IDENTIFYING TRAUMA SYMPTOMATOLOGY AMONG ADJUDICATED YOUTH USING THE BASC-2 SRP AND CROPS

by

AMANDA MARIE PERKINS

(Under the Direction of Georgia Calhoun)

ABSTRACT

The objective of this study was to determine the ability of the Behavior Assessment System for Children, Self Report of Personality-Adolescent, 2nd edition (BASC-2-SRP-A; Reynolds & Kamphaus, 2004) to predict trauma symtomatology based on the Child Report of Posttraumatic Stress (CROPS; Greenwald & Rubin, 1999) among a sample of 59 male and 59 female adjudicated youth. Results indicated that 52.5% ($N = 62$) of juvenile offenders' CROPS scores fell within the clinically significant range, with females scoring significantly higher than males. Results also support the construct validity of the 26 item CROPS. In addition, logistic regression revealed that clinically significant CROPS scores were predicted by BASC-2-SRP Social Stress and Somatization scale scores. A second logistic regression indicated that among youth with significant CROPS scores, gender was predicted by Sensation Seeking and Depression scale scores. The results of the analysis support the validity of the CROPS and suggest that, with further analysis, the BASC-2-SRP may have the potential to identify profiles of juvenile offenders with a history of trauma.

INDEX WORDS: Juvenile offenders, Adjudicated youth, Delinquency, Recidivism, Trauma

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AMANDA MARIE PERKINS

B.A., Augusta State University, 2003

M.S., Augusta State University, 2011

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

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2015

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AMANDA MARIE PERKINS

Major Professor: Georgia Calhoun

Committee: Brian Glaser
V. Gayle Spears
Alan Stewart

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
August 2015

DEDICATION

For Den Den and Tammy, whose lively spirits convinced me to take a risk and pursue a dream. To Jim, for your never-ending support of my personal and professional growth. At the end of this tunnel, your honorary PhD in Counseling Psychology and a tub of cheesy popcorn await you.

ACKNOWLEDGMENTS

I would like to express my gratitude to the Counseling Psychology faculty members at the University of Georgia who have supported this project. To Dr. Georgia Calhoun, for her love of students and for bringing me into this program as her advisee. Your efforts to go above and beyond for your students are noticed and appreciated. To Dr. Brian Glaser, for his endless wit and positivity. To Dr. Gayle Spears, for her dependability, availability, and humor. To Dr. Alan Stewart for his statistical support and encouragement. Together, you form the ultimate committee, in which each of you has made this journey enjoyable. Thank you for your investment in me. I am indebted to the students involved in the Juvenile Counseling and Assessment Program, without whom this work would not be possible and the youth involved in this study would go unserved. This project is for the child within each of us.

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CHAPTER ONE

Introduction

Context within Counseling Psychology

According to numerous researchers, a significant number of youth enter the juvenile justice system as a result of suffering from mental health problems (Kerig, Bennett, Thompson, & Becker, 2012; Kerig & Becker, 2010; Kerig & Wenar, 2006). The prevalence of at least one mental health disorder among adjudicated youth has been estimated in the range of 40-82% compared to 9 to 33% in the general population (Lyons, Baerger, Quigley, Erlich, & Griffin, 2001; Wood, Foy, Layne, Pynoos, & James, 2002). Further, increasing numbers of studies indicate that trauma exposure and posttraumatic stress symptoms play a significant role in the path to juvenile delinquency (Kerig, Bennett, Thompson, & Becker, 2012; Kerig & Becker, 2010; Kerig & Wenar, 2006; Kerig, Ward, Vanderzee, & Moeddel, 2009; Ford, 2002; Begle, Hanson, Danielson, McCart, Ruggiero, Saunders, et al. 2011). Adjudicated youth exposed to trauma and who experience mental health issues have a higher likelihood for recidivism; therefore, accurate diagnosis is critical for youth in the juvenile justice system (Becker, Kerig, Lim, & Ezechukwu, 2012; Dembo, Turner, Chin, Scheidler, Bordon, & Manning, 1995). Appropriate diagnosis and treatment of trauma is necessary to reduce the chances of further delinquent behavior related to posttraumatic symptoms, as well as improve a juvenile's chances for successful rehabilitation (Wolpaw & Ford, 2004).

The study of trauma and delinquency is relevant to the field of Counseling Psychology for several reasons. First, Counseling Psychology is a diverse field unified by the central roles of remediation, prevention, and education (Gelso & Fretz, 2001). The remediation and prevention of mental health issues, such as posttraumatic stress and delinquency-related behavior, is directly related to the historical roles of the profession. Second, Counseling Psychology is suited to explore adolescent mental health issues because of the field's appreciation of the developmental and lifespan perspectives. Finally, Counseling Psychology's science-practitioner model and emphasis on psychometrics indicate a unique goodness of fit with the topic of trauma assessment and juvenile delinquency (Whitely, 1984; Kazdin, 2005).

In summary, the field of Counseling Psychology encompasses values and goals, such as prevention and remediation across the lifespan via evidence-based methods, which make it well suited to investigate the identification of trauma among adjudicated youth.

Statement of the problem

The relationship between childhood trauma and involvement in juvenile justice system is supported by both concurrent and longitudinal research (Becker & Kerig, 2011; Cernkovich, Lanctot, & Giordano, 2008; Wood et al., 2002; Begle et al., 2011). Youth in detention are more likely to be victims of maltreatment, sexual abuse, and physical abuse than are youth in the general population, with youth in the juvenile justice system reporting victimization rates as high as 70-92% (Robertson, Baird-Thomas, & Stein, 2008; McMackin, Morissey, Newman, Erwin, & Daly, 1998). Detained youth also present with greater rates of posttraumatic stress disorder compared to their community

peers (Saltzman, Pynoos, Layne, Steinberg, & Aisenberg, 2001; Becker & Kerig, 2011; Cook, Spinazzola, Ford, Lanktree, Blaustein, Cloitre, DeRosa, Hubbard, Kagan, Liautaud, Mallah, Olafson, van der Kolk, & Bessel, 2005).

In a longitudinal study of 1,575 youth, youth with a history of victimization were more likely to be arrested in adulthood (Widom and Maxfield, 2001). Notably, the findings were generalizable across ethnicity and gender. Results of Becker and Kerig's analysis (2011) indicated that severity of PTSD symptoms was related to number of arrests and delinquency severity among a sample of male juvenile detainees. Furthermore, these results were present after controlling for the total number of traumatic events reported (Becker & Kerig, 2011). These results underscore the necessity of the accurate diagnosis and treatment of posttraumatic symptoms in delinquent youth.

Identifying traumatized youth is critical, yet challenging. First, youth may display a broader range of posttraumatic symptoms than adults and as specified by DSM criteria (American Psychiatric Association, 2000; Saigh, Yasik, Sack, & Koplewicz, 1999; Kerig & Bennett, 2013). For example, while the DSM emphasizes reexperiencing, avoidance, and hyperarousal in response to a discrete event, some youth are exposed to prolonged abuse and neglect by their caregivers (Robertson, Baird-Thomas, & Stein, 2008). As a result, youth may exhibit additional symptoms consistent with complex trauma, which can include alterations in consciousness, self-perception, affect regulation, perception of the perpetrator, relations with others, and systems of meaning (Herman, 1992; Kerig, Moeddel, & Becker; 2011; Ford, Chapman, Pearson, Borum, & Wolpaw, 2008; Soloman & Heide, 1999). Second, youth may be resistant to report exposure to potentially stigmatizing events. Dembo, Schmeidler, and Childs (2007) compared official records

with the self-reports of adjudicated youth (59% Caucasian, 39% African American, and 26% Hispanic) and found that both male and female youth were more likely to report physical abuse than sexual abuse. Compared to males, females were more likely to report physical abuse; however, both males and females were greatly unwilling to report sexual abuse. Kerig, Moeddel, & Becker (2011) also found that youth had difficulty reporting these types of experiences due to definitional problems ("rape"). Another barrier to identifying traumatized youth is that emotional numbing as a coping strategy may impact youth's awareness and identification of events as traumatic (Kerig & Bennett, 2013). Finally, evidence suggests that the subjective reactions of individuals, not the objective facts, are more predictive of PTSD (Kerig & Bennett, 2013; Bowlby, 1998). Thus, screening and assessment measures based solely on DSM criteria and exposure to specific events may not most accurately capture the trauma experiences and reactions of youth.

