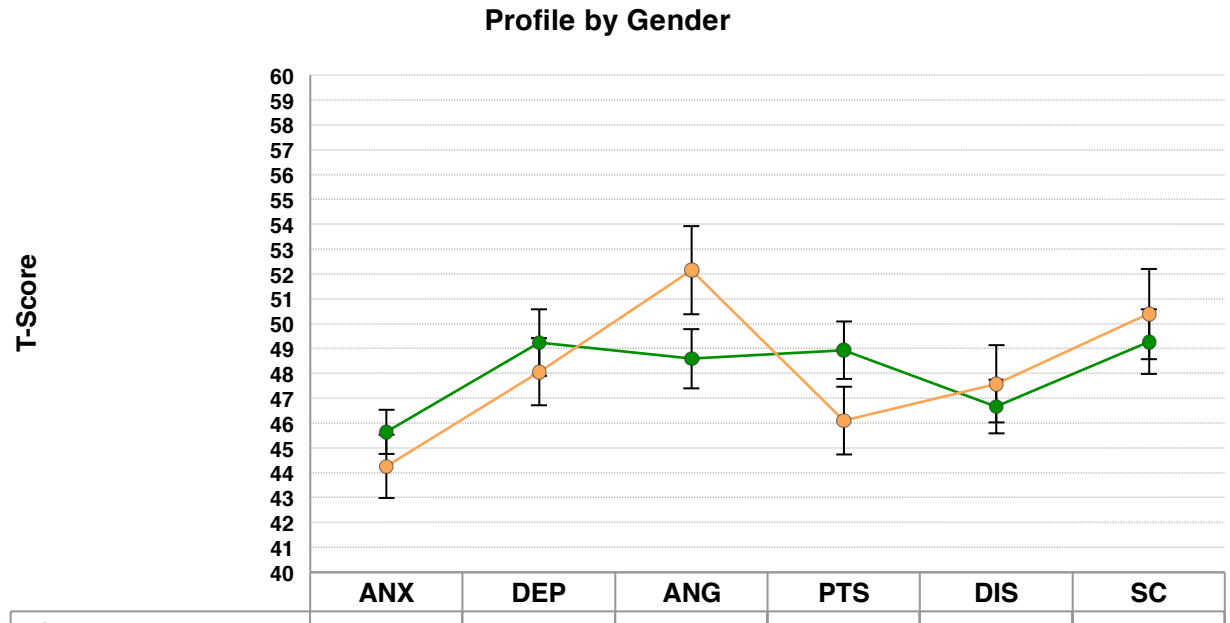
	Male Offenders *(N = 46)*				Female Offenders *(N = 31)*			
	M	*SD*	Skew.	Kurtosis	*M*	*SD*	Skew.	Kurtosis
Anxiety (ANX)	45.65	6.13	1.12	0.88	44.26	7.06	0.98	0.41
Depression (DEP)	49.24	9.12	1.26	1.15	48.06	7.52	0.68	0.04
Anger (ANG)	48.59	8.08	0.92	0.27	52.16	9.91	0.41	-0.94
Posttraumatic Stress (PTS)	48.93	7.82	1.03	0.74	46.10	7.59	0.76	0.20
Dissociation (DIS)	46.67	7.33	1.18	1.10	47.58	8.66	0.52	-0.68
DIS-O	47.20	7.65	1.66	3.04	48.23	8.82	0.51	-0.29
DIS-F	46.48	6.32	1.24	1.73	46.48	8.77	0.68	-0.06
Sexual Concerns (SC)	49.28	8.90	0.63	-0.74	50.39	10.15	0.40	-0.52
SC-P	49.48	8.55	0.76	-0.56	48.61	8.04	0.69	0.92
SC-D	48.87	9.21	1.93	2.88	55.97	16.35	0.73	-0.92

**Subscales are in italics*



	ANX	DEP	ANG	PTS	DIS	SC
Total Sample	45.09	48.77	50.03	47.79	47.04	49.73

** Error bars demarcate standard error of measurement (SEM) for each variable*



	ANX	DEP	ANG	PTS	DIS	SC
Male Offenders	45.65	49.24	48.59	48.93	46.67	49.28
Female Offenders	44.26	48.06	52.16	46.1	47.58	50.39

** Error bars demarcate standard error of measurement (SEM) for each variable*

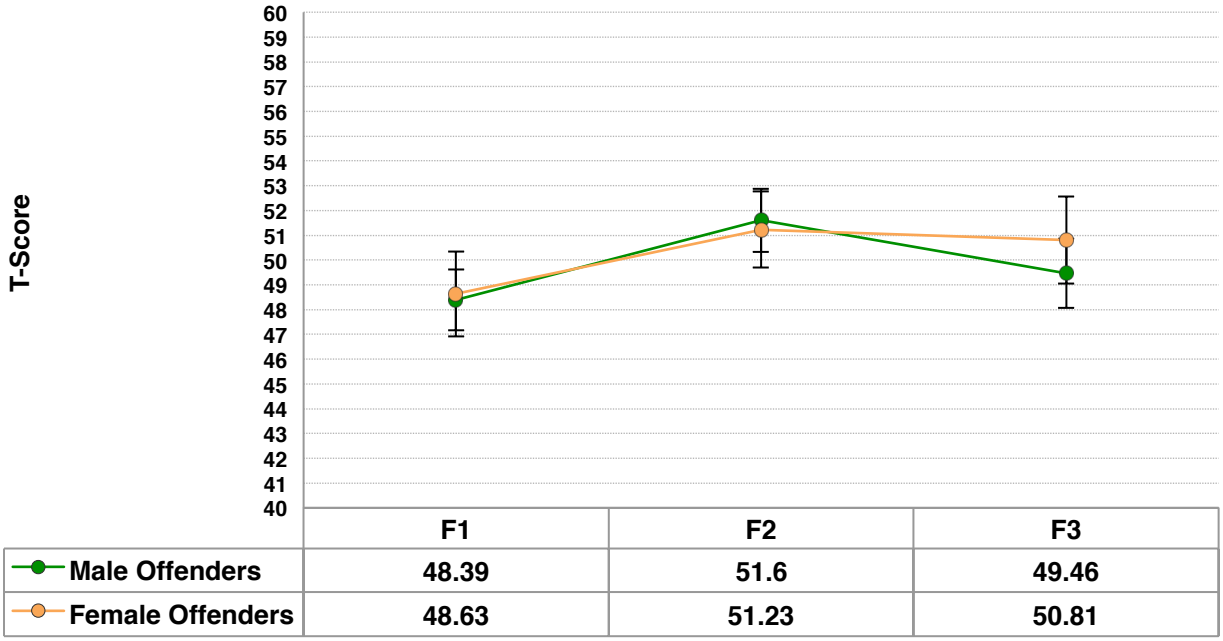
Figure 4.2.1. *TSCC Scale Profile: Total Sample and by Gender*

Table 4.3.3.

Descriptive Statistics for CROPS 3–Factor by Gender

	Male Offenders *(N = 46)*				Female Offenders *(N = 31)*			
	M	*SD*	Skew.	Kurtosis	*M*	*SD*	Skew.	Kurtosis
Affective Symptoms (F1)	48.39	10.81	-1.17	1.65	48.63	9.53	-0.14	-1.16
Somatic/Dissociative (F2)	51.60	8.61	-0.45	-0.42	51.23	8.51	-0.21	-0.54
Avoidance Reactions (F3)	49.46	9.53	-0.10	-1.09	50.81	9.83	-0.18	-0.76

**Means are T-Scores calculated using CROPS 3–Factor descriptive data excerpted from Edner et al., (2017)*



** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 4.2.2. *CROPS 3–Factor Profile by Gender*

Table 4.4.1.

CROPS 3–Factor Reliability for Total Sample

CROPS Subscales	Number of Items	Cronbach's Alpha	Spearman-Brown Coefficient	Guttman Split-Half Coefficient
Factor One (Affective Symptoms)	14	.83	.84	.84
Factor Two (Somatic/Dissociative)	6	.77	.74	.74
Factor Three (Avoidance Reactions)	4	.71	.68	.68

Table 4.4.2.

CROPS 3–Factor Reliability by Gender and Group

CROPS Subscales	Sample Subset	Cronbach's Alpha Coefficient	Spearman-Brown Coefficient	Guttman Split-Half Coefficient
Factor One (14 Items)	Male Offenders	.78	.82	.82
	Female Offenders	.87	.85	.85
	Reported Trauma	.81	.79	.79
	No Reported Trauma	.86	.89	.89
Factor Two (6 Items)	Male Offenders	.76	.71	.71
	Female Offenders	.74	.75	.74
	Reported Trauma	.79	.72	.72
	No Reported Trauma	.71	.71	.71
Factor Three (4 Items)	Male Offender	.67	.65	.65
	Female Offender	.76	.72	.72
	Reported Trauma	.76	.74	.74
	No Reported Trauma	.58	.51	.51

Table 4.4.3.

Item Reliability of the 14-Item Factor by Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I find it hard to concentrate.”	.82	.78	.85	.79	.85
“I worry that bad things will happen.”	.80	.73	.85	.77	.83
“It is hard for me to go to sleep at night.”	.83	.78	.86	.81	.85
“I have bad dreams or nightmares.”	.82	.79	.86	.79	.86
“I feel all alone.”	.81	.76	.85	.78	.85
“I feel strange or different than other kids.”	.82	.76	.86	.80	.84
“I feel like there’s something wrong with me.”	.81	.76	.85	.79	.83
“I feel like it’s my fault when bad things happen.”	.82	.78	.85	.79	.85
“I’m a jinx, or bad-luck charm.”	.83	.78	.86	.80	.86
“I feel sad or depressed.”	.81	.76	.85	.79	.84
“I don’t feel like doing much.”	.82	.77	.86	.79	.85
“My future looks bad.”	.82	.77	.85	.79	.85
“I’m on lookout for bad things that may happen.”	.83	.77	.87	.81	.85
“I am nervous or jumpy.”	.82	.77	.86	.80	.85

Table 4.4.4.

Item Reliability of the 6-Item Factor by Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I daydream.”	.75	.74	.72	.76	.74
“I “space out” when people are talking to me.”	.73	.66	.74	.74	.72
“I get headaches.”	.74	.70	.73	.80	.60
“I get stomach aches.”	.71	.69	.69	.74	.66
“I feel sick or have pains.”	.70	.68	.68	.76	.60
“I feel tired or low energy.”	.70	.68	.66	.71	.68

Table 4.4.5.

Item Reliability of the 4-Item Factor by Total Sample, Gender, and Group

	Alpha Coefficients				
	Total Sample	Males	Females	Trauma	No Trauma
“I think about bad things that have happened.”	.61	.52	.72	.73	.40
“I try to forget bad things that have happened.”	.58	.49	.68	.68	.42
“I avoid reminders of bad things that happened.”	.59	.50	.68	.68	.41
“I do special things so nothing bad happens.”	.71	.70	.74	.70	.74

Table 4.5.1.

Primary Correlations of CROPS 3–Factor and TSCC Scales: Total Sample (N = 77)

	CROPS 3–Factor Subscales		
TSCC Scales	Factor One (F1)	Factor Two (F2)	Factor Three (F3)
Anxiety (ANX)	.651***	.400***	.320**
Depression (DEP)	.506***	.300**	.246*
Anger (ANG)	.363**	.160	.212
Posttraumatic Stress (PTS)	.435***	.280*	.493***
Dissociation (DIS)	.617***	.421***	.317**
Sexual Concerns (SC)	.379**	.382**	.306**

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

Table 4.5.2.

Primary Correlations of CROPS 3–Factor and TSCC Scales by Gender

	Male Offenders *(N = 46)*			Female Offenders *(N = 31)*		
TSCC Scales	F1	F2	F3	F1	F2	F3
Anxiety (ANX)	.609*	.379**	.174	.787***	.542**	.495**
Depression (DEP)	.569***	.346*	.318*	.523**	.332	.145
Anger (ANG)	.324*	-.070	.416**	.343	.296	-.005
Posttraumatic Stress (PTS)	.393**	.254	.395**	.632***	.498**	.658***
Dissociation (DIS)	.667***	.339*	.275	.577***	.521**	.363*
Sexual Concerns (SC)	.175	.293*	.156	.582***	.486**	.477**

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

Table 4.5.3.

Primary Correlations of CROPS 3–Factor and TSCC Scales by Group

	Trauma Group *(N = 43)*			No Trauma Group *(N = 34)*		
TSCC Scales	F1	F2	F3	F1	F2	F3
Anxiety (ANX)	.503***	.341*	.312*	.777***	.475**	.355*
Depression (DEP)	.360*	.185	.143	.668***	.457**	.420*
Anger (ANG)	.348*	.064	.354*	.360*	.269	.031
Posttraumatic Stress (PTS)	.450**	.363*	.532***	.411*	.110	.435*
Dissociation (DIS)	.574***	.510***	.296	.677***	.300	.356*
Sexual Concerns (SC)	.306*	.396**	.395**	.432**	.362*	.209

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

Table 4.6.1.