For example, The Massachusetts Youth Screening Instrument-2 "traumatic experiences" (MAYSI-2 TE; Grisso & Barnum, 2006) subscale is popularly used to screen for PTSD among adjudicated youth. However, the measure's language-- requiring youth to endorse whether or not they have experienced "rape" or "something very bad' or "terrifying"—may result in underreporting. Additionally, several studies (Kerig, Moeddel, & Becker; 2011; Ford, Chapman, Pearson, Borum, & Wolpaw, 2008) have suggested that the measure does not capture the experiences of adjudicated youth reporting symptoms consistent with complex trauma resulting from chronic abuse and neglect. Similarly, the UCLA PTSD Reaction Index (PTSD-RI; Pynoos, Rodriguez, Steinberg, Brymer, Decker, & Pynoos, 2004) is based on DSM-IV criteria (American

Psychiatric Association, 2000) and requires youth to endorse exposure to specific events. The Trauma Symptom Checklist for Children (TSCC; Briere, 1996), while useful, neglects to assess for the somatization and negative view of the future often reported by traumatized youth (Kerig, Moeddel, & Becker; 2011).

Purpose of the Study

Despite increased awareness of the role of trauma in delinquency, few measures in existence have been normed with this population, setting, and purpose in mind. This study extends previous research by exploring the Behavior Assessment System for Children, Second Edition- Self Report (BASC-2-SRP; Reynolds & Kamphaus, 2004) and Child Report of Posttraumatic Symptoms (CROPS; Greenwald & Rubin, 1999) profiles of adjudicated youth. In an earlier study, Perkins, Calhoun, and Glaser (2013; in press) found that BASC-2-SRP profiles of adjudicated youth differed based on clinically significant scores on the CROPS, a self-report measure of posttraumatic symptoms. These results suggest that the BASC-2-SRP may be useful in identifying youth experiencing trauma reactions.

While the BASC-2 manual provides some data for discrimination of clinical groups, none is given for PTSD (Reynolds & Kamphaus, 2004). Further, although the CROPS shows promise as a broad screening measure of posttraumatic symptoms in youth, further validation with juvenile offenders is needed (Greenwald, 2002; Soberman, Greenwald, & Rule, 2002). Validity and reliability are characteristics of an instruments use, within a specific setting with a particular population, not properties of the instrument itself (Kazdin, 2005). Thus, support for the validity of an instrument's use within each setting and population of interest is necessary. Further understanding of the relationship

between the BASC-2-SRP and CROPS scores within a sample of adjudicated youth will provide information relevant to psychologists and other service providers involved in the assessment and treatment of juvenile offenders.

Research Statement

The current study seeks to determine if the BASC-2-SRP clinical scales can be used to identify adjudicated youth experiencing trauma reactions as measured by the CROPS. A logistic regression will be used to explore whether the BASC-2-SRP profiles of youth can be used to successfully predict youth with and without clinically significant CROPS.

Research Questions

The following research questions are based on Perkins, Calhoun, and Glaser's (2013; in press) recent study and a review of relevant literature on trauma symtomatology:

1) Is there a significant relationship on any of the clinical BASC-2-SRP scores between adjudicated youth who report trauma symptomatolgy (as measured by a score greater than or equal to 19 on the CROPS) and those who do not report trauma symptoms?

   Null Hypothesis 1: There will be no significant relationship on any of the clinical BASC-2-SRP scores between adjudicated youth who report trauma symptomatolgy (as measured by a score greater than or equal to 19 on the CROPS) and those who do not report trauma symptoms.

2) Do any of the clinical BASC-2-SRP scores predict trauma symptomatology among adjudicated youth?

Null Hypothesis 2: None of the clinical BASC-2-SRP scores will predict trauma symptomatology among adjudicated youth.

3) Do any of the clinical BASC-2-SRP scores predict gender of adjudicated youth who report trauma symptoms?

   Null Hypothesis 3: None of the clinical BASC-2-SRP scores will predict trauma symptomatology among adjudicated youth.

Definition of Terms

Childhood Trauma.

Broadly, Terr (1991) defined childhood trauma as the mental consequences of one or more external "blows" (unexpected or anticipated) "rendering the young person temporarily helpless and breaking past ordinary coping and defense operations" (pg. 11).

Posttraumatic Stress Disorder (PTSD).

According to the Diagnostic and Statistical Manual of Mental Health Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013), a diagnosis of PTSD is characterized by the following criteria:

A. *Stressor:* The individual was exposed to actual or threatened: 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:* The individual re-experiences the event(s) in one or more of the following ways:

1. Recurrent, involuntary, and intrusive memories, which in children older than six may be present in repetitive play.
2. Recurrent distressing dreams, which may or may not exhibit content related to the traumatic event.
3. Flashbacks or other dissociative experiences that may range from short episodes to complete loss of consciousness to reenactment of traumatic events during play.
4. Psychological distress following exposure to reminders of the event(s).
5. Physiological reactivity following exposure to reminders of the 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:

1. Memory loss related to important details of the event(s) not due to physical injury or substances
2. Persistent and distorted negative worldview and expectations

3. Persistent and distorted sense of responsibility (self or others) regarding the event(s)
4. Persistent negative emotions
5. Significantly decreased interest in activities as compared to prior to the event(s)
6. Feelings of detachment or estrangement
7. Persistent inability to experience positive emotions

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

1. Aggressive or irritable behavior
2. Reckless or self-destructive behavior
3. Hypervigilance
4. Exaggerated startle response
5. Difficulty concentrating
6. 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.

Adjudicated Youth.

In this study, adjudicated youth are individuals ages 12-17 who are involved in the juvenile court system either via the probation office or juvenile detention.

CHAPTER TWO

Review of Relevant Literature

Posttraumatic Stress Disorder (PTSD)

Posttraumatic stress disorder (PTSD) was introduced in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III)* by the American Psychiatric Association in 1980 (American Psychiatric Association, 1980). Originally developed in reference to the experiences of war veterans, precipitating events of PTSD more recently include those in which the individual "experienced, witnessed or was confronted with an event(s) that involved actual or threatened death or serious injury or a threat to the physical integrity of self and others," and which evoked "intense fear, helplessness, or horror" (American Psychiatric Association, 2000). While the American Psychiatric Association (2013) released slightly updated criteria for PTSD in the Diagnostic and Statistical Manual of Mental Health Disorders (5th ed.; DSM-5), the bulk of current research is based on the DSM-IV-TR criteria. Based on the DSM-IV-TR (American Psychiatric Association, 2000), the PTSD diagnosis is based on the assertion that traumatic events result in a presentation of symptoms from three groups:

1. Re-experiencing the traumatic event in at least one of the following ways:
    a. Recurrent and intrusive disturbing recollections of the event
    b. Recurrent, upsetting dreams about the event
    c. Feelings of reliving the event

d. Psychological distress when exposed to internal or external reminders of the event

e. Physiological distress when exposed to internal or external reminders of the event

2. Persistent avoidance of stimuli associated with the traumatic event and a general numbing of responsiveness through at least three of the following:

a. Avoidance of thoughts, feelings, and conversation pertaining to the event

b. Avoidance of people, places, or activities that remind the person of the trauma

c. Inability to remember important parts of the event

d. Diminished participation or interest in previously enjoyed activities

e. Feelings of detachment and estrangement from others

f. Restricted range of affect

g. Sense of a foreshortened future

A. Persistent symptoms of hyperarousal involving at least two of the following:

1. Difficulty falling or staying asleep

2. Irritability or anger outbursts

3. Difficulty concentrating

4. Hypervigilance

5. Exaggerated startle response

To meet criteria for the diagnosis of PTSD based on the DSM-IV-TR criteria, these symptoms must not have been present prior to the traumatic experience and must cause clinically significant distress or impairment.

Research supports the conception of traumatic stress reactions as continuous rather than as discrete and categorical (i.e., all or nothing) (Marshall, Olfson, Hellman, Blanco, Guardino, & Struening, 2001; Rothbuam, Foa, Riggs, Murdock, & Walsh, 1992). In a more recent study investigating the latent structure of PTSD among adolescents, Broman-Fulks and colleagues (2009) also found support for PTSD as a dimensional construct. Therefore, assessment instruments that assess reactions on a continuum are likely more accurate and useful than categorical assessments (Broman-Fulks, Ruggiero, Green, Smith, Hanson, Kilpatrick, and Saunders, 2009).

Most individuals who meet PTSD criteria also meet criteria for at least one other disorder (Brady, Killeen, Brewerton, & Lucerini, 2000). The most common comorbid diagnoses are depressive, anxiety, and substance abuse disorders (Breslau, Davis, Peterson, & Schultz, 2000).

Trauma Exposure and PTSD in the General Population

In the U.S., approximately 80% of individuals in the community have experienced one or more traumatic event (Breslau, 2009). Kessler et al. (2005) reported that 60.7% of American males and 51.2% of females ages 15-24 reported experiencing one or more traumatic events. According to the National Comorbidity Survey Replication (NCS-R), the lifetime prevalence of PTSD among adults in the general population is estimated

around 6.8% (2005). In regards to gender, the lifetime prevalence has been estimated around 9.7% for females and 3.6% for males (National Comorbidity Survey, 2005) While males are more likely to experience trauma, studies consistently show that the prevalence of PTSD is higher among women than men (Breslau, 2009).