Full Correlation Matrix of CROPS 3–Factor and TSCC: Combined Gender (N = 77)

Scale[1]	F1	F2	F3	ANX	DEP	ANG	PTS	DIS	DIS-O	DIS-F	SC	SC-P
F1	1											
F2	.571***	1										
F3	.408***	.201	1									
ANX	.651***	.400***	.320**	1								
DEP	.506***	.300**	.246*	.644***	1							
ANG	.363**	.160	.212	.283*	.419***	1						
PTS	.435***	.280*	.493***	.678***	.460***	.273*	1					
DIS	.617***	.421***	.317**	.639***	.637***	.425***	.598***	1				
DIS-O+	.675***	.441***	.322**	.641***	.659***	.331**	.585***	.924***	1			
DIS-F+	.348**	.182	.235*	.412***	.353**	.418***	.407***	.692***	.469***	1		
SC	.379**	.382**	.306**	.420***	.255*	.205	.419***	.315**	.293	.216	1	
SC-P+	.249*	.234*	.248*	.294**	.186	.166	.296**	.155	.131	.174	.908***	1
SC-D+	.436***	.455***	.353**	.434***	.188	.086	.360**	.295**	.330	.090	.693***	.407***

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

[1] *Scales F1 – F3 comprise the CROPS 3–Factor. Scales ANX – SC-D comprise the TSCC. Scale abbreviations are as follows: F1 = Factor One; F2 = Factor Two; F3 = Factor Three; ANX = Anxiety; DEP = Depression; ANG = Anger; PTS = Posttraumatic Stress; DIS = Dissociation; and SC = Sexual Concerns.*

[+] *Subscales that are aggregated to form a primary scale. The Dissociation scale is comprised of the DIS-O (Dissociation Overt) and DIS-F (Dissociation Fantasy) subscales. The Sexual Concerns scale is comprised of SC-P (Sexual Concerns Preoccupation) and SC-D (Sexual Concerns Dissociation) subscales.*

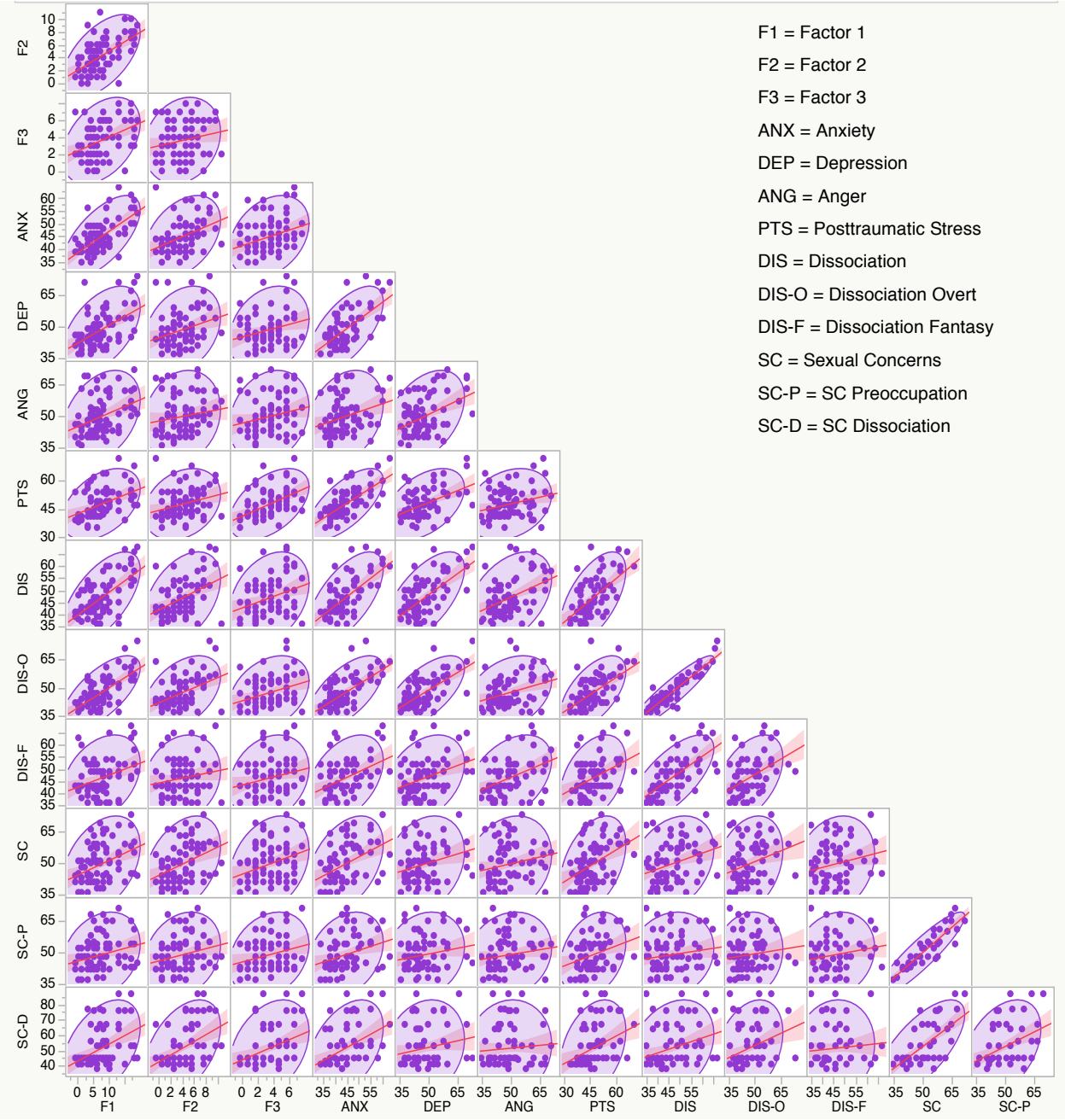


Figure 4.3.1. *Scatterplot Matrix of CROPS 3–Factor and TSCC: Combined Gender (N = 77)*

Table 4.6.2.

Full Correlation Matrix of CROPS 3–Factor and TSCC: Male Offenders (N = 46)

Scale[1]	F1	F2	F3	ANX	DEP	ANG	PTS	DIS	DIS-O	DIS-F	SC	SC-P
F1	**1**											
F2	.454***	1										
F3	.318**	.104	1									
ANX	.609*	.379**	.174	1								
DEP	.569***	.346*	.318*	.662***	1							
ANG	.324*	-.070	.416**	.213	.363*	1						
PTS	.393**	.254	.395**	.657***	.481**	.298	1					
DIS	.667***	.339*	.275	.614***	.663***	.389**	.565***	1				
DIS-O+	.700***	.359*	.295*	.699***	.712***	.289	.584***	.921***	1			
DIS-F+	.454**	.141	.300*	.272	.364*	.561***	.432**	.703***	.514***	1		
SC	.175	.293*	.156	.328*	.251	.215	.416**	.253	.212	.290	1	
SC-P+	.135	.246	.157	.227	.172	.210	.362*	.213	.177	.306*	.957***	1
SC-D+	.105	.254	.085	.460**	.243	.041	.291*	.144	.211	-.020	.560***	.358

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

[1] *Scales F1 – F3 comprise the CROPS 3–Factor. Scales ANX – SC-D comprise the TSCC. Scale abbreviations are as follows: F1 = Factor One; F2 = Factor Two; F3 = Factor Three; ANX = Anxiety; DEP = Depression; ANG = Anger; PTS = Posttraumatic Stress; DIS = Dissociation; and SC = Sexual Concerns.*

[+] *Subscales that are aggregated to form a primary scale. The Dissociation scale is comprised of the DIS-O (Dissociation Overt) and DIS-F (Dissociation Fantasy) subscales. The Sexual Concerns scale is comprised of SC-P (Sexual Concerns Preoccupation) and SC-D (Sexual Concerns Dissociation) subscales*

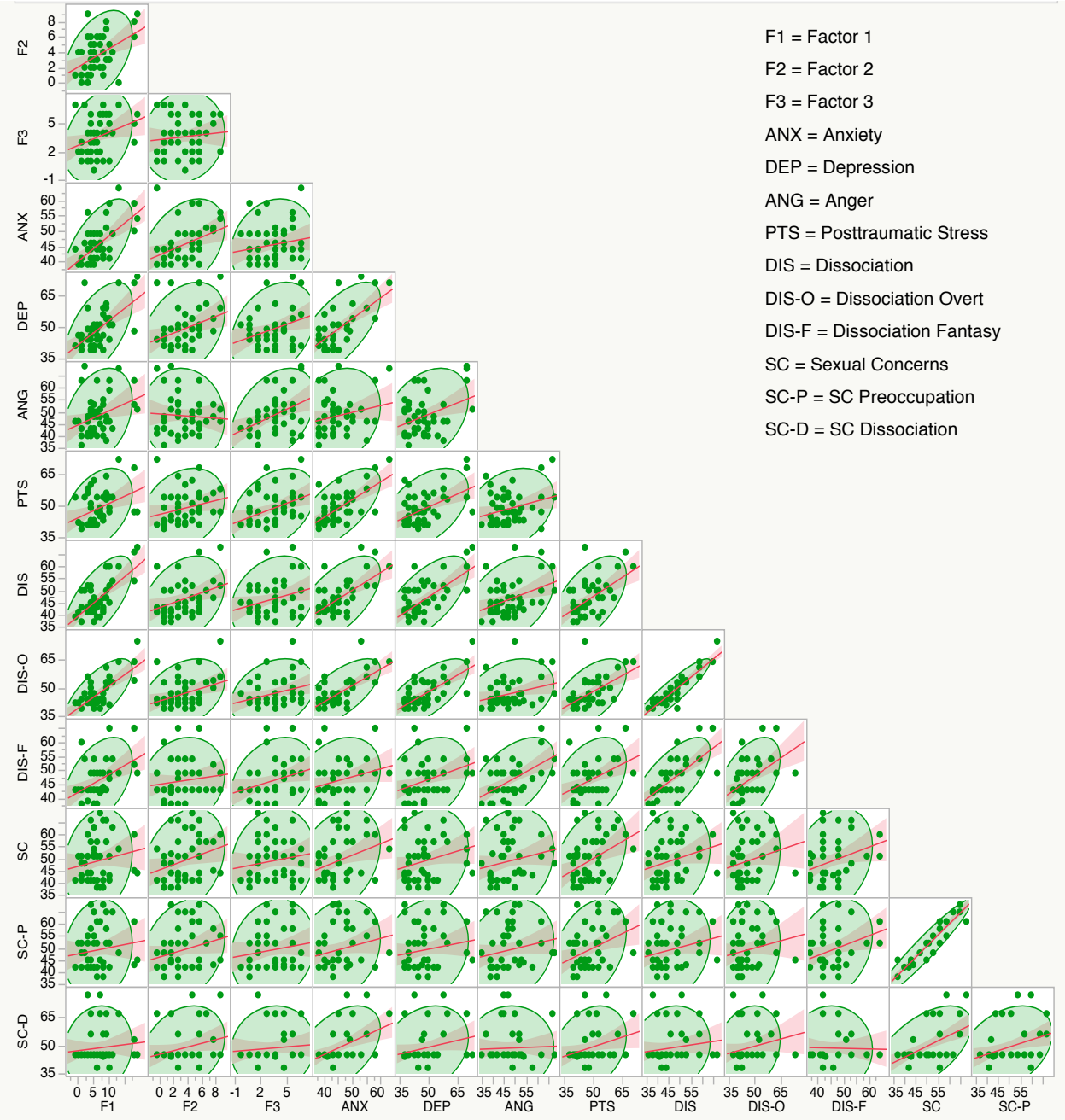


Figure 4.3.2. *Scatterplot Matrix of CROPS 3–Factor and TSCC: Male Offenders (N = 46)*

Table 4.6.3.

Full Correlation Matrix of CROPS 3–Factor and TSCC: Female Offenders (N = 31)

Scale[1]	F1	F2	F3	ANX	DEP	ANG	PTS	DIS	DIS-O	DIS-F	SC	SC-P
F1	1											
F2	.632***	1										
F3	.513***	.321	1									
ANX	.787***	.542**	.495**	1								
DEP	.523**	.332	.145	.631***	1							
ANG	.343	.296	-.005	.416*	.581***	1						
PTS	.632***	.498**	.658***	.702***	.413*	.351	1					
DIS	.577***	.521**	.363*	.688***	.638***	.458**	.696***	1				
DIS-O+	.661***	.539**	.351	.600***	.617***	.365*	.644***	.926***	1			
DIS-F+	.277	.240	.177	.551***	.368*	.309	.407*	.688***	.433*	1		
SC	.582***	.486**	.477**	.544**	.284	.180	.468**	.378*	.380*	.149	1	
SC-P+	.440*	.286	.381*	.381*	.205	.143	.178	.087	.079	.029	.862***	1
SC-D+	.601***	.539**	.580***	.520**	.219	.031	.591***	.407*	.422*	.166	.842***	.552***

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

[1] *Scales F1 – F3 comprise the CROPS 3–Factor. Scales ANX – SC-D comprise the TSCC. Scale abbreviations are as follows: F1 = Factor One; F2 = Factor Two; F3 = Factor Three; ANX = Anxiety; DEP = Depression; ANG = Anger; PTS = Posttraumatic Stress; DIS = Dissociation; and SC = Sexual Concerns.*

[+] *Subscales that are aggregated to form a primary scale. The Dissociation scale is comprised of the DIS-O (Dissociation Overt) and DIS-F (Dissociation Fantasy) subscales. The Sexual Concerns scale is comprised of SC-P (Sexual Concerns Preoccupation) and SC-D (Sexual Concerns Dissociation) subscale*

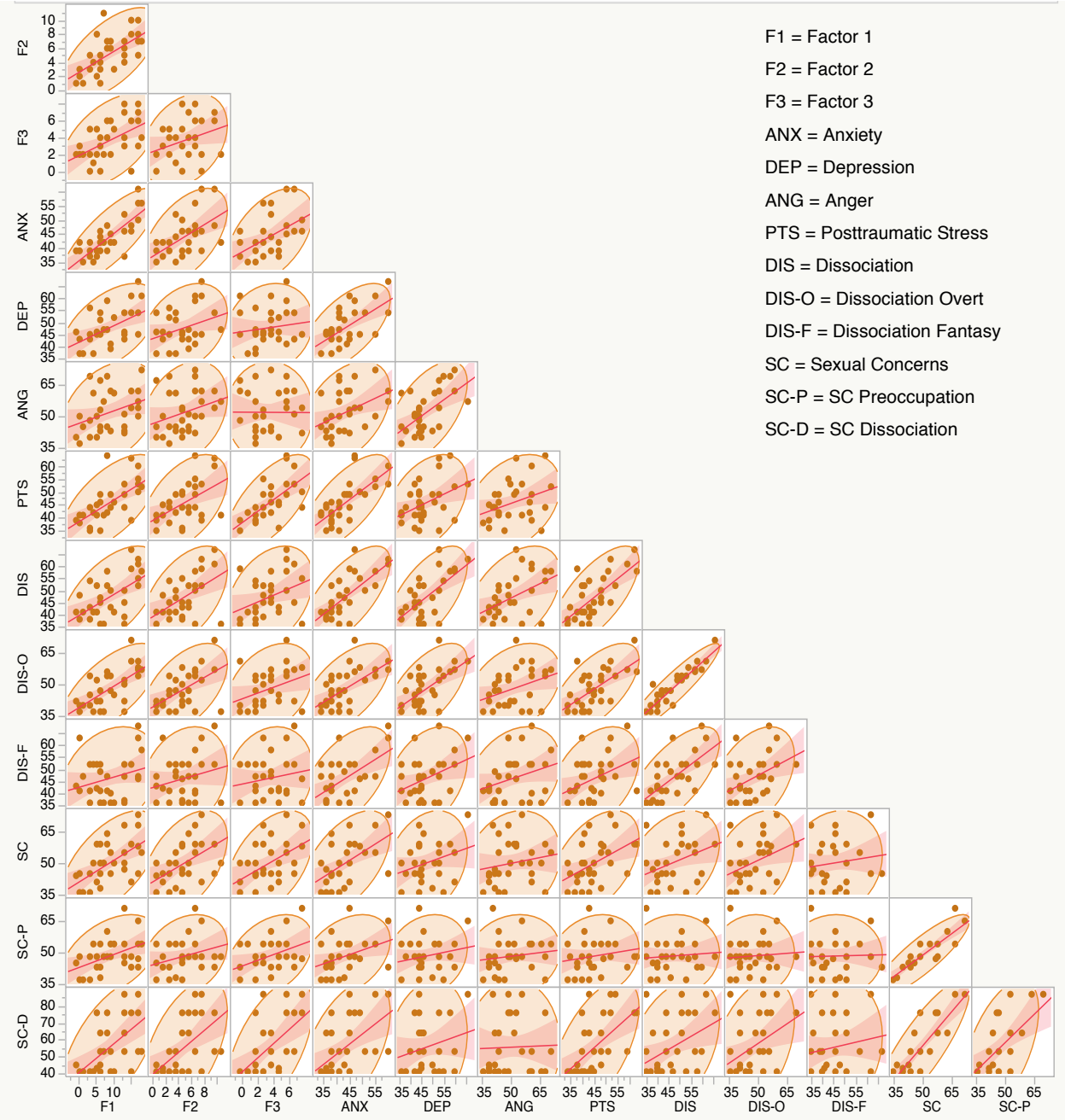


Figure 4.3.3. *Scatterplot Matrix of CROPS 3–Factor and TSCC: Female Offenders (N = 31)*

Table 4.6.4.

Full Correlation Matrix of CROPS 3–Factor and TSCC: No Trauma Group (N = 34)

Scale[1]	F1	F2	F3	ANX	DEP	ANG	PTS	DIS	DIS-O	DIS-F	SC	SC-P
F1	1											
F2	.657***	1										
F3	.323	.186	1									
ANX	.777***	.475**	.355*	1								
DEP	.668***	.457**	.420*	.663***	1							
ANG	.360*	.269	.031	.214	.312	1						
PTS	.411*	.110	.435*	.557***	.320	.069	1					
DIS	.677***	.300	.356*	.666***	.692***	.386*	.524**	1				
DIS-O+	.716***	.330	.431*	.708***	.756***	.276	.568***	.933***	1			
DIS-F+	.468**	.103	.288	.415*	.437**	.626***	.420*	.715***	.570***	1		
SC	.432*	.362*	.209	.595***	.328	.296	.449**	.307	.265	.364	1	
SC-P+	.305	.273	.267	.447**	.329	.326	.411*	.277	.229	.397	.947***	1
SC-D+	.560***	.436**	.126	.729***	.296	.145	.427*	.300	.300	.236	.805***	.588***

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

[1] *Scales F1 – F3 comprise the CROPS 3–Factor. Scales ANX – SC-D comprise the TSCC. Scale abbreviations are as follows: F1 = Factor One; F2 = Factor Two; F3 = Factor Three; ANX = Anxiety; DEP = Depression; ANG = Anger; PTS = Posttraumatic Stress; DIS = Dissociation; and SC = Sexual Concerns.*

[+] *Subscales that are aggregated to form a primary scale. The Dissociation scale is comprised of the DIS-O (Dissociation Overt) and DIS-F (Dissociation Fantasy) subscales. The Sexual Concerns scale is comprised of SC-P (Sexual Concerns Preoccupation) and SC-D (Sexual Concerns Dissociation) subscales.*

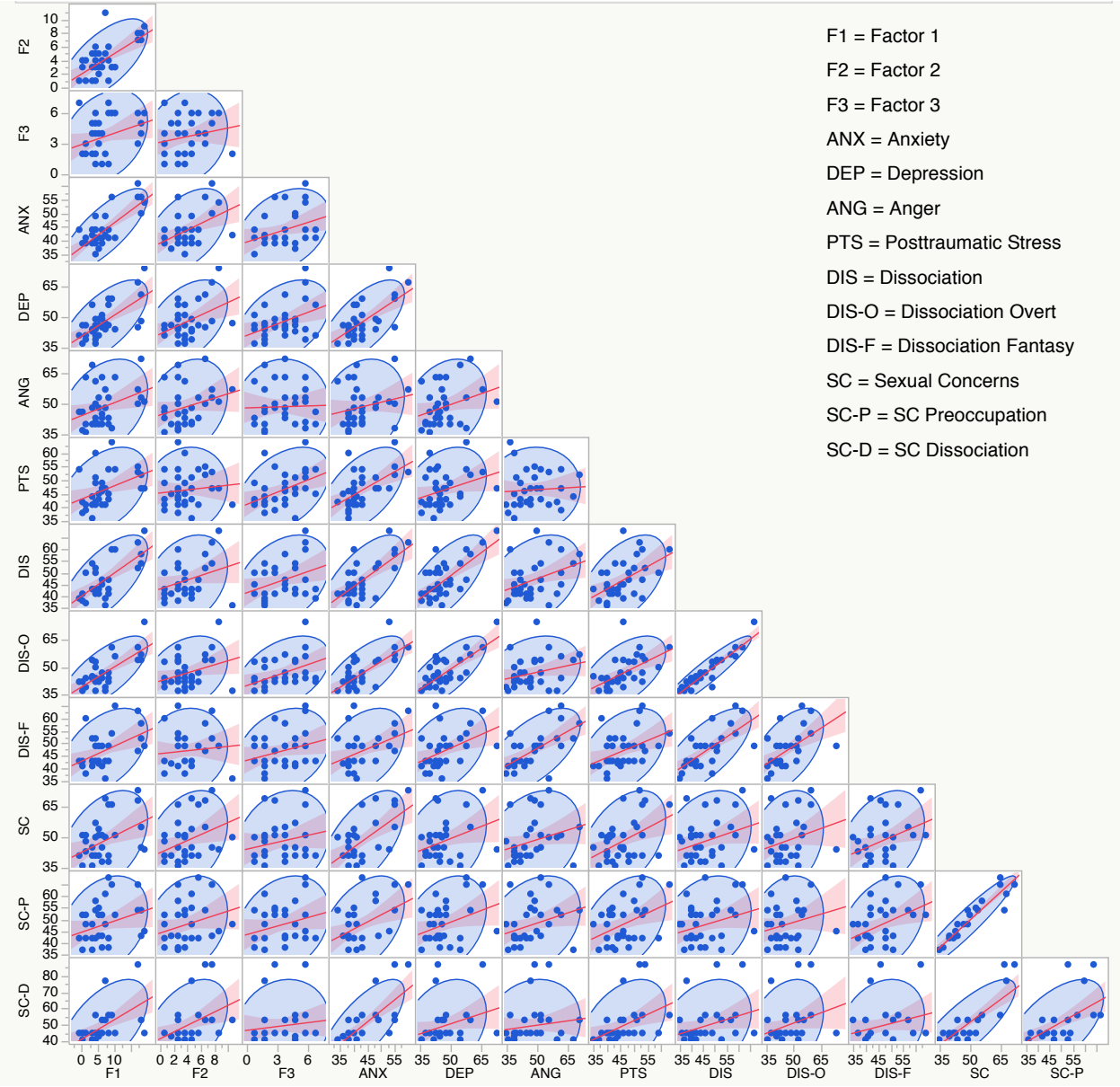


Figure 4.3.4. *Scatterplot Matrix of CROPS 3–Factor and TSCC: Non-Trauma Group (N = 34)*

Table 4.6.5.

Full Correlation Matrix of CROPS 3–Factor and TSCC: Trauma Group (N = 43)

Scale[1]	F1	F2	F3	ANX	DEP	ANG	PTS	DIS	DIS-O	DIS-F	SC	SC-P
F1	1											
F2	.503***	1										
F3	.487***	.213	1									
ANX	.537***	.341*	.312*	1								
DEP	.360*	.185	.143	.625***	1							
ANG	.347*	.064	.354*	.318*	.503***	1						
PTS	.450**	.363*	.532***	.742***	.537***	.395**	1					
DIS	.574***	.510***	.295	.634***	.599***	.468**	.660***	1				
DIS-O+	.635***	.521***	.256	.589***	.579***	.375*	.606***	.920***	1			
DIS-F+	.285	.246	.204	.450**	.314*	.287	.432**	.683***	.412**	1		
SC	.306*	.396**	.395**	.250	.179	.088	.399**	.328*	.311*	.125	1	
SC-P+	.180	.196	.245	.153	.057	-.001	.217	.055	.036	.031	.871***	1
SC-D+	.336*	.461**	.485***	.231	.105	.017	.311*	.299	.346*	.027	.615***	.272

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

[1] *Scales F1 – F3 comprise the CROPS 3–Factor. Scales ANX – SC-D comprise the TSCC. Scale abbreviations are as follows: F1 = Factor One; F2 = Factor Two; F3 = Factor Three; ANX = Anxiety; DEP = Depression; ANG = Anger; PTS = Posttraumatic Stress; DIS = Dissociation; and SC = Sexual Concerns.*

[+] *Subscales that are aggregated to form a primary scale. The Dissociation scale is comprised of the DIS-O (Dissociation Overt) and DIS-F (Dissociation Fantasy) subscales. The Sexual Concerns scale is comprised of SC-P (Sexual Concerns Preoccupation) and SC-D (Sexual Concerns Dissociation) subscales.*



Figure 4.3.5. *Scatterplot Matrix of CROPS 3–Factor and TSCC: Trauma Group (N = 43)*

APPENDIX B

INCLUDED AND OMITTED ITEMS FROM THE BASC-2-SRP-A

BASC-2 Atypicality Subscale

Included Items

- 62. Sometimes, when alone, I hear my name
- 92. I feel like people are out to get me
- 100. Someone wants to hurt me
- 119. Even when alone, I feel like someone is watching me
- 130. I see weird things
- 152. I do things over and over and can't stop
- 160. I hear things that others cannot hear

Omitted Items

- 122. I hear voices in my head that no one else can hear
- 149. Someone else controls my thoughts

BASC-2 Locus of Control Subscale

Included Items

- 6. Things go wrong for me, even when I try hard
- 19. What I want never seems to matter
- 36. My parents have too much control over my life
- 66. My parents blame too many of their problems on me
- 79. I get blamed for things I can't help
- 139. I am blamed for things I don't do
- 169. People get mad at me, even when I don't do anything wrong

Omitted Items

- 49. My parents are always telling me what to do
- 109. My parents expect too much from me

BASC-2 Social Stress Subscale

Included Items

- 26. My friends have more fun than I do
- 56. Other children are happier than I am
- 75. People say bad things to me
- 86. People act as if they don't hear me
- 105. I am lonely
- 116. I am left out of things
- 135. Other people find things wrong with me
- 146. I feel out of place around people
- 165. I feel that others do not like the way I do things
- 176. Other people are against me

Omitted Items

- **None**

BASC-2 Anxiety Subscale

Included Items

- 11. I can never seem to relax
- 41. I worry a lot of the time
- 50. I often worry about something bad happening to me
- 71. I get so nervous I can't breathe
- 80. I worry when I go to bed at night
- 101. I feel guilty about things
- 108. I get nervous
- 110. I worry but I don't know why
- 131. I get nervous when things do not go the right way for me
- 138. Little things bother me
- 140. I worry about what is going to happen

Omitted Items

- 20. I worry about little things
- 170. I am afraid of a lot of things

BASC-2 Depression Subscales

Included Items

- 8. I used to be happier
- 38. I just don't care anymore
- 51. I don't seem to do anything right
- 63. Nothing ever goes right for me
- 68. Nothing about me is right
- 81. I feel like my life is getting worse and worse
- 93. I feel depressed
- 98. No one understands me
- 111. I feel sad

Omitted Items

- 3. Nothing goes my way
- 21. Nothing is fun anymore
- 33. Nobody ever listens to me

BASC-2 Sense of Inadequacy Subscale

Included Items

- 24. I never seem to get anything right

- 54. Most things are harder for me than for others
- 60. I never quite reach my goal
- 84. Even when I try hard, I fail
- 90. I am disappointed with my grades
- 114. When I take tests, I can't think
- 120. I want to do better, but I can't
- 144. I fail at things
- 150. I quit easily

Omitted Items

- 30. I cover up my work when the teacher walks by

BASC-2 Somatization Subscale

Included Items

- 34. Often I feel sick in my stomach
- 64. I get sick more than others
- 69. My stomach gets upset more than most people's
- 99. I feel dizzy

Omitted Items

- 4. My muscles get sore a lot
- 9. I often have headaches
- 39. Sometimes my ears hurt for no reason

BASC-2 Attention Problems Subscale

Included Items

- 5. People tell me I should pay attention
- 35. I think that I have short attention span
- 53. I have attention problems
- 113. I have trouble paying attention to the teacher
- 143. I have trouble paying attention to what I am doing

Omitted Items

- 65. I give up easily
- 83. I forget things
- 95. I listen when people are talking to me
- 125. I pay attention when someone is telling me how to do something

BASC-2 Hyperactivity Subscale

Included Items

- 88. I have trouble standing still in lines

- 118. I talk while other people are talking
- 124. I have trouble sitting still
- 134. I feel like I have to get up and move around
- 148. I talk without waiting for others to say something
- 154. People tell me to be still
- 164. People tell me that I am too noisy

Omitted Items

- **None**

APPENDIX C

MMPI-A PROFILES OF EXCLUDED K-MEANS CLUSTER SOLUTIONS

Table 5.1.