Trauma Exposure and PTSD in Youth

The lifetime occurrence of trauma exposure among urban youth under the age of 23 has been estimated around 82.5%, with males more likely to experience trauma than females (Breslau et al., 2004). According to Finkelhor, Ormrod, and Turner (2007), among a U.S. representative sample of youth ages 2-17 years, 71% had one or more traumatic experiences in the last year. Nearly 70% of the youth in this sample reported multiple exposures, with a mean of 3 different types of victimization. Prevalence estimates for youth indicate a trend similar to that seen in adults, with approximately 3.7% of male and 6.3% of female youth ages 12 to 17 meeting criteria for PTSD (Kilpatrick, Ruggiero, Acierno, Saunders, Resnick, & Best, 2003).

Differential impact of categories of traumatic events

In general, severity of the event is related to higher levels of PTSD symptoms (Pynoos et al., 1987). Thus, *subjective experience* and interpretation of trauma experiences rather than the type of event is more greatly associated with difficulties (Taylor & Weems, 2010). Recent evidence also highlights the role of a predisposition to maladaptive reactions in the development of PTSD (Breslau, Peterson, & Schultz, 2008).

Type I and Type II Trauma

A widely used method of conceptualizing trauma was introduced by Terr (1991). Broadly, trauma is defined as the psychological outcome of a single or series of external

events that render the victim temporarily helpless and disrupt ordinary coping mechanisms. This definition includes not only events that are unanticipated, but also events that occur over a period of time and that the victim can anticipate. According to Terr (1991), Type I traumatic events consist of a single event, while Type II trauma results from repeated exposure over time to traumatic events. Terr proposed that most survivors of childhood trauma display the following characteristics: repeated memories of the event; traumatic reenactment of the experience; fear of event-related stimuli; and pessimistic worldview and a limited sense of the future (Terr, 1991; Soloman & Heide, 1999). Soloman and Heide (1999) later suggested that Type II traumas be divided into two categories: Type II and Type III traumas, with the latter including multiple events "beginning at an early age and continuing for years", such as recurring abuse. The current DSM-V (American Psychiatric Association, 2013) definition of PTSD is based on Type I traumas.

Type II and III traumas, such as chronic childhood maltreatment or abuse, have come to be categorized as "complex PTSD" (Cook et al., 2005; Ford, 2005; Herman, 1992) but are not accounted for by single diagnosis in the DSM-V (American Psychiatric Association, 2013). Children who have experienced Type II trauma tend to experience relational problems, anger, shame, low self-esteem, and alterations in memory and consciousness (Soloman and Heide, 1999). Further, individuals who have experienced trauma are more likely to have a comorbid conduct, attention deficit, depression, or dissociative disorder (Terr, 1991).

Poly-victimization

Poly-victimization, or experiencing *multiple types* of trauma, places youth at risk for increased mental health issues, delinquency, and further victimization (Finkelhor, Ormrod, & Turner, 2007). The ongoing impact of poly-victimization may be a result of one or a combination of several factors, such as biological or cognitive dysfunction, peer influences, and substance use (Ford et al., 2010). Ford and associates (2010) found that compared to non-poly-victimized youth, adolescents who experienced multiple types of trauma reported engaging in more delinquent acts. These youth had twice the risk for depression, triple the risk for PTSD, 3-5 times increased risk of substance use disorders, and eight times increased risk of comorbid mental health disorders. These effects remained after controlling for age, gender, ethnicity, and psychiatric morbidity. An important implication was that the relationship between poly-victimization and delinquency was independent of a diagnosis of PTSD. These results suggest that a broader symptomology is associated with poly-victimization and may lead to delinquent behavior.

Recent research by Briere and associates indicates a linear relationship between the total number of *different types* of childhood traumatic events (as opposed to the frequency of or specific type of event) experienced and symptom complexity (Briere, Kaltman, & Green, 2008). According to Cloitre et al., (2009), the number of types of interpersonal trauma experienced more strongly predict PTSD symptomology than do the frequency and duration of victimization.

Interpersonal and Non-Interpersonal Trauma

In addition to categorization by number of events, traumas are also commonly

viewed as interpersonal versus non-interpersonal experiences (Herman, 1992). Non-interpersonal traumas are experiences such as motor vehicle accidents and natural disasters. Interpersonal traumas are those in which an individual perpetrates on another, such as sexual and physical abuse, emotional abuse, physical neglect, and witnessing domestic violence. Research suggests that interpersonal traumas are more likely to result in PTSD than other types of traumas (Luthra et al., 2009). Brier, Hodges, and Godbout (2010) found a relationship between cumulative exposure to different types of interpersonal trauma and dysfunctional avoidance; posttraumatic stress and reduced affect regulation abilities mediated the relationship. Of note, a significant association between dysfunctional avoidance and accumulated noninterpersonal trauma was not found. These results highlight that interpersonal traumas tend to be associated with more negative outcomes.

Complex PTSD/Developmental Trauma Disorder

Herman's (1992, 2012) theory of Complex Posttraumatic Stress Disorder (CPTSD) describes a range of reactions, including alterations in consciousness, self-perception, affect regulation, perception of the perpetrator, relations with others, and systems of meaning that are the result of "complex trauma"--prolonged, repeated traumas that begin early in life (Resick, Bovin, Calloway, Dick, King, Mitchell, Suvak, Wells, Stirman, & Wolf, 2012). Courtois (2004) suggested that CPTSD might also result from a single traumatic event. The complex trauma reactions described by Herman (1992) and by more recent studies (Cook et al., 2005) capture symptoms of mental health disorders that are often comorbid with PTSD, such as anxiety, depression, substance abuse, oppositional-defiant disorder, and conduct disorder. These symptoms may also be

present in individuals who have experienced trauma but do not meet DSM criteria for PTSD.

An important characteristic of complex trauma is the interruption of the individual's development in childhood, which negatively impacts self-regulation and self-definition (Courtois & Ford, 2009). Behaviors such as dissociation and substance abuse may represent avoidance as an attempt to manage overwhelming emotional states (van der Kolk, Pelcovitz, Roth, & Mandel, 1996; Briere, Hodges, & Godbout, 2010). *Repeated interpersonal trauma* in particular may result in avoidance due to producing long-term negative emotional states and dysregulation (Briere et al., 2010). Youth exposed to complex trauma are at increased risk for additional trauma exposure, mental health disorders, as well as physical, legal, vocational, and interpersonal impairment (Cook et al., 2005; Cloitre, Petkova, Wang, & Lu, 2012; Briere, Kaltman, & Green, 2008).

Complex PTSD was proposed for inclusion in the DSM-V under the name "Developmental Trauma Disorder," however, to date, no research provides sufficient evidence that CPTSD should be considered as a diagnostic category separate from PTSD (Resick et al., 2012).

Child Maltreatment, Abuse, and Neglect

The Federal Child Abuse Prevention and Treatment Act (CAPTA) defines child abuse and neglect as "any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation, or an act or failure to act which presents an imminent risk of serious harm" (Child Welfare Information Gateway, 2013). There are several widely accepted types of child maltreatment. *Physical abuse* is characterized by non-accidental physical acts that caused

or could have caused the victim physical injury. *Sexual abuse* is the use or coercion of a child to engage in any sexually explicit conduct. *Emotional or psychological abuse* involves behaviors that impair a child's emotional well-being. *Neglect* refers to the failure to meet a child's basic needs and includes education, access to medical care, housing, food, clothing, and inadequate supervision (Child Welfare Information Gateway, 2013).

Incidence of child maltreatment, abuse, and neglect

According to the U.S. Department of Health and Human Services (2012), in 2011, there were reportedly 676,569 victims of child maltreatment in the U.S. Of these youth, 78.5% experienced neglect, 17.6% physical abuse, and 9.1% sexual abuse; 48.6 percent of victims were male and 51.1 percent were female. The racial/ethnic identities of most victims were African American (21.5%), Hispanic (22.1%), and White (43.9%). In the general population, child abuse rates are estimated at 5-8% in males and 12-17% in females (Gorey & Leslie, 1997).

Impact of child maltreatment, abuse, neglect

According to Putnam (2006), two developmental processes are adversely affected by child maltreatment: neurodevelopment and psychosocial development.
Child abuse impairs brain maturation, which has long-term consequences for cognitive, language, and academic abilities and is associated with mental health disorders (McCrory, De Brito, & Viding, 2010). Failure to develop social and emotional competence during childhood may lead to maladaptive coping throughout life. Over time, the cumulative impact may increase the risk of mental and physical health problems (Luecken, Roubinov, & Tanaka, 2013), including alcoholism, depression, drug abuse,

eating disorders, obesity, high-risk sexual behaviors, smoking, suicide, and certain chronic diseases (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, et al., 1998; Felitti & Anda, 2009; Runyan, Wattam, Ikeda, Hassan, & Ramiro, 2002). Briere and colleagues (2003) identified physical and sexual abuse as risk factors for borderline, paranoid and antisocial personality disorders.

Depression is 3 to 5 times more common in individuals who have experienced child maltreatment (Putnam, 2006) and these individuals are 12 times more likely to attempt suicide (Dube, Anda, Felitti, Chapman, Williamson, & Giles, 2001). They are 6-12 times more likely to have drug and alcohol problems and 18-21 times more likely to become substance abusers (Dube, Anda, Whitfield, Brown, Felitti, Dong, & Giles, 2005). Approximately half of maltreated children experience significant academic and behavioral issues. They are more likely to be arrested for criminal involvement both in adolescence and adulthood (Holowka, King, Saheb, Pukall, & Brunet, 2003). Recently, Silvern and Griese (2012) found that approximately 81.9% of adjudicated youth experienced at least one type of maltreatment.

Psychological versus Physical Maltreatment

Butany and associates recently attempted to separate the impact of physical and psychological maltreatment on adolescents (Butaney, Pelcovitz, & Kaplan, 2011). The results of their study indicated that above the influence of physical abuse, age, IQ, and gender, *psychological maltreatment* uniquely contributed to the prediction of maladjustment. In fact, only psychological maltreatment was able to predict maladjustment from both the adolescent and parent reports. Further, the study concluded that level of exposure to psychological maltreatment was the only predictor for both

internalizing and externalizing symptoms.

Child Sexual Abuse

Studies comparing the effects of various types of trauma exposure have suggested that experiencing sexual abuse and assault may carry greater risks of PTSD than other types of traumatic events (Kessler, Sonnega, Berglund, Delmer, Jin, Merkangas, & Walters, 2005). The National Survey of Adolescents revealed that sexually assaulted males and females reported engaging in more delinquent acts than those who had not been assaulted (Kilpatrick, Saunders, & Smith, 2003).

Child Neglect

Neglected youth are at increased risk to have cognitive, emotional, academic, social, and developmental delays (Weinstein & Weinstein, 2000). In comparison to non-neglected youth, these youth have a greater risk of developing conduct disorders and of participating in delinquent behavior (Williams, Ayers, & Arthur, 1997). Compared to youth who experience other categories of maltreatment, those who are neglected exhibit more internalizing than externalizing disorders (Hildyard & Wolfe, 2002).

Traumatic grief and loss

Both the unexpected and expected separation from, loss, or death of a loved one is considered to be a traumatic event (Terr, 1991). Research has linked these types of traumatic loss to delinquency (Maschi, 2006). In fact, among youth who have experienced multiple types of trauma, loss of a loved one was identified as the most significant event (Breslau et al., 2004).

Gender Differences

As previously stated, despite males's greater exposure to trauma, females display a higher prevalence of PTSD (Breslau, 2009). However, as discussed by Breslau (2009), no clear explanation exists. While Kerig et al. (2011) found that females report higher rates of interpersonal traumas than do their male counterparts, this has not been found responsible for higher incidence of PTSD (Tolin & Foa, 2006). Additionally, when prior trauma exposure is controlled for, these differences remain (Tolin & Foa, 2006). According to Breslau (2009), preexisting mood disorders are also unlikely causes of the greater occurrence of PTSD among females. Finally, a recent exploration of measurement invariance suggests that the gender difference in vulnerability to PTSD is unlikely attributable to gender-related bias in reporting (Chung & Breslau, 2008).

Ethnicity/Race

There is less clarity in the research regarding PTSD, race, and ethnicity. In regards to exposure, The National Incidence Study of Child Abuse and Neglect (Sedlak, Mettenburg, Winglee, Ciarico, & Basena, 2010) found that African American children had higher rates of substantiated and unsubstantiated abuse and maltreatment than White and Latino children, but further exploration indicated that these results were significantly related to differences in socioeconomic status. Mannarino, Cohen, and Gregor (1989) and Pole, Gone, and Kulkarni (2008) found no significant differences in rates of PTSD among youth based on race and ethnicity. Similarly, Abram, Tepling, Charles, Longworth, McClellan, and Dulcan's (2004) study found that African American and Hispanic youth are not more likely than White youth to report trauma exposure or PTSD. In contrast, one study suggested that White children experience less severe reactions to

trauma than African American and Latino youth (Sanders-Phillips, Moisan, Wadlington, Morgan, & English, 1995).

Risk Factors

Across populations, three risk factors for PTSD have been identified: personal mental health history, family mental health history, and exposure to adverse events during childhood (Brewin, Andrews, & Valentine, 2000). A history of depressive and anxiety disorders, as well as traits of neuroticism have also been linked to PTSD (Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski; 1998). Trauma reactions are also related to variables such as poor social support, lower socioeconomic status, and stigma related to the experience (Briere & Spinazzola, 2005). While numerous cross-sectional and retrospective studies suggest that prior exposure to trauma is associated with an increased probability of PTSD (Breslae, 2009; Breslau, Chilcoat, Kessler, & Davis, 1999), a predisposition to maladaptive reactions to stress may better explain the development of PTSD in reaction to both the previous trauma as well as subsequent traumas (Breslau, Peterson, & Schultz, 2008). In a longitudinal epidemiologic study, Breslau, Peterson, and Schultz (2008) found support for this assertion. Of note, females were found to have a higher risk of PTSD, even when controlling for prior PTSD exposure, no PTSD, and preexisting major depressive disorder.

In regards to children, three factors that have been shown to increase the likelihood of the development of PTSD: severity of the traumatic event, parental reaction to the traumatic event, and physical proximity to the traumatic event (Pynoos et al., 1987). In general, severity of the event is related to higher levels of PTSD symptoms. Youth with greater family support and less parental distress report lower levels of PTSD

symptoms. Finally, youth who are farther away from the traumatic event report less distress (Pynoos et al., 1987).

Impact of trauma on the mental health of youth

Research supports that youth who are exposed to trauma during childhood often suffer from a range of psychological, behavioral, and emotional problems, social maladjustment, and academic failure (Afifi, Asmundson, Taylor, & Jang, 2010; Shutay, Williams & Shutay, 2011; Putnam, 2006). Development delays during childhood may lead to maladaptive responses across the lifespan, and over time, may increase the risk of problems, such as PTSD, mood disorders, substance use, lower economic status, and poorer physical health (Luecken, Roubinov, & Tanaka, 2013). Posttraumatic stress has been found to mediate the relationship between trauma in childhood and later pathological behavior (Ruchkin, Henrich, Jones, Vermeiren, & Schwab-Stone, 2007). In regards to physical health, adverse childhood experiences are strongly associated with heart disease, cancer, diabetes, liver disease, and emphysema, which are all leading causes of death (Felitti et al., 1998).

Pynoos, Steinberg, and Picentini (1999) assert that trauma symptoms interfere with children's social and academic functioning, as well as delay their developmental trajectories. Children who experience trauma may not meet the criteria for a formal diagnosis of PTSD, but may suffer from sleep dysregulation, paranoia, irritability, anger, and difficulties at school (Gospodarevskaya & Segal, 2012). According to Terr (1985), children may be more likely to display trauma via their play and art work, rather than through avoidance or numbing as is seen in adults. Adolescents may display more externalizing and dissociative symptoms (Terr, 1991) or symptoms such as withdrawal,

emotional numbing, low self-esteem, increased sensitivity to perceived threats, and/or increased risk-taking behavior (Putnam, 2006). Compared to their nontraumatized peers, youth who experience physical or sexual abuse are up to three times more likely to abuse substances (Kilpatrick, Saunders, & Smith, 2003). Youth who experience trauma and lack affect regulation skills may utilize maladaptive coping behaviors (i.e., use of substances or aggressive behavior), which are directly associated with involvement in the justice system (Kerig et al., 2012)

Mental Health Disorders Among Adjudicated Youth

Youth entering the justice system typically exhibit complex mental health needs, with the prevalence of at least one mental health disorder among adjudicated youth estimated in the range of 40-82% compared to 9 to 33% in the general population (Wood et al., 2002; Lyons, et al., 2001). Teplin, Abram, McClelland, Dulcan, and Mericle (2002) found that 27% of males and 84% of females met criteria for at least one DSM-IV diagnosis. These estimates of mental health disorders among incarcerated youth are approximately 2 to 3 times greater than the general population (Grisso & Underwood, 2004; Cocozza, 1992; Kazdin, 2000). Even after excluding conduct disorder, approximately two thirds of youths involved the juvenile justice system meet criteria for a mental health diagnosis (Grande, Hallman, Underwood, Warren, & Rehfuss, 2012; Abram, Teplin, McClelland, & Dulcan, 2003). In regards to gender differences, female offenders report higher levels of internalizing symptoms such as depression, anxiety, PTSD, and suicidal ideation (McCabe, Lansing, Garland, & Hough, 2002; Teplin et al., 2002; Grande, Hallman, Underwood, Warren, & Rehfuss, 2012).