ANOVA with Brown-Forsythe Correction of Two-Cluster Solution

	K-means Two-Cluster Solution					
	Cluster One $N = 47$		Cluster Two $N = 24$			
MMPI-A Scales	M	SD	M	SD	$F(1, 69)$	η^2
Hypochondriasis (Hs)	47.47	7.11	62.21	8.39	60.40***	.47
Depression (D)	53.94	6.66	65.83	9.97	35.87***	.34
Hysteria (Hy)	47.17	8.35	59.63	11.50	27.22***	.28
Psychopathic Deviate (Pd)	54.28	7.27	68.33	12.58	35.67***	.34
Masculinity/Feminity (Mf)	42.17	10.01	58.33	13.28	33.07***	.32
Paranoia (Pa)	49.04	9.03	62.08	9.17	32.78***	.32
Psychasthenia (Pt)	44.77	7.48	63.92	9.73	84.64***	.55
Schizophrenia (Sc)	45.36	6.33	64.08	8.71	107.07***	.61
Hypomania (Ma)	49.85	8.63	57.83	11.50	10.79**	.14
Social Introversion (Si)	47.36	8.89	57.00	7.86	20.12***	.23

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

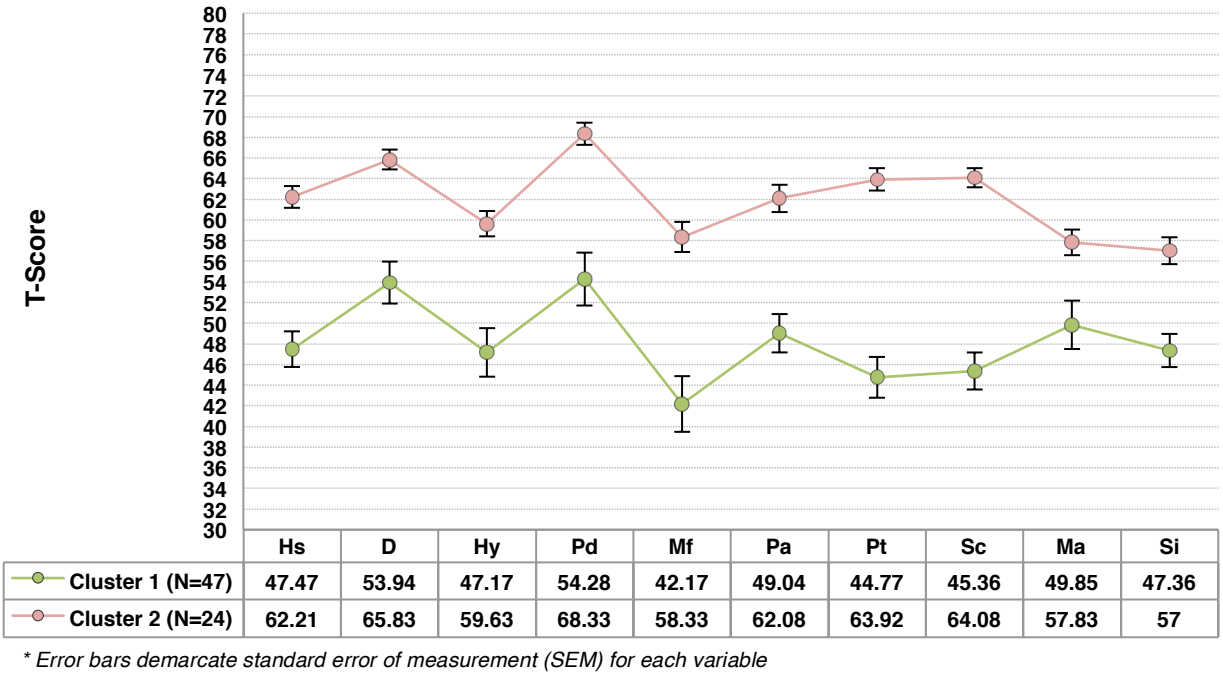
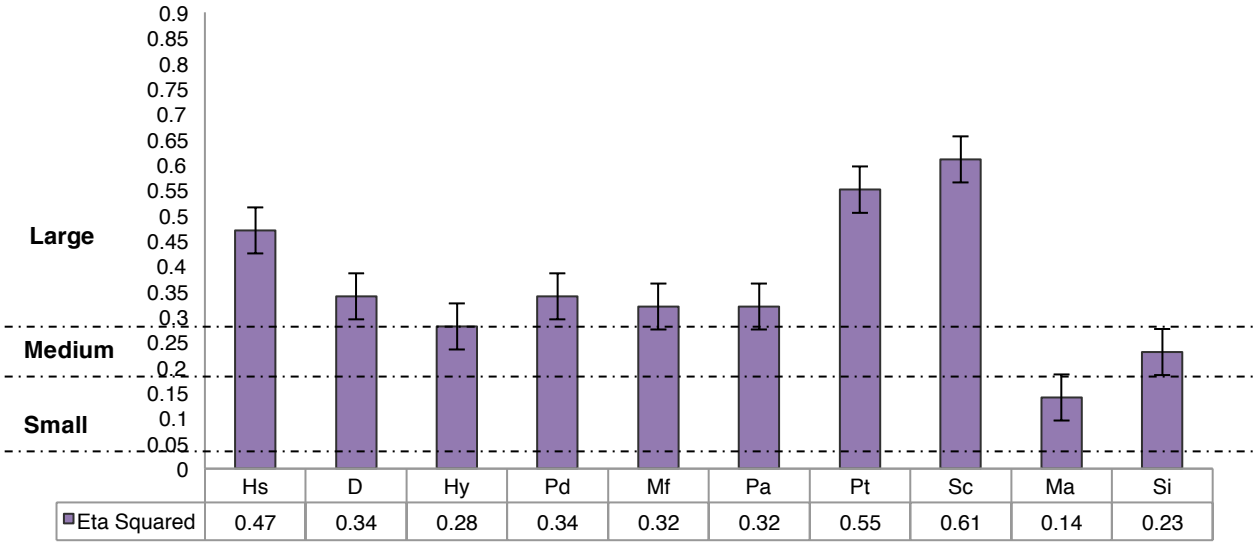


Figure 5.1.1. *MMPI-A Clinical Scale Profile of Two-Cluster Solution*



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Eta Squared	0.47	0.34	0.28	0.34	0.32	0.32	0.55	0.61	0.14	0.23

** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 5.1.2. *Magnitude of MMPI-A Scale Differences in Two-Cluster Solution*

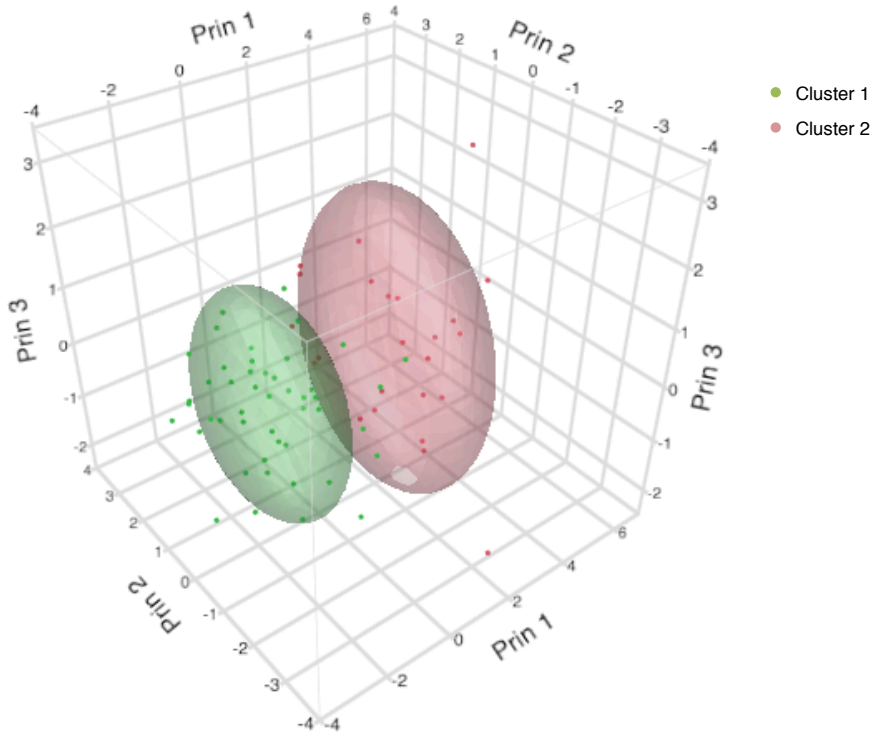


Figure 5.1.3. *Three–Dimensional Biplot of Two-Cluster Solution with MMPI-A Clinical Scales*[*]

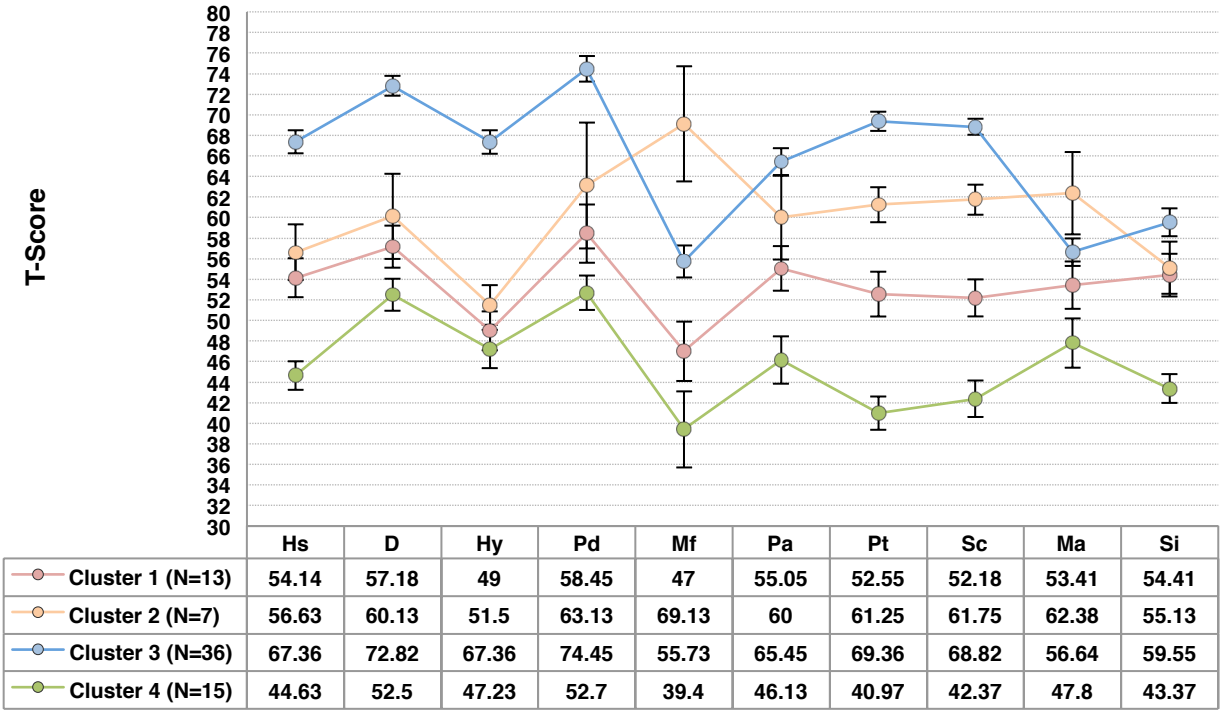
* Prin 1 = Principle Component 1
Prin 2 = Principle Component 2
Prin 3 = Principle Component 3

Table 5.2.