Trauma exposure and PTSD among adjudicated youth

Compared to their nonadjudicated peers, adjudicated youth present with greater rates of trauma exposure and PTSD (Becker & Kerig, 2011). Youth in the juvenile justice system are more likely to be victimized than are youth in the general population, with rates estimated at 70-92% (McMackin et al. 1998). Abram et al.'s (2004) study found that 84% of girls and 93% of boys in a juvenile justice setting had experienced a traumatic event; a mean of 14 distinct traumas was reported.

The prevalence of PTSD among juvenile offenders is approximately 8 times higher than in community samples (Robertson et al, 2008; Wolpaw & Ford, 2004), with rates ranging from 30-52% (Abram et al., 2004). No differences in prevalence have been found based on race/ethnicity. Among juvenile detainees with PTSD, 93% meet criteria for at least one comorbid disorder. In contrast, only 64% of detainees without PTSD meet criteria for a comorbid disorder (Abram, Washburn, Teplin, Emanuel, Romero, & McClelland, 2007). Among youth with PTSD, 54% meet criteria for 2 or more comorbid disorders and 11% meet criteria for 4 disorders (Brady, Killeen, Brewerton, & Lucerini, 2000). The prevalence of drug abuse, which is the most common comorbid disorder among youth with PTSD, is 2-3 times higher among detainees than in samples from the community (Giaconia, Reinherz, & Silverman, 1995).

With respect to gender differences, female adolescent offenders report exposure to a higher number of traumatic events (Brosky & Lally, 2004). In addition, interpersonal traumas are more common for females in this population (Kerig et al., 2011), with adjudicated females reporting an average of four sexual assaults before the age of 12 (McCabe et al., 2002). Adjudicated females also exhibit higher rates of PTSD symptoms

than their male counterparts. Kerig, Vanderzee, Becker, and Ward (2012) found that females endorsed experiencing more interpersonal trauma, greater PTSD symptoms, and more mental health problems as compared to males. For all youth, avoidance mediated the relationship between trauma and internalizing symptoms, while reexperiencing and arousal mediated externalizing symptoms. For males specifically, noninterpersonal traumas were associated with PTSD symptoms, which mediated internalizing symptoms. For females only, reexperiencing and arousal mediated internalizing symptoms, and related PTSD symptoms mediated externalizing symptoms (Kerig, Vanderzee, et al., 2012). This study highlights the differential effects of trauma based on gender. Perhaps not surprisingly, female delinquency behavior is typically related to coping with traumatic experiences (Kerig & Becker, 2012). Kerig and Becker (2012) provide a detailed account of the current knowledge regarding girls and delinquency.

Trauma and delinquency

The relationship between childhood trauma and involvement in the juvenile justice system is supported by both concurrent and longitudinal research (Becker & Kerig, 2011; Cernkovich, Lanctot, & Giordano, 2008; Wood et al., 2002; Begle et al. 2011). Traumatic victimization (which includes neglect, as well as physical and sexual abuse) is directly associated with behaviors involved in delinquency (Ford, Chapman, Mack, & Pearson, 2006). Poly-victimization, or exposure to multiple traumatic events, is associated with an even greater risk to child development (Ford, Elhai, Connor, & Frueh, 2010).

Longitudinal studies indicate that experiencing interpersonal trauma predicts delinquent behavior just one year later (Begle et al., 2011). Furthermore, adjudicated

youth exposed to interpersonal violence and who experience mental health issues are at increased risk for recidivism (Dembo et al., 1995). Children who have experienced abuse are up to nine times more likely to become involved in criminal activities (Gold, Wolan Sullivan, & Lewis, 2011; Widom & Maxfield, 2001). African American males with a history of childhood maltreatment are more likely than their counterparts with no history to become involved in the juvenile justice system (Williams, Van Dorn, Bright, Jonson-Reid, & Nebbitt, 2010). Youth with a history of victimization are also more likely to be arrested as adults (Widom & Maxfield, 2001). Notably, these results are generalizable across race and gender. Shaffer and Ruback (2002) also found that violent victimization is associated with violent offending. Results of Becker and Kerig's analysis (2011) indicated that severity of trauma symptoms was positively related to arrest frequency and delinquency severity among a sample of male adjudicated youth. Furthermore, this effect remained present even after controlling for the total number of traumatic events reported (Becker & Kerig, 2011).

Over a period of three years, Becker and associates (2012) investigated the relationships among PTSD, mental health difficulties, age, ethnicity, gender, and recidivism in a sample of adjudicated youth. Results indicated that compared to their peers, females and younger African American youth with PTSD had a greater tendency to reoffend (Becker, Kerig, Lim, & Ezechukwu, 2012). Males reported greater alcohol/drug use, while girls reported more anger/irritability upon entrance into the justice system. Younger youth with PTSD tended to report increased anger/irritability and depression/anxiety, while older youth with greater substance use, anger/irritability, somatic complaints, and depression/anxiety.

Mechanisms that Account for the Relationship Between Trauma and Delinquency

The "cycle of violence" theory posits that victimization in childhood or adolescence increases the likelihood of delinquency in adulthood (Widom, 1992; Widom & Maxfield, 2001). Recent evidence supports this theory, indicating that trauma is a developmental risk factor for delinquent behavior, interfering with emotional, cognitive, and behavioral regulation (Allwood, Bell, & Horan, 2011; Kerig & Bennett, 2013; Maschi, 2006). Despite evidence regarding the relationship between trauma and delinquency, clear conclusions regarding specific causal relationships are limited due to a lack of longitudinal studies (Kerig & Becker, 2010). Furthermore, as discussed by Danielson, Begle, Ayer, & Hanson (2012), the relationship between trauma and delinquency seems to be bidirectional. A detailed account of various models describing the relationship between trauma and delinquency is provided by Kerig and Becker (2010).

Emotional Processes

Emotional dysregulation, a core feature of both PTSD and delinquency (Ford, 2002) has been suggested as a link between trauma and delinquent behavior in several ways. First, delinquency behavior has been hypothesized to be the result of increases in impulsivity, irritability, and oppositionality secondary to trauma (Pappagallo, Silva, & Rojas, 2004). Silvern, and Griese (2012) found that exposure to multiple traumas predicted reactive aggression and dissociative symptoms among adjudicated youth; the relationship between multiple victimization and reactive aggression was fully mediated by dissociative symptoms and partially mediated by PTSD symptoms. Maschi, Bradley,

and Morgen (2008) found that anger and delinquent peer exposure mediated the relationship between trauma and delinquency.

Additionally, emotional numbing has been investigated by numerous researchers and found to play a role in helping youth cope with overwhelming distress (Lansford, Malone, Stevens, Dodge, Bates, & Pettit, 2006; Allwood & Bell, 2008). As a result, youth may be more likely to engage in externalizing behaviors. For example, emotional numbing and diminished fear in the context of high posttraumatic arousal have shown to be related to violence exposure and delinquent behavior (Allwood, Bell, & Horan, 2011; Kerig, Bennett, Thompson, & Becker, 2012).

Similar to emotional numbing, emotional, cognitive, and behavioral avoidance have also been highlighted as possible affective regulation strategies that may link trauma to delinquency (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Briere (2002) described how traumatized youth lacking adaptive coping strategies turn to tension-reduction behaviors such as substance use.

Cognitive Processes

Traumatized adjudicated youth exhibit impaired executive functioning in areas such as decision-making and judgment (Kerig & Wenar, 2006) and these impairments likely influence youth's problematic behavior. Additionally, Feiring and colleagues (2007) posit that perceptions of stigma and shame regarding traumatic events contribute to the development of a deviant identity. In an effort to act consistently with that identity, youth are then drawn towards delinquent peers and behaviors. Shame is believed to be converted into anger, which increases externalizing behavior. For example, in a study of sexually abused males and females, the relationship between stigma, shame, and

delinquent behavior was mediated by anger and affiliation with deviant peers (Feiring et al., 2007). Traumatized youth may also be cognitively primed to respond aggressively (Dodge, Petit, Bates, & Volente, 1995).

Trauma Coping Model

Ford and colleagues (2006) propose an integrated model in an attempt to explain how trauma might influence delinquent behavior via biological, cognitive, and emotional processes. Specifically, they contend that in an effort to assert control over feelings of hopelessness and shame, traumatized youth move into a "survival coping mode" in which they adopt masks of callousness and outward defiance. Over time, heightened arousal deplete youth's executive functioning. Furthermore, in the event that the social and interpersonal environment does not meet the individual's needs, the individual may continue to lose empathy towards others, and adopt a "by any means necessary" mentality regarding self-protection.

Trauma as a result of delinquency

While some behaviors (i.e., truancy, substance use) may be direct coping mechanisms secondary to trauma, it is also likely that engagement in delinquent behaviors increases exposure to traumatic events (Danielson, Begle, Ayer, & Hanson, 2012). Research supports that adolescents who engage in delinquent behaviors are more likely to be victimized (Wood et al., 2002). In the Begle and associates study cited above (2011), youth engaged in delinquency were more likely to report physical abuse a year later. These results were consistent across gender. However, for sexual abuse, females who engaged in delinquent behavior *were not* more likely to report *sexual abuse* after a year in comparison to females who did not report engaging in delinquent behaviors.

The Role of Trauma in Female Delinquency

According to Kerig and Becker (2012), trauma may be differentially related to female delinquency for several reasons. In addition to females being at a greater risk than males to develop posttraumatic stress disorder (Chung & Breslau, 2008; Tolin & Foa, 2006), delinquent females may also be exposed to more traumatic events (especially interpersonal traumas) than males (Kerig & Becker, 2012; Kerig et al., 2011). Furthermore, female delinquency behavior is typically related to coping with traumatic experiences (Kerig & Becker, 2012).

Psychological Evaluations with Juvenile Offenders

Upon entering the juvenile justice system, youth are typically screened for behavioral and mental health needs (Hoge, 2012; National Center for Mental Health and Juvenile Justice, & United States of America; 2009). According to Grisso (2005), the juvenile justice system is required to respond to the mental health needs of adjudicated youth due to custodial obligation. Additionally, youth have due process rights, meaning that the system is obligated to identify any conditions that might impair decision-making and competency. Third, the juvenile justice system is obligated to take reasonable steps to protect the public from harm, which includes providing mental health services to decrease immediate and future risk of harm.

Without thorough assessment, youth may be denied necessary treatment or provided inappropriate treatment based on behavioral diagnoses without attending to the underlying experiences that are contributing to the symptoms (Grisso & Underwood, 2004). Trauma-informed evaluation by a psychologist utilizes multi-modal assessment procedures, such as a review of the youth's records, clinical interview with youth (and

guardians, if available), and various empirically based psychological assessment measures (Newman, 2002).

Evaluating Trauma Among Juvenile Offenders

Identifying traumatized youth is critical, yet challenging. First, youth may display a broader range of posttraumatic symptoms than adults and as specified by DSM criteria (American Psychiatric Association, 2000; Saigh, Yasik, Sack, & Koplewicz, 1999; Kerig & Bennett, 2013). For example, while the DSM emphasizes reexperiencing, avoidance, and hyperarousal in response to a discrete event, some youth are exposed to prolonged abuse and neglect by their caregivers (Robertson, Baird-Thomas, & Stein, 2008). As a result, youth may exhibit additional symptoms consistent with complex trauma, which can include disruptions in consciousness, self-perception, affect regulation, interpersonal relations, and systems of meaning (Herman, 1992; Kerig, Moeddel, & Becker; 2011; Ford, Chapman, Pearson, Borum, & Wolpaw, 2008; Soloman & Heide, 1999).

Another barrier to identifying traumatized youth is that emotional numbing as a coping strategy may impact youth's awareness and identification of events as traumatic (Kerig & Bennett, 2013). Additionally, youth may be resistant to report exposure to potentially stigmatizing events. Dembo, Schmeidler, and Childs (2007) compared official records with the self-reports of adjudicated youth (59% Caucasian, 39% African American, and 26% Hispanic) and found that both male and female youth were more likely to report physical abuse than sexual abuse. Compared to males, females were more likely to report physical abuse; however, both males and females were greatly unwilling to report sexual abuse. Kerig, Moeddel, & Becker (2011) also found that youth had difficulty reporting these types of experiences due to definitional problems ("rape").

Finally, evidence suggests that the subjective reactions of individuals, not the objective facts, are more predictive of PTSD (Kerig & Bennett, 2013; Bowlby, 1998). Thus, screening and assessment measures based solely on DSM criteria and exposure to specific events may not most accurately capture the trauma experiences and reactions of youth.

For example, The Massachusetts Youth Screening Instrument-2 "traumatic experiences" (MAYSI-2 TE; Grisso & Barnum, 2006) subscale is popularly used to screen for PTSD among adjudicated youth (National Center for Mental Health and Juvenile Justice, & United States of America; 2009). However, the measure's language--requiring youth to endorse whether or not they have experienced "rape" or "something very bad' or "terrifying"—may result in underreporting. Additionally, several studies have suggested that the measure does not capture the experiences of adjudicated youth reporting symptoms consistent with complex trauma resulting from chronic abuse and neglect (Kerig, Moeddel, & Becker; 2011; Ford, Chapman, Pearson, Borum, & Wolpaw, 2008). Similarly, the PTSD-RI (Pynoos et al., 1987) is based on DSM-IV criteria (American Psychiatric Association, 2000) and requires youth to endorse exposure to specific events. The Trauma Symptom Checklist for Children (TSCC; Briere, 1996), while useful, neglects to assess for the somatization and negative view of the future often reported by traumatized youth (Kerig, Moeddel, & Becker; 2011).

BASC-2- SRP

The Behavior Assessment System for Children, Second Edition- Self Report (BASC-2-SRP; Reynolds & Kamphaus, 2004) consists of Clinical scales and Adaptive scales that compare a child's adjustment with same age peers. Consisting of 139 items,

the measure generates T-scores and percentile ranks for the following scales: Attitude to School, Attitude to Teachers, Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Attention Problems, Hyperactivity, Relations with Parents, Interpersonal Relations, Self-Esteem, and Self-Reliance. The BASC's norms are based on a U.S. sample of youth representative of the general population regarding gender, race/ethnicity, parent education, geographic region, and clinical or special education classification (Reynolds & Kamphaus, (2004).

The Clinical scales assess maladjustment and high scores on these scales represent behaviors that impair functioning in home, school, peer relationships, 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 Adaptive scales (Interpersonal Relations, Relations with Parents, Self-Esteem, and Self-Reliance) focus on positive or desirable 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 those that are equal to or below 30. In addition to the Clinical and Adaptive scale scores, the BASC-2-SRP also provides five composite scores including: School Problems, Internalizing Problems, Inattention/Hyperactivity, Emotional Symptoms, and Personal Adjustment. A child's social and emotional status is compared to peers by analyzing T-scores and percentile ranks.

The BASC- 2-SRP has demonstrated sound psychometric properties, including internal consistency as well as discriminant and convergent validity (Reynolds & Kamphaus, 2004). Internal consistency estimates for scales range from .61 to .90. In

regards to the composite scales, alphas range from .83 to .95, falling in the moderate to excellent range. Test-retest reliability correlations range from .61 to .84 for individual scales and from .74 to .84 for composites (Reynolds & Kamphaus, 2004).

Evaluating trauma with the BASC-2-SRP

Despite the demonstrated utility of the BASC-2, the affective, physical, and cognitive symptoms of several disorders may result in similar scale elevations, making specific attention to trauma history and possible posttraumatic symptoms necessary. For example, PTSD, ADHD, and GAD may present similarly, and thus require differentiation. Common symptoms include emotional lability, quick temper, hyperirritability, decreased self-esteem, restlessness, hyperactivity, sleep problems, attention problems, and memory and learning problems (American Psychiatric Association, 2000; Reynolds & Kamphaus, 2004). The BASC-2 manual indicates that youth who have experienced trauma are likely to have elevated Locus of Control scale scores, but again, no norms exist (Reynolds & Kamphaus, 2004).

Evidence indicates that several BASC-2 scales are related to trauma. Using the original version of the BASC, Evans and Oehler-Stinnett (2008) found that the BASC-SRP Anxiety and Atypicality subscales had the strongest relationship to measures of PTSD among a sample of community youth exposed to a tornado. In regards to trauma versus no-trauma groups, Relationship with Parents, Anxiety, Atypicality, Social Stress, and Locus of Control were found to differ significantly between groups. These results suggest that these scales may be related to CROPS scores and a diagnosis of PTSD. However, of note is the fact that the study found that no BASC-SRP scores were elevated

to a clinically significant level, demonstrating that further PTSD screening is needed, regardless of BASC-SRP scores.

In their recent study, Perkins, Calhoun, and Glaser (2013), established that adjudicated youth with clinically significant CROPS scores had a distinctly different BASC-2 profile than those without. Anxiety was found to contribute most to distinguishing between the clinically significant and non-significant CROPS groups, followed by the Social Stress and Somatization subscales. While females scored higher than males on two BASC-2 subscales (Anxiety and Somatization), no overall significant gender differences were found. These results highlight a cluster of BASC-2-SRP subscales that may be useful in identifying posttraumatic symptoms among adjudicated youth.

CROPS

The Child Report of Post-traumatic 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 7-17 in a various settings. Intended to screen for posttraumatic symptoms with or without an identified trauma, the measure assesses a broad range of symptoms found in Fletcher's (1993) meta-analysis of childhood trauma literature as well as symptoms described by the DSM-IV (American Psychiatric Association, 2000) PTSD criteria (Greenwald & Rubin, 1999). The response format for the measure is a 3-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 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. The first factor consists of items that describe an array of dysphoric symptoms, such as guilt, self-alienation, and a damaged sense of self. The second factor contains items pertaining to somatization, while items loading on the third factor pertain mostly to intrusive thoughts and avoidance. As the author notes, these findings suggest that the posttraumatic reactions of youth are different and perhaps broader than that seen in adults and measured by the DSM-IV criteria.