ANOVA with Bonferroni Post Hoc Mean Comparisons of Four-Cluster Solution

	K-means Four-Cluster Solution								
	Cluster One *N* = 13		Cluster Two *N* = 7		Cluster Three *N* = 36		Cluster Four *N* = 15		
Scale	M	SD	M	SD	M	SD	M	SD	*F*(2, 71)
Hs	54.14^{bc}	6.59	56.63^{de}	4.47	67.36^{bdf}	8.72	44.63^{cef}	6.16	33.47***
D	57.18^{b}	6.84	60.13^{de}	8.04	72.82^{bdf}	8.73	52.50^{ef}	5.89	19.38***
Hy	49.00^{b}	11.86	51.50^{d}	8.33	67.36^{bdf}	6.38	47.23^{f}	6.99	15.60***
Pd	58.45^{b}	8.12	63.13^{de}	7.62	74.45^{bdf}	14.56	52.70^{ef}	6.80	13.08***
Mf	47.00^{ac}	8.80	69.13^{de}	8.84	55.73^{df}	12.92	39.40^{cef}	9.30	20.58***
Pa	55.05^{bc}	8.88	60.00^{e}	7.87	65.45^{bf}	11.18	46.13^{cef}	7.08	14.70***
Pt	52.55^{abc}	7.20	61.25^{ae}	6.32	69.36^{bf}	10.04	40.97^{cef}	4.48	45.35***
Sc	52.18^{abc}	6.69	61.75^{ae}	6.32	68.82^{bf}	9.28	42.37^{cef}	3.83	45.04***
Ma	53.41	9.35	62.38^{e}	11.08	56.64	11.61	47.80^{e}	7.86	5.17**
Si	54.41^{c}	5.89	55.13^{e}	5.89	59.55^{f}	9.27	43.37^{cef}	7.82	18.04***

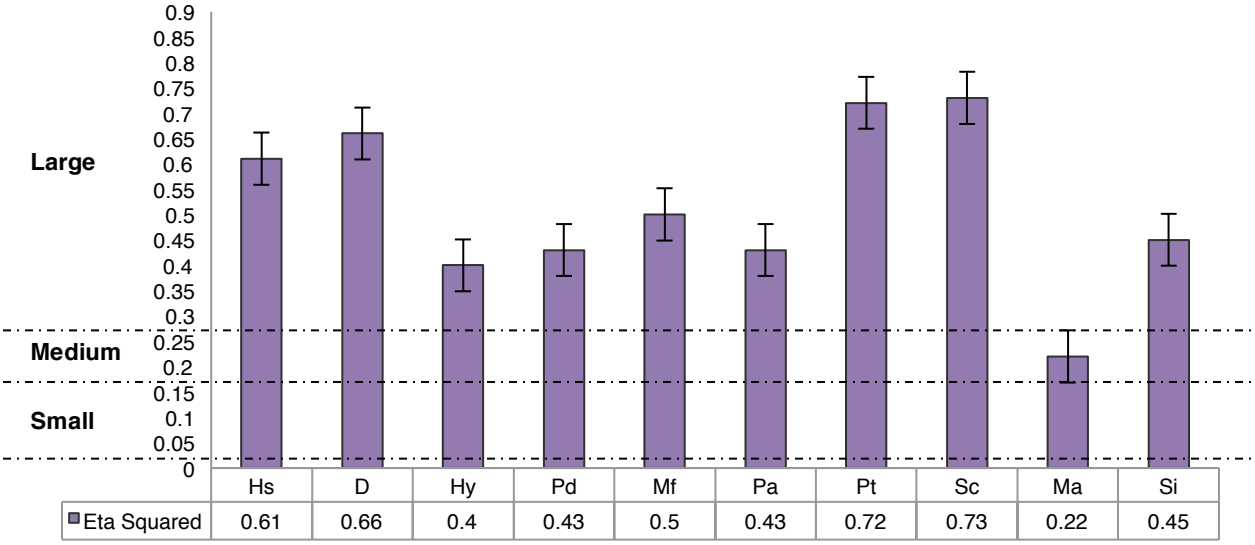
****p* < .001. *A cluster mean is statically different from another mean if they have different superscripts: a = statistical difference between Cluster 1 and Cluster 2; b = statistical difference between Cluster 1 and Cluster 3; c = statistical differences between Cluster 1 and Cluster 4; d = statistical differences between Cluster 2 and 3; e = statistical differences between Cluster 2 and Cluster 4; f = statistical differences between Cluster 3 and Cluster 4*



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Cluster 1 (N=13)	54.14	57.18	49	58.45	47	55.05	52.55	52.18	53.41	54.41
Cluster 2 (N=7)	56.63	60.13	51.5	63.13	69.13	60	61.25	61.75	62.38	55.13
Cluster 3 (N=36)	67.36	72.82	67.36	74.45	55.73	65.45	69.36	68.82	56.64	59.55
Cluster 4 (N=15)	44.63	52.5	47.23	52.7	39.4	46.13	40.97	42.37	47.8	43.37

** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 5.2.1. *MMPI-A Clinical Scale Profiles of Four-Cluster Solution*



	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Eta Squared	0.61	0.66	0.4	0.43	0.5	0.43	0.72	0.73	0.22	0.45

** Error bars demarcate standard error of measurement (SEM) for each variable*

Figure 5.2.2. *Magnitude of MMPI-A Clinical Scale Differences in Four-Cluster Solution*

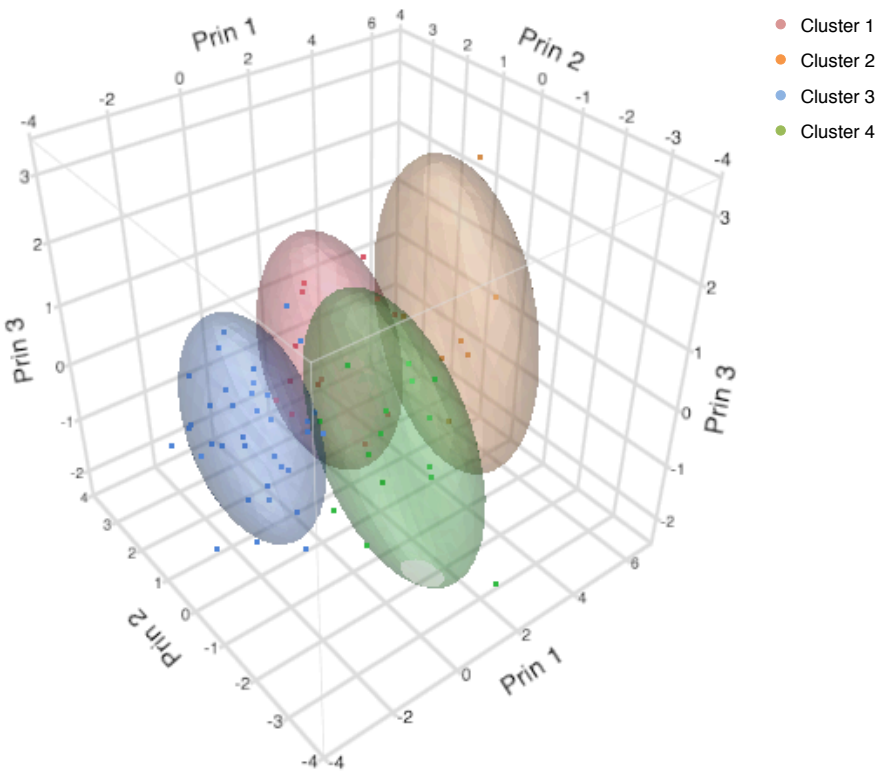


Figure 5.2.3. *Three–Dimensional Biplot of Four-Cluster Solution with MMPI-A Scales**

* Prin 1 = Principle Component 1
Prin 2 = Principle Component 2
Prin 3 = Principle Component 3

APPENDIX D

SUPPLEMENTAL DATA GRAPHICS ACROSS STUDIES *

* Area parameters of all shaded density ellipses for components, functions, and clusters throughout Appendix D were rendered with 95 percent confidence.