Several studies have demonstrated validity and reliability of the CROPS in various languages and across settings, with Cronbach's alpha reported around .9 (Greenwald & Rubin, 1999; Greenwald et al., 2002; Greenwald, 2008; Bocknek, Sanderson, & Britner, 2009). Excellent internal consistency was found for the CROPS with juveniles in a detention setting (Greenwald et al., 2002). Good concurrent validity between the CROPS and the Lifetime Incidence of Traumatic Events Scales was found (Greenwald & Rubin, 1999) and CROPS scores have also been found to correlate with the Trauma Symptom Checklist for Children (TSCC; Briere, 1996) (r= .70; Greenwald et al., 2001). The CROPS is also related to measures of distress, family stress, neuroticism, and with the degree of trauma experienced (Greenwald & Rubin, 1999; Greenwald et al., 2001). The CROPS has also shown to be responsive to changes in posttraumatic stress symptoms across settings (Greenwald et al., 2002; Greenwald, 2002; Jaberghadi, Greenwald, Rubin, Zand, & Dolatabadi, 2004), making it useful in assessing changes in functioning and response to treatment.

The CROPS provides several benefits not found in other popular measures such as the Trauma Symptom Checklist for Children (Briere, 1996). First, it provides a time

efficient means of screening for posttraumatic stress in youth, even when a specific traumatic event has not been identified (Greenwald & Rubin, 1999). Additionally, the inclusion of empirically supported, broader symptomolgy found in the child trauma literature (Fletcher, 1993) is a strength.

Despite these strengths of the CROPS, several limitations exist (Tsukernik & Zucker, 2005). One limitation is a lack of standardization and norms. Greenwald & Rubin (1999) report on the validity of the 28-item CROPS, while the latest 26-item version lacks research investigating its properties. While the measure has been utilized with a variety of populations, the majority of studies have involved community samples. Further, some popularly cited studies utilizing the CROPS have not yet been subjected to the peer review process (see Greenwald, et al., 2001 & 2002). Thus, additional research is needed examining the psychometrics of the measure in general, as well as with specific populations who report a high incidence of trauma.

For example, de Roos, Greenwald, de Jonghm and Noorthoorn (2004) investigated trauma symptoms with a sample of youth in the Netherlands, but were unable to establish validity and reliability. While Greenwald (2002) used the CROPS to assess mean changes in trauma symptoms among youth with conduct problems, no other statistics were reported. Similarly, several other studies used the CROPS to measure mean changes in trauma symptoms following EMDR and CBT treatments. In Jaberghadi et al.'s 2004 study with Iranian girls with a history of sexual trauma, pretest CROPS means (34.86 for EMDR group and 30 for CBT group) and posttest CROPS means (18.86 and 22.7) were reported.

More recently, de Roos and colleagues (2011) utilized the CROPS to assess changes in posttraumatic symptoms among disaster-exposed children. Pretreatment mean scores (22.7 for the CBT group and 23.3 for the EMDR group) and post-treatment mean scores (12.3 and 12.0, respectively) were reported. Of this sample, 32.7% reported no other trauma history; 25% reported at least one other traumatic event; 42.3% reported exposure to at least two traumatic events. On average, youth reported was 2.4 (*SD* = 1.31) prior traumatic exposures. Based on the reports of parents (via the UCLA parent form), 17.3% of these youth met full DSM-IV TR criteria for PTSD and 59.6% met partial criteria. Cronbach alpha was .89 in this study (de Roos et al., 2011).

Summary

As stated, concurrent and longitudinal research indicates that trauma exposure in youth is associated with mental health difficulties, as well as delinquency. Assessments in juvenile justice settings frequently do not rely on measures designed specifically for this population, which may contribute to the misdiagnosis of trauma reactions, and in turn, the delivery of inappropriate services and treatment. This study extends previous research (Perkins, Calhoun, & Glaser, 2013, in press; Greenwald, 2002; Reynolds & Kamphaus, 2004; Garner Evans and Oehler-Stinnett, 2008) by exploring the BASC-2-SRP and CROPS profiles of adjudicated youth. While the BASC-2 manual provides some data for discrimination of clinical groups, none is given for PTSD (Reynolds & Kamphaus, 2004). Further, although the CROPS shows promise as a broad screening measure of posttraumatic symptoms in youth, further validation with juvenile offenders, as well as exploration of potential gender differences, is needed (Greenwald, 2002; Soberman, Greenwald, & Rule, 2002). Given that validity and reliability are population and setting

specific, and not properties of the instrument itself (Kazdin, 2005), support for the validity of an instrument's use within each setting and population of interest is necessary. Further understanding of the relationship between BASC-2 and CROPS scores within a sample of adjudicated youth may provide information relevant to psychologists and other service providers involved in the treatment of juvenile offenders.

This study seeks to determine if the BASC-2-SRP clinical scales can be used to identify adjudicated youth experiencing trauma reactions as measured by the CROPS. A logistic regression will be used to explore whether the BASC-2-SRP scores of youth can be used to successfully predict youth with and without a clinically significant CROPS score.

CHAPTER THREE

Research Methodology

Participants

This study was based on a sample of adolescents from several Northeast Georgia counties who were referred by the juvenile court to participate in psychological evaluations for treatment and/or placement recommendations. Charges of youth include status offenses, drug charges, crimes against property, and crimes against persons. Doctoral graduate students conducted the psychological evaluations. Cases were chosen for this study from an archive of evaluations conducted 1998 through 2014. Cases included in this study were selected based on the following criteria: 1) the subject completed a BASC-2-SRP, and 2) the subject completed a CROPS.

A total of 121 psychological evaluations were examined for inclusion in this study. Prior to conducting the statistical analyses for the current study, the BASC-2-SRP validity scores were reviewed for each participant. Three cases were excluded based on invalid BASC-2-SRP profiles. Specifically, one case had an F scale score greater than 7; one case had an L scale score greater than 12; and one case had a V scale score greater than 4 (Reynolds & Kamphaus, 2004). As a result, 118 cases were identified as meeting criteria for inclusion in this study. The participants in this study (N = 118) were evenly split by gender; 50% were male (N = 59) and 50% were female (N = 59). The self-identified racial breakdown consisted mainly of African-American (N = 85; 72%) youths. There were also 16 White youths (13.6%), 15 Latino/a youths, (12.7%), 1 Asian-

American youth (.8%), and 1 youth who identified as Multiracial (.8%). The mean age of participants was 14.75 with a mean grade level of 8.85. Demographic data is listed in Table 1.

Table 1.
Demographic Characteristics of Participants
(N = 118)

Characteristics	N	%
Gender		
Male	59	50
Female	59	50
Race		
African American	85	72
Caucasian	16	13.6
Latino/a	15	12.7
Asian American	1	.8
Multiracial	1	.8

Procedure

The Behavioral Assessment System for Children-Self Report of Personality-Adolescent, Second Edition (BASC-2-SRP-A) (Reynolds & Kamphaus, 2004) and the Child Report of Posttraumatic Stress (CROPS) (Greenwald & Rubin, 1999) were administered as part of the standard intake process for counseling and psychological evaluations. Demographic information, as well as juvenile justice history, was gathered via clinical interview and court referral information.

Instruments

The Child Report of Post-traumatic Symptoms (CROPS)

The CROPS is a 26-item self-report questionnaire that screens for post-traumatic symptoms found in the DSM-IV (American Psychiatric Association, 1994) and child trauma literature (Greenwald & Rubin, 1999). Youth are asked to report symptoms experienced in the past week on a 0–2 scale of intensity (none, some, or lots), with total possible scores ranging from 0 to 52 and scores of 19 or higher indicating symptoms of clinical concern. The CROPS has demonstrated good validity and reliability across settings and populations, as well as sensitivity to changes in symptoms (Greenwald & Rubin, 1999; Wiedemann & Greenwald, 2000; Greenwald, Rubin, Jurkovic et al., 2002).

The Behavior Assessment System for Children, *Second Edition, Adolescent Version- Self Report* (BASC-2 SRP-A)

The BASC-2 SRP-A is used to measure the emotional and behavioral functioning of youth ages 12 to 18. The measure contains 176 items and generates T-scores and percentile ranks for 16 subscales, with five composite scales. Youth respond to statements in either a “true” or “false” format or in a four-point Likert rating: 0 (never), 1

(sometimes), 2 (often) and 3 (almost always). The normative sample for the BASC-2 SRP-A was comprised of 1,900 students aged 12–18 years and was stratified by gender, ethnicity, geographic location, and parent education level. Estimates of internal consistency for the subscales range from .61 to .90. In regards to the composite scales, alphas range from .83 to .95, falling in the moderate to excellent range. Test-retest reliability correlations range from .61 to .84 for individual scales (Reynolds & Kamphaus, 2004).