STUDY ONE

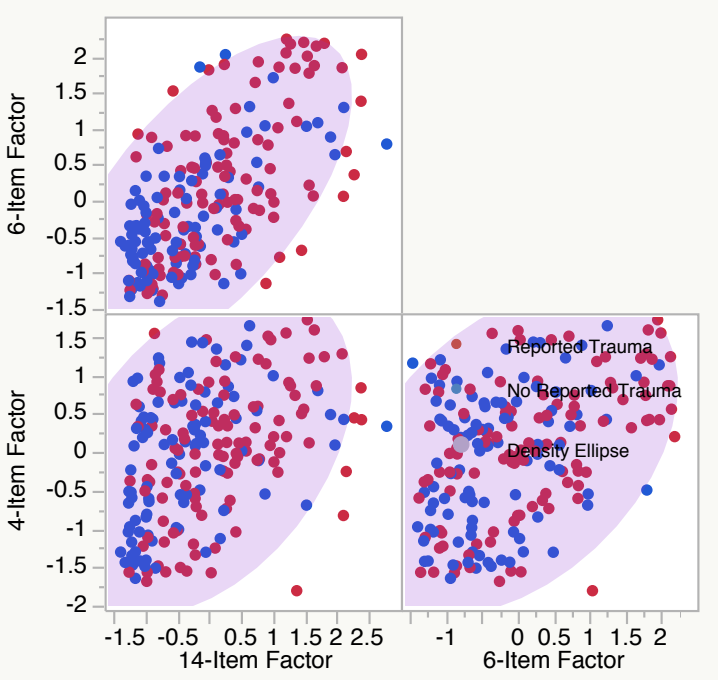


Figure 6.1.1. *Scatterplot of Principle Components for 24 Items of the CROPS*

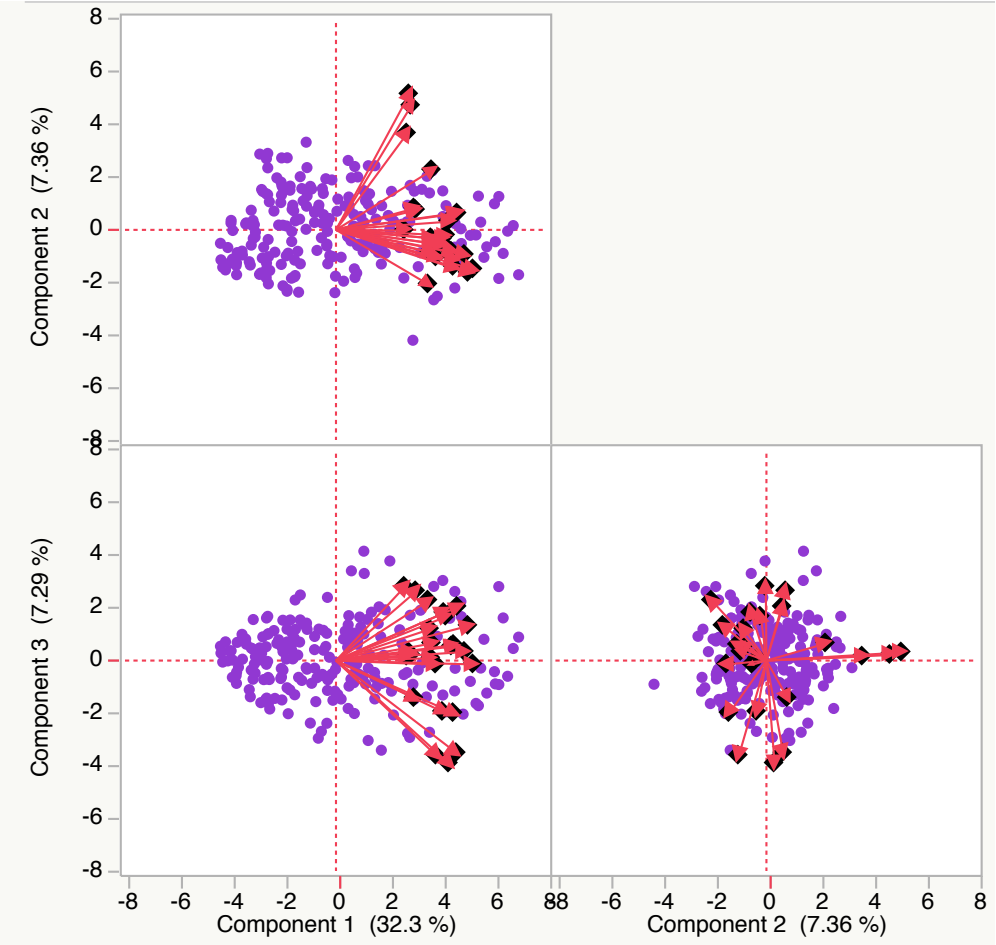


Figure 6.1.2. *Biplot of Principle Components for 24 Items of the CROPS*

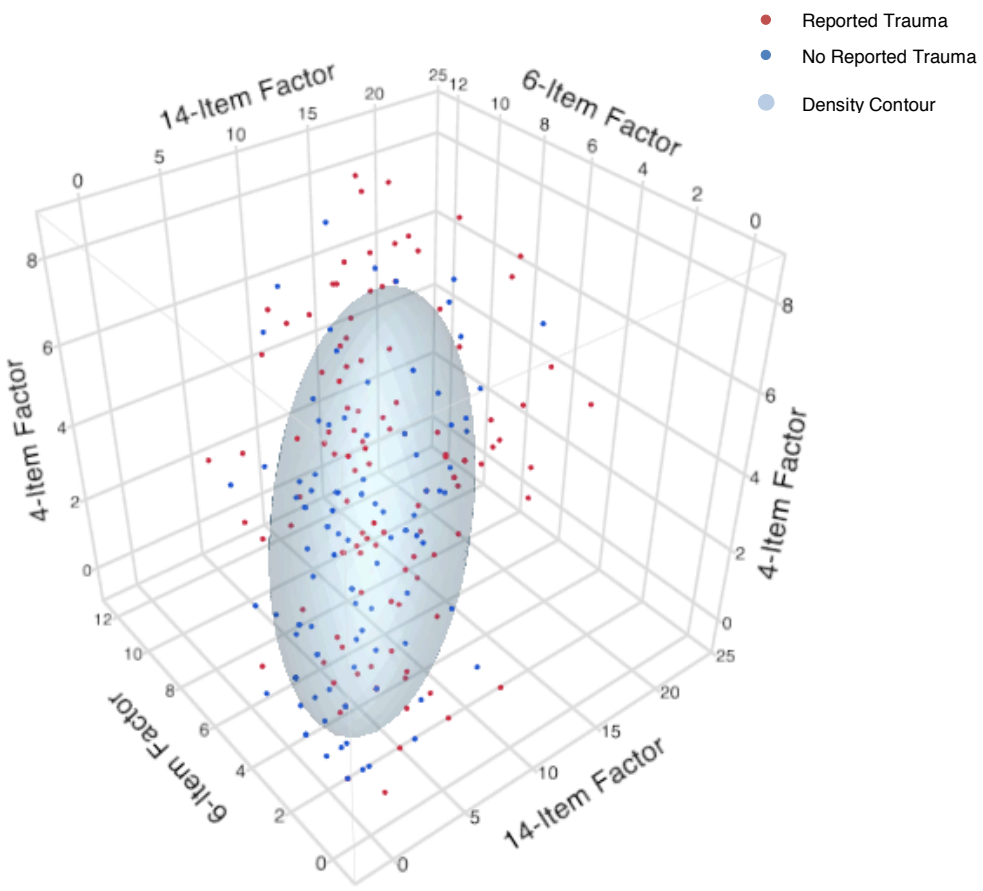


Figure 6.1.3. *Three—Dimensional Scatterplot of CROPS 3–Factor Structure*

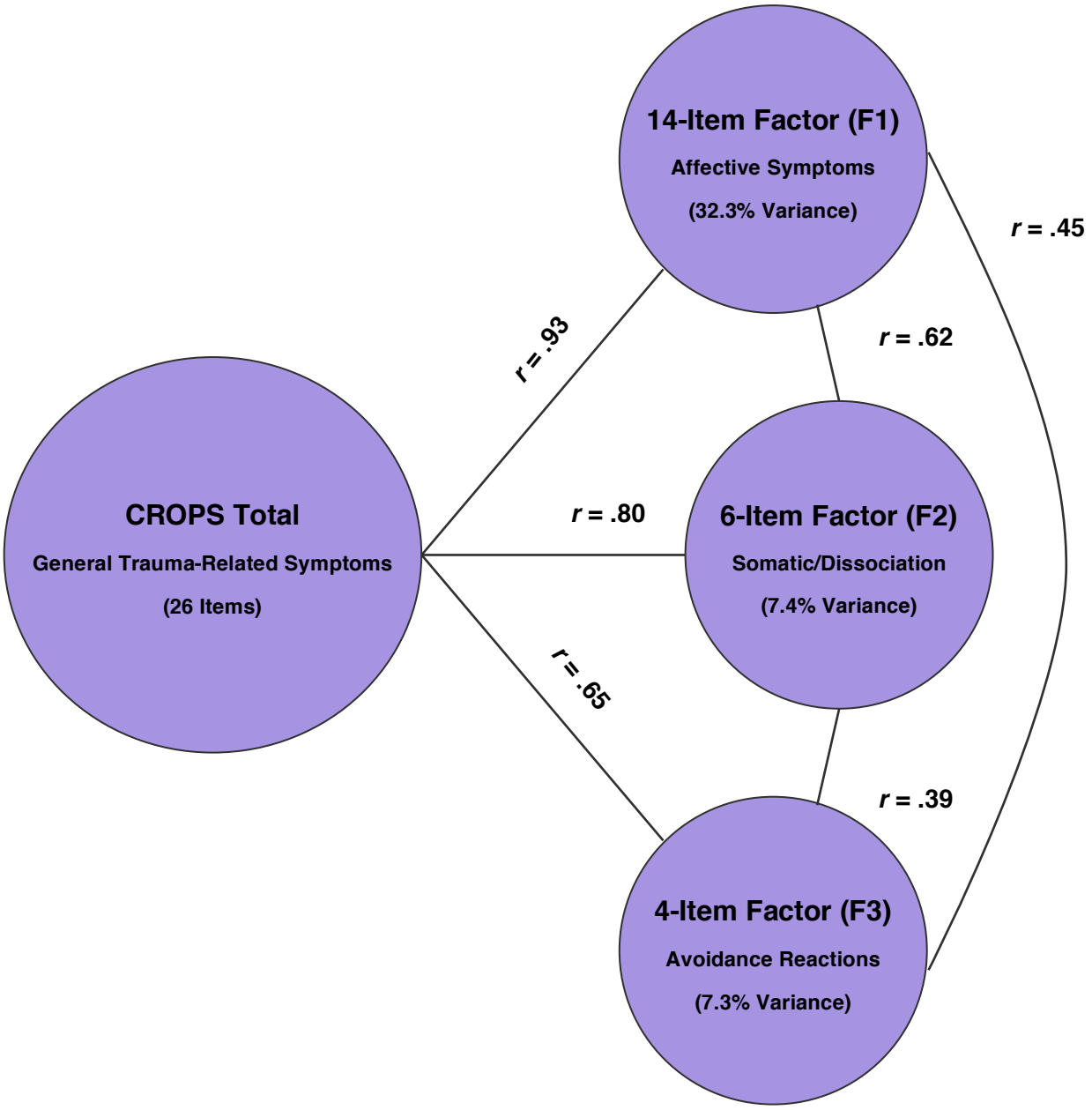


Figure 6.1.4. *Graphic Structure of CROPS 3–Factor Model*

STUDY TWO

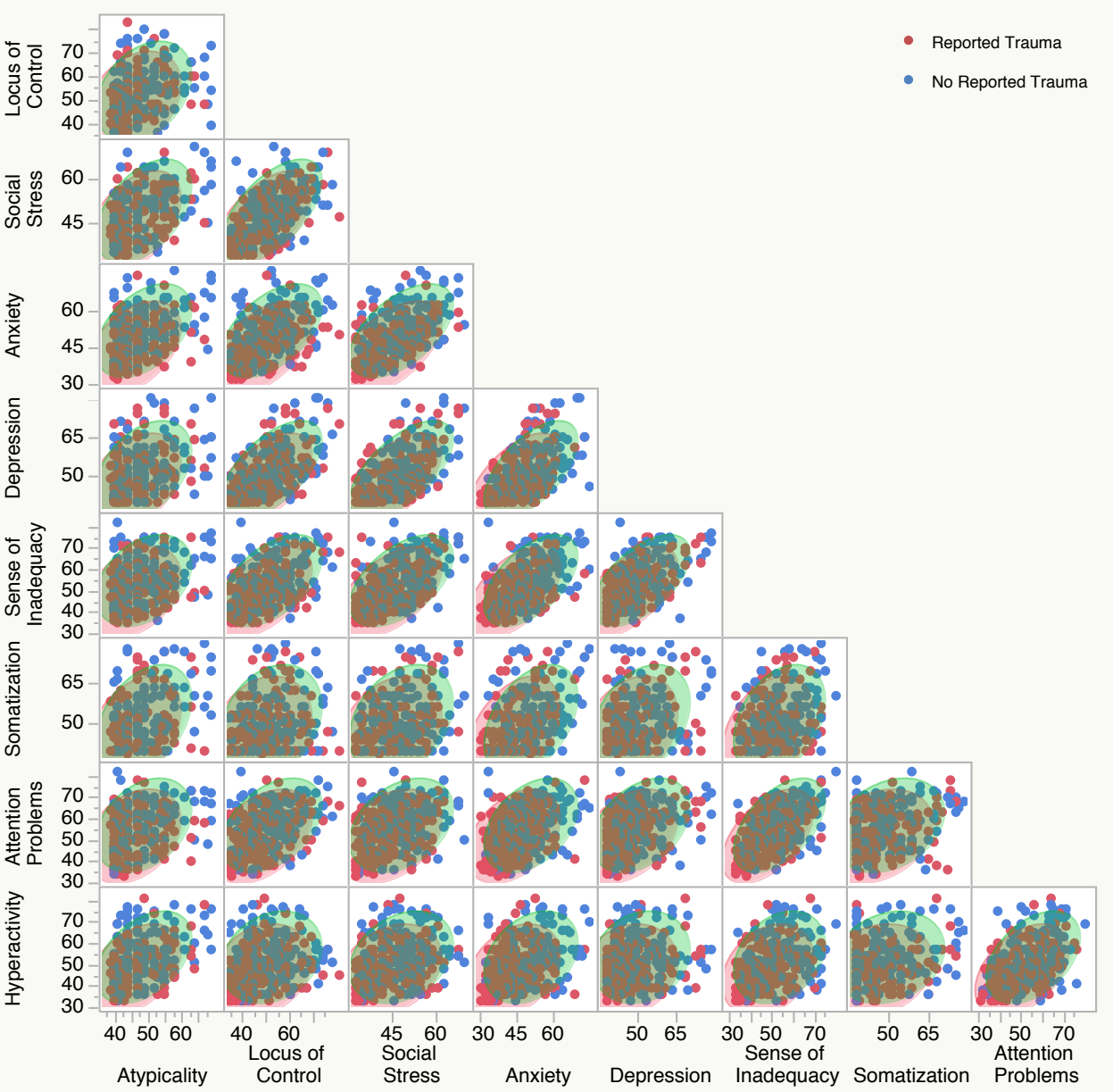


Figure 6.2.1. *Scatterplot of BASC-2 Clinical Scale Function for Combined Sample*

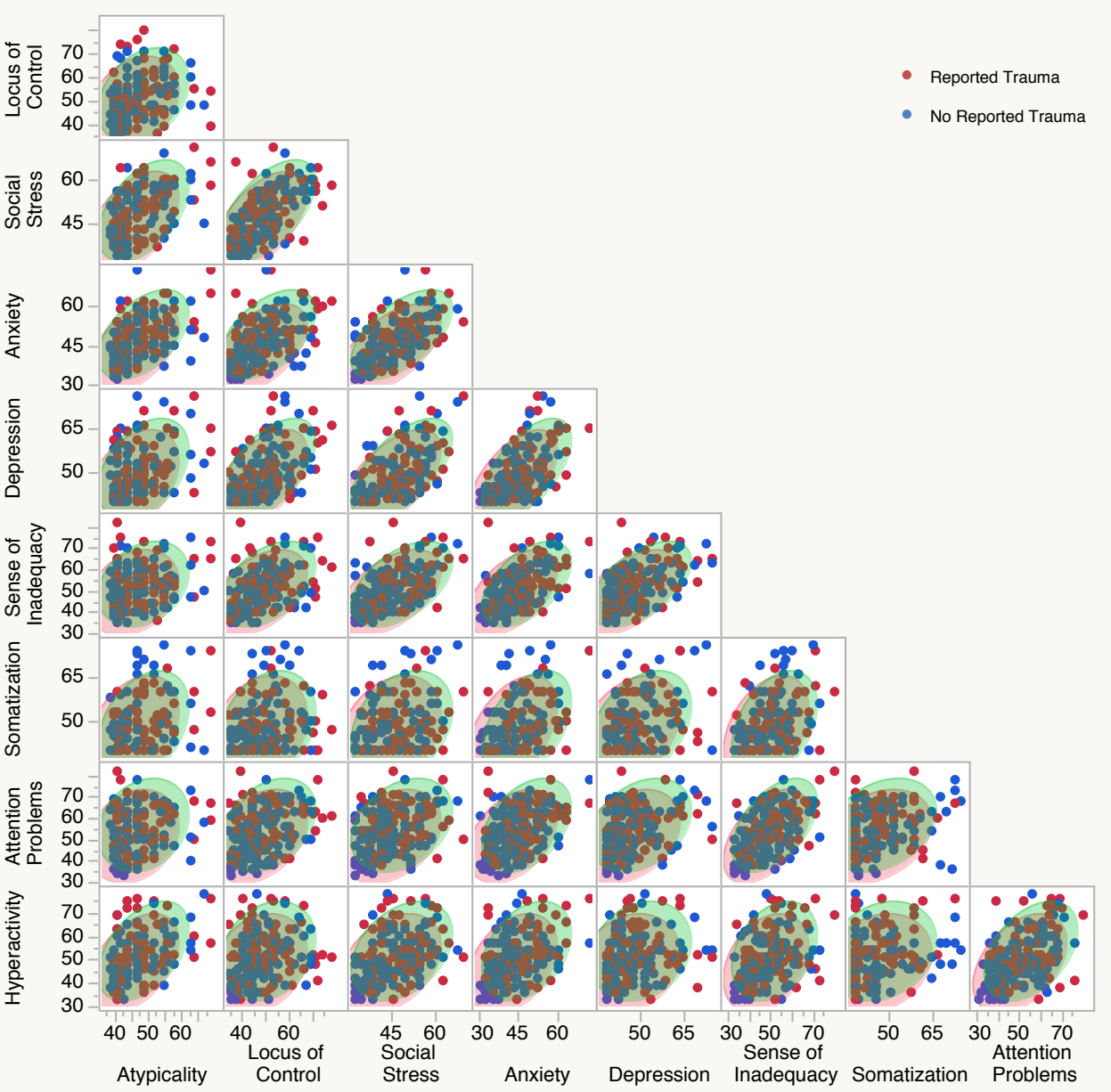


Figure 6.2.2. *Scatterplot of BASC-2 Clinical Scale Function for Male Offenders*

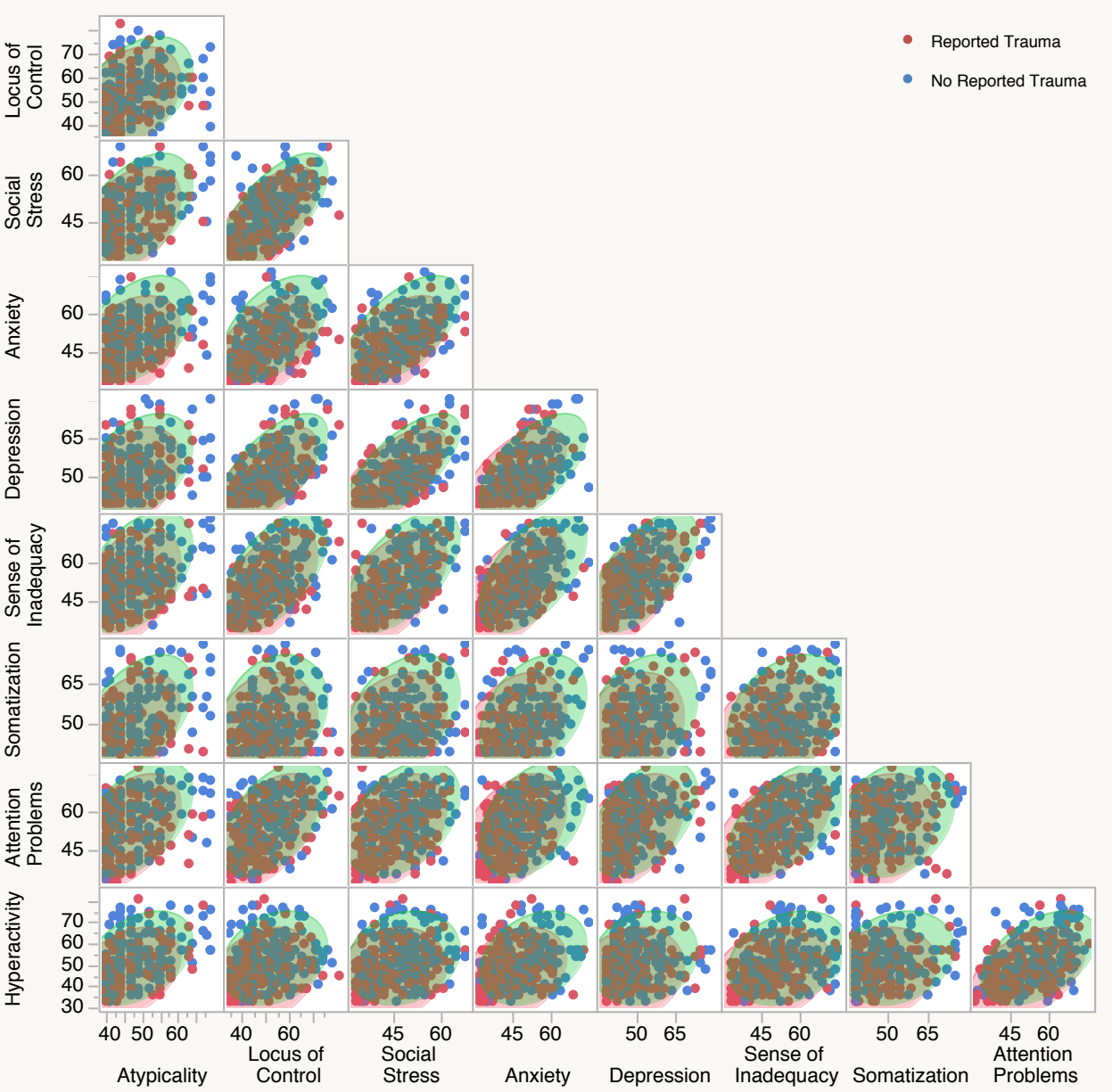


Figure 6.2.3. *Scatterplot of BASC-2 Clinical Scale Function for Female Offenders*

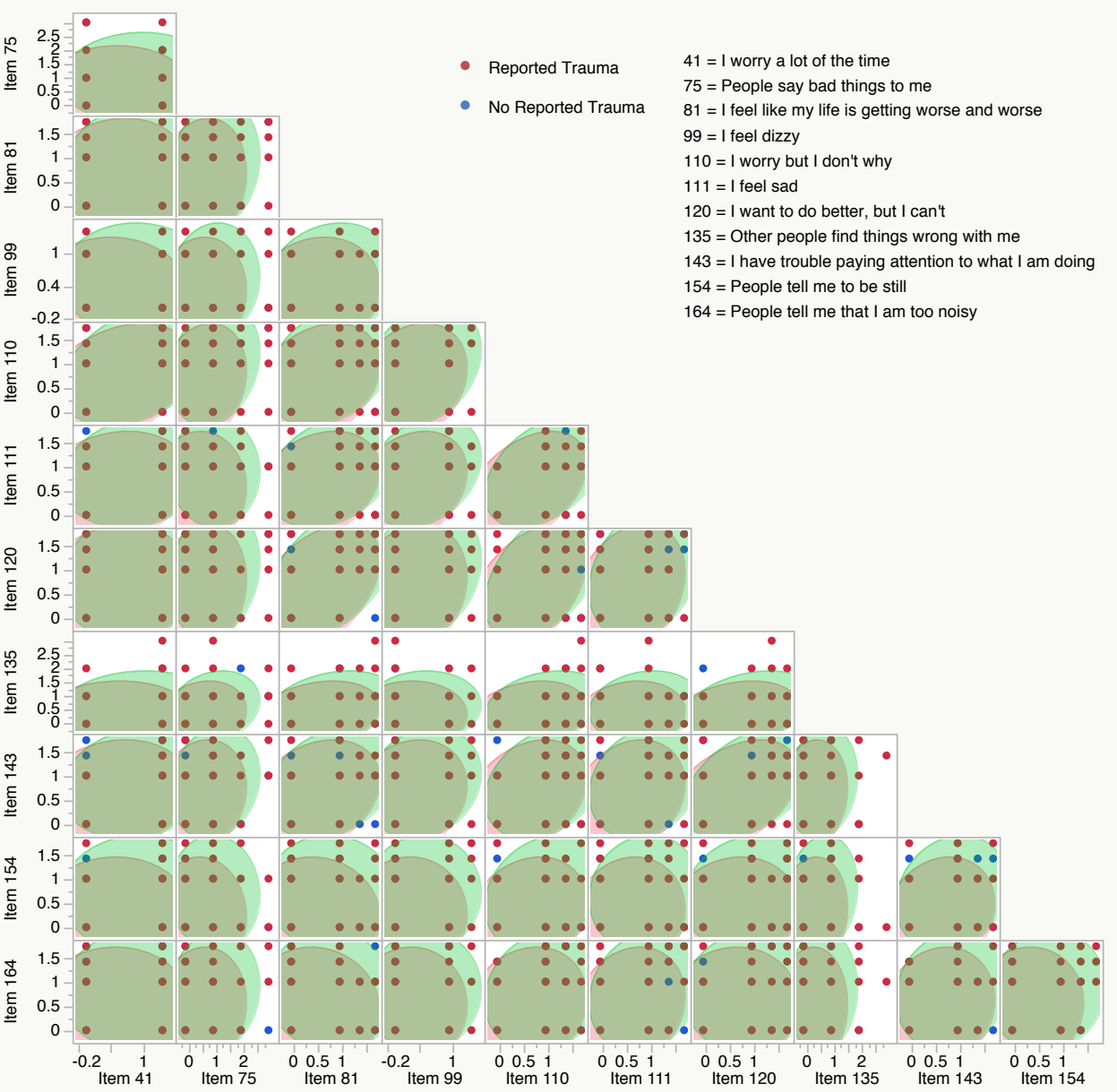


Figure 6.2.4. *Scatterplot of Trauma Composite Function for Delinquent Girls*

STUDY THREE

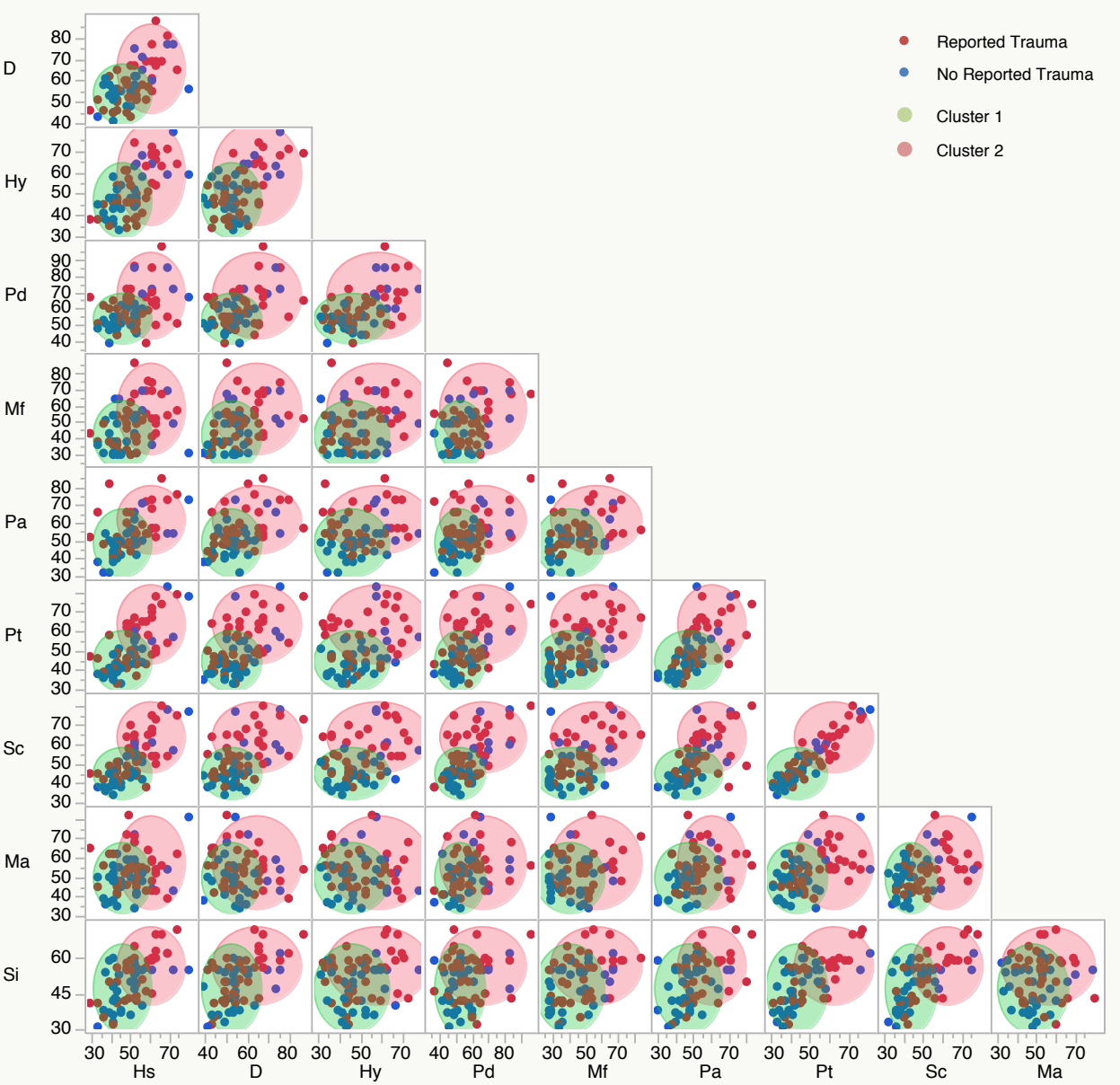


Figure 6.3.1. *Scatterplot of Two-Cluster Solution with MMPI-A Clinical Scales*

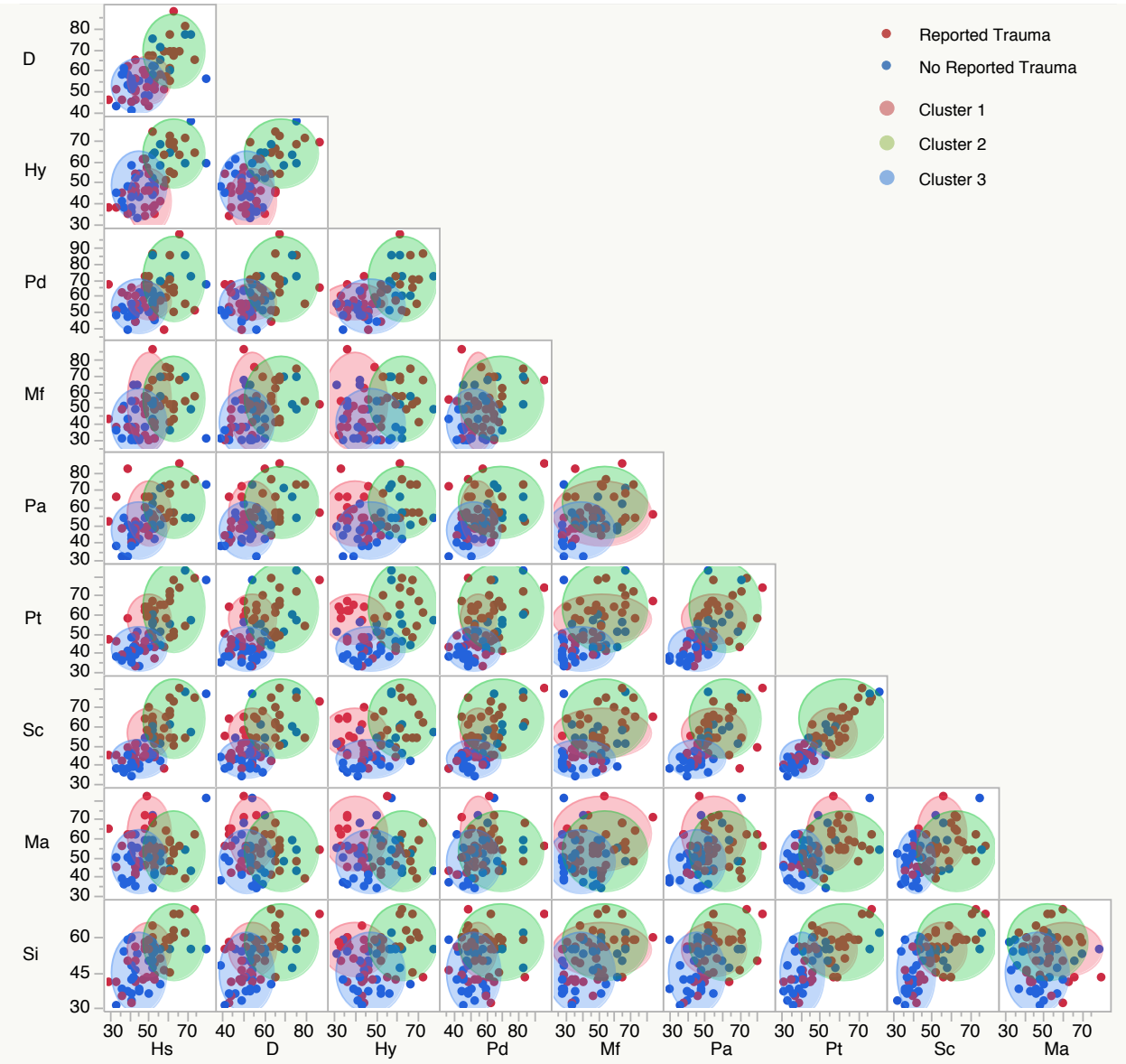


Figure 6.3.2. *Scatterplot of Three-Cluster Solution with MMPI-A Clinical Scales*

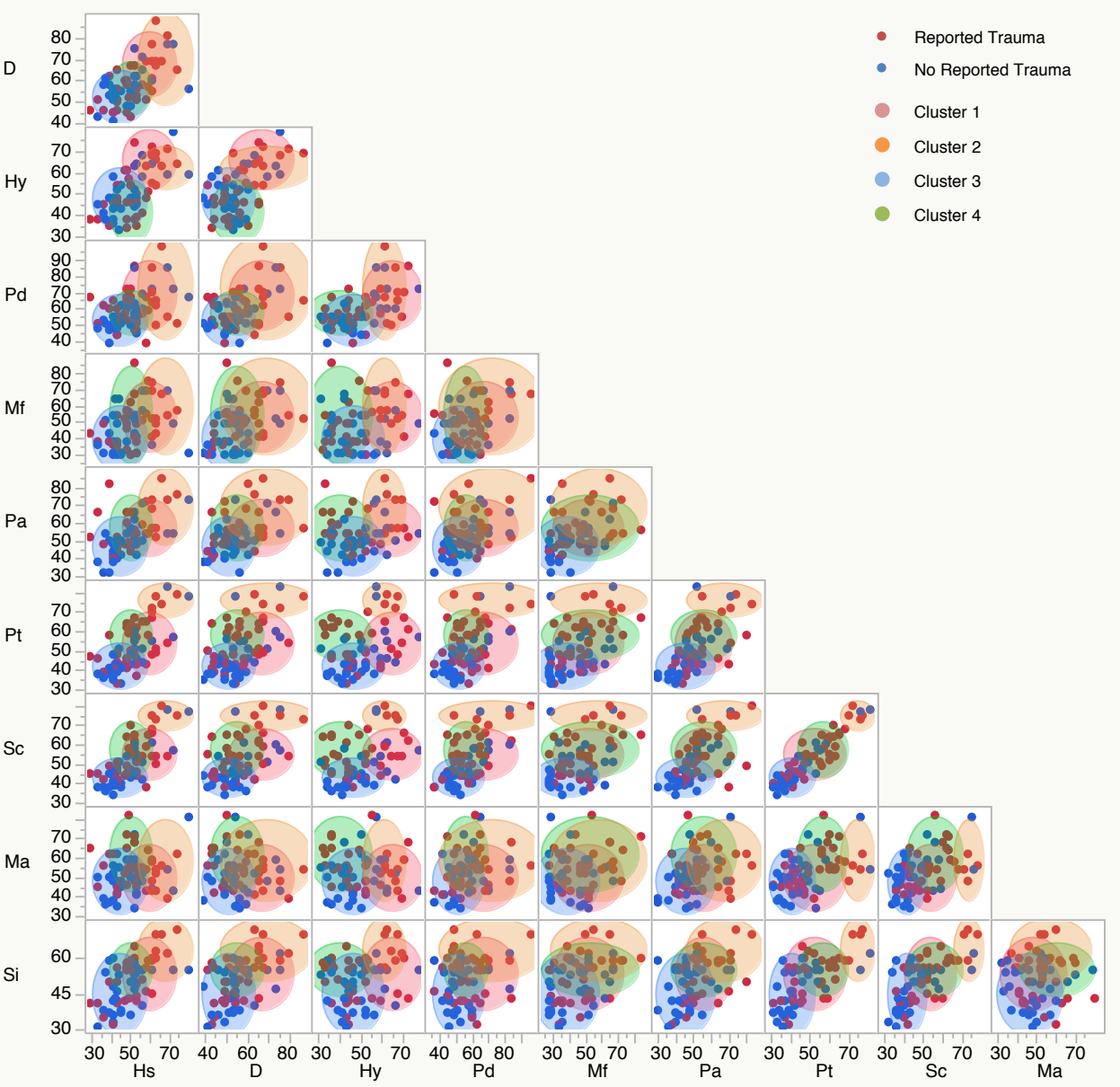


Figure 6.3.3. *Scatterplot of Four-Cluster with MMPI-A Clinical Scales*

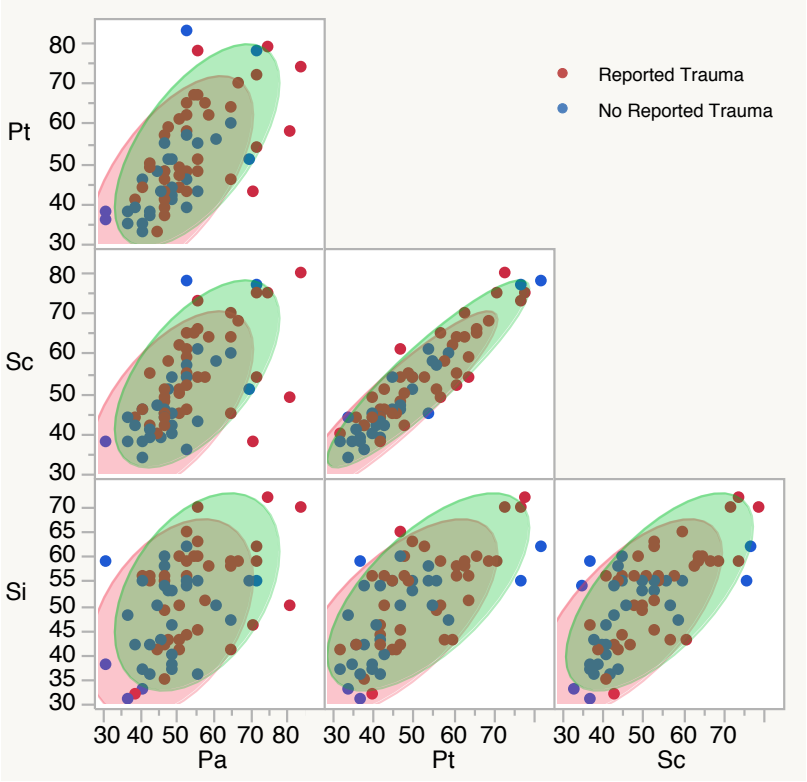


Figure 6.3.4. *Scatterplot of Selected MMPI-A Clinical Scale Function*

APPENDIX E

SAMPLE TRAUMA SCREENING MEASURES*

*Trauma measures in this sample have not been validated outside of their respective instruments and should not be used in practice without permission from test authors. Sample measures are provided here for visual reference only – measures in this section might be used for further research only after receiving written permission from test authors. Violation or use of the following sample trauma measures may result in punitive action by test authors or other agents that hold the original copyright thereto.

CROPS 14-ITEM FACTOR*

Name: _____Date: _____Age: _____

Offense(s)_____Gender: _____

Mark how true each statement feels for you **in the past week.**
Don't skip any, even if you're not sure. There is no right or wrong answer.
Answer by circling **0** for ***none*****, 1** for ***some,*** and **2** for ***lots.***

None	Some	Lots	
0	1	2	I find it hard to concentrate.
0	1	2	I worry that bad things will happen.
0	1	2	It is hard for me to go to sleep at night.
0	1	2	I have bad dreams or nightmares.
0	1	2	I feel all alone.
0	1	2	I feel strange or different than other kids.
0	1	2	I feel like there's something wrong with me.
0	1	2	I feel like it's my fault when bad things happen.
0	1	2	I'm a jinx, or bad-luck charm.
0	1	2	I feel sad or depressed.
0	1	2	I don't feel like doing much.
0	1	2	My future looks bad.
0	1	2	I'm on the lookout for bad things that might happen.
0	1	2	I am nervous or jumpy.

*Items excerpted from the *Child Report of Posttraumatic Symptoms* (CROPS; Greenwald & Rubin, 1999). Use and/or reproduction of this scale without the written permission of CROPS authors or other agents that hold the copyright thereto is prohibited.

BASC-2 Trauma Composite for Delinquent Girls*

Name_____ Date_____

Offense(s)_____ Age_____

This form contains sentences that young people may use to describe how they think or feel or act. Read each sentence carefully. You have 4 answer choices: **N** (0), **S** (1), **O** (2), and **A** (3). For question 1, circle ***True*** (1) if the answer is true for you or ***False*** (0) if the answer is not true for you.

Select **N** if the sentence ***never*** describes you or how you feel
Select **S** if the sentence ***sometimes*** describes you or how you feel
Select **O** if the sentence ***often*** describes you or how you feel
Select **A** if the sentence ***almost always*** describes you or how you feel

1. I worry a lot of the time	**True**			**False**
2. People say bad things to me	**N**	**S**	**O**	**A**
3. I feel like my life is getting worse and worse	**N**	**S**	**O**	**A**
4. I feel dizzy	**N**	**S**	**O**	**A**
5. I worry but I don't why	**N**	**S**	**O**	**A**
6. I feel sad	**N**	**S**	**O**	**A**
7. I want to do better, but I can't	**N**	**S**	**O**	**A**
8. Other people find things wrong with me	**N**	**S**	**O**	**A**
9. I have trouble paying attention to what I am doing	**N**	**S**	**O**	**A**
10. People tell me to be still	**N**	**S**	**O**	**A**
11. People tell me that I am too noisy	**N**	**S**	**O**	**A**

*Items excerpted from the both the second and third edition of the *Behavior Assessment System for Children* (BASC; Reynolds & Kamphaus, 2004; Reynolds & Kamphaus, 2015). Use and/or reproduction of this scale without the written permission of BASC-3 authors or other agents that hold the copyright thereto is prohibited.

MMPI-A TRAUMA SCALE FOR JUVENILE OFFENDERS (TSJO)*

Name_____Date_____Age_____

Offense(s)_____Gender_____

This form contains sentences that young people may use to describe how they think or feel or act. Circle ***True*** (1) if the answer is true for you or ***False*** (0) if the answer is not true for you.

1. I have a good appetite**	**True**	**False**
2. I am bothered by an upset stomach several times a week	**True**	**False**
3. I shrink from facing a crisis or difficulty	**True**	**False**
4. At times I feel like smashing things	**True**	**False**
5. Once a week or oftener I suddenly feel hot all over, for no real reason	**True**	**False**
6. I am a very sociable person**	**True**	**False**
7. My memory seems to be alright**	**True**	**False**
8. I frequently notice my hand shakes when I try to do something	**True**	**False**
9. I sometimes think about killing myself	**True**	**False**
10. Even when I am with people I feel lonely much of the time	**True**	**False**
11. I am easily embarrassed	**True**	**False**
12. I feel anxiety about something or someone almost all the time	**True**	**False**
13. I have strange and peculiar thoughts	**True**	**False**
14. The things that some of my family have done have frightened me	**True**	**False**
15. I feel unable to tell anyone all about myself	**True**	**False**
16. I am often sorry because I am so irritable and grouchy	**True**	**False**
17. I have missed a lot of school in my life because of sickness	**True**	**False**

*Items excerpted from the *Minnesota Multiphasic Personality Inventory—Adolescent* (MMPI-A; Butcher et al., 1992). Use and/or reproduction of this scale without the written permission of MMPI-A authors or other agents that hold the copyright thereto is prohibited.

**Items demarcated with asterisks are reversed scored – i.e. *False* = 1 and *True* = 0.