The Clinical scales (Attitude to School, Attitude to Teachers, Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Attention Problems, and Hyperactivity) assess maladjustment and high scores on these scales represent behaviors that impair functioning in home, school, peer relationships, 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 Adaptive scales (Interpersonal Relations, Relations with Parents, Self-Esteem, and Self-Reliance) focus on positive or desirable 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 those that are equal to or below 30. In addition to the Clinical and Adaptive scale scores, the BASC-2-SRP also provides five composite scores including: School Problems, Internalizing Problems, Inattention/Hyperactivity, Emotional Symptoms, and Personal Adjustment. A child's social and emotional status is compared to peers by analyzing T-scores and percentile ranks.

Analysis

No published studies utilizing the BASC-2-SRP clinical scales and CROPS were found; thus, this study is exploratory in nature. A descriptive analysis was first conducted to determine the demographic characteristics of the sample (see Table 1). The means and standard deviations for the BASC-2-SRP clinical scales and CROPS were also computed and appear in Table 2. Consistent with the recommendations of Peng and So (2002), in order to answer the first question (Is there a significant relationship between clinically significant CROPS scores and BASC-2-SRP clinical scale scores?), a Bivariate Correlation was performed. Next, to assess whether a combination of BASC-2-SRP clinical scale scores predicts a clinically significant CROPS score (yes/no), a logistic regression was performed. Logistic regression was chosen due to the categorical outcome of interest, which is often used in clinical settings during the screening process. Logistic regression was also used to assess if a combination of BASC-2-SRP clinical scale scores predicts the gender of adjudicated youth with clinically significant CROPS scores.

Limitations

Overall, the sample size was adequate for the analyses conducted. However, the sample of youth from the state of Georgia may not be representative of adjudicated youth from other demographic locations. Another potential limitation of this study is reliance on a self-report measure of trauma symptoms without confirming exposure to specific traumatic events. However, the CROPS was developed to measure trauma symptomatology with or without a specified traumatic event (Greenwald, 1999) and recent evidence suggests that the presence of trauma symptoms, not number of traumatic exposures, is associated with arrest frequency and delinquency severity among juvenile

offenders (Becker & Kerig, 2011).

Assumptions

It is assumed that all participants in this study are representative of typical adjudicated youth involved in the juvenile justice system. It is assumed that all the BASC-2-SRP validity indicators accurately screened-out youth who responded in an invalid manner. It is also assumed that youth self-report data is accurate. Finally, it is assumed that no data entry errors exist.

Research Questions

There are three research questions for the current study:

1. Do significant relationships exist between any of the BASC-2-SRP clinical scale scores and clinically significant CROPS scores of adjudicated youth?
2. Does a combination of BASC-2-SRP clinical scale scores predict clinically significant CROPS scores (yes/no) among adjudicated youth?
3. Does a combination of BASC-2-SRP clinical scale scores predict gender of adjudicated youth with clinically significant CROPS scores?

CHAPTER FOUR

Results

Descriptive Statistics

The means and standard deviations of the BASC-2-SRP subscales and CROPS are shown in Table 2. While none of the mean BASC-2-SRP subscale scores fell within the Clinically Significant category (70 or greater), results indicated that 52.5% ($N = 62$) of juvenile offenders' CROPS scores fell within the clinically significant range (19 or greater). The overall mean CROPS score of 19.3 ($SD = 9.26$) for the sample fell within the clinically significant range, with females ($M = 21.41$, $SD = 9.93$) providing higher ratings than males ($M = 17.19$, $SD = 8.08$). A t-test, t (111.41) = -2.53, $p = .013$, $d = -.39$, revealed gender differences, indicating that females scored significantly higher than males on the CROPS.

To assess whether the 26 items comprising the CROPS formed a reliable scale, Cronbach's alpha was computed. The alpha for the 26 items was .89, which indicated that the items form a scale that has good internal consistency reliability.

Table 2.
Means and standard deviations for BASC-2 clinical scales and CROPS total score ($N = 118$)

	Total	
	Mean	*SD*
Attitude to School	52.22	12.77
Attitude to Teachers	54.25	12.09
Sensation Seeking	51.19	9.75
Atypicality	49.62	10.87
Locus of Control	55.5	12.56
Social Stress	49.42	11.74
Anxiety	50.08	12.51
Depression	52.51	13.7
Sense of Inadequacy	55.56	13.03
Somatization	51.4	11.01
Attention Problems	56.18	11.85
Hyperactivity	52.5	12.38
Relation with Parents	43.05	13.02
Interpersonal Relations	52.19	9.63
Self-Esteem	50.97	10.82
Self-Reliance	45.56	10.82
CROPS Total	19.3	9.26

Research Question 1:

Is there a significant relationship on any of the clinical BASC-2-SRP scores between adjudicated youth who report trauma symptomatolgy (as measured by a score greater than or equal to 19 on the CROPS) and those who do not report trauma symptoms?

First, to assess whether a significant relationship between any of the BASC-2-SRP clinical scales and the dependent variable (clinically significant CROPS versus not clinically significant CROPS) of adjudicated youth exists, a two-tailed Bivariate Correlation ($N = 118$) was conducted. The significance value was set at ($p <= .01$) to decrease chances of error. Several BASC-2-SRP scores were significantly related to CROPS scores: Attitude to School score ($r = -.314$), Attitude to Teachers ($r = -.349$), Atypicality ($r = -.345$), Locus of Control ($r = -.416$), Social Stress ($r = -.517$), Anxiety ($r = -.508$), Depression ($r = -.451$), Sense of Inadequacy ($r = -.443$), Somatization ($r = -.424$), Attention Problems ($r = -.424$), Hyperactivity ($r = -.279$), Relation with Parents ($r = .376$), Self-Esteem ($r = .421$). No significant relationships were found between the CROPS and Sensation Seeking, Interpersonal Relations, and Self-Reliance scores. These results are displayed in Table 3.

Null Hypothesis 1: There will be no significant relationship on any of the clinical BASC-2-SRP scores between adjudicated youth who report trauma symptomatolgy (as measured by a score greater than or equal to 19 on the CROPS) and those who do not report trauma symptoms. The results indicated several significant correlations, thus, Null hypothesis 1 is rejected.

Table 3

Pearson Correlations for BASC and CROPS

(N = 118)

BASC-2-SRP scale	*CROPS*
1. Attitude to School	-.315**
2. Attitude to Teachers	-.349**
3. Sensation Seeking	-.110
4. Atypicality	-.345**
5. Locus of Control	-.416**
6. Social Stress	-.517**
7. Anxiety	-.508**
8. Depression	-.451**
9. Sense of Inadequacy	-.443**
10. Somatization	-.424**
11. Attention Problems	-.424**
12. Hyperactivity	-.279**
13. Relation w/Parents	.376**
14. Interpersonal Relations	.153
15. Self-Esteem	.421**
16. Self-Reliance	.022

**$p<.01$.

Research Question 2:

Does a combination of BASC-2-SRP clinical scale scores predict clinically significant CROPS scores (yes/no) among adjudicated youth?

Next, in order to assess if the BASC-2-SRP clinical scales successfully predict clinically significant CROPS scores (a dichotomous dependent variable), logistic regression was utilized (Pedhauzer, 1997). The BASC-2-SRP variables found to be significant in the previous correlation (Attitude to School, Attitude to Teachers, Atypicality, Locus of Control, Social Stress, Anxiety, Depression, Sense of Inadequacy, Somatization, Attention Problems, Hyperactivity, Relation with Parents, and Self-Esteem) were entered in a logistic regression to determine if they were able to successfully predict youth with clinically significant CROPS scores. The analysis also estimates the odds of probability of the dependent variable occurring based on the independent variable change (Pedhauzer, 1997).

The results of the logistic regression indicate that when all 13 predictor variables are considered together, they significantly predict whether or not a youth will report clinically significant trauma symptoms, $\chi^2 = 54.95$, $df = 13$, $N = 118$, $p < .001$. Together, the independent variables predicted 79.7% of the participants correctly. While logistic regression is not impacted by normality, linearity, and homogeneity of variance, outliers can substantially reduce the classification accuracy of the model. To evaluate the impact of outliers on the logistic regression model, a second model was run after outliers (cases with a standardized residual larger than 3.0 or smaller than -3.0) and influential cases (cases for which Cook's distance is greater than 1.0) were excluded (Hosmer & Lemeshow, 2000; Schwab, 2003). The second logistic regression model, which excluded

5 cases, $\chi^2 = 70.12$, $df = 13$, $N = 113$, $p < .001$, also indicated that the 13 predictor variables as a set reliably distinguish between youth who report clinically significant trauma symptoms and those who do not. Together, the independent variables predicted 82.3% of the participants correctly. Because the model excluding outliers and influential cases has a classification accuracy rate that is more than 2% better than the baseline model, the revised model will be interpreted. While the overall model was significant, only the social stress and somatization variables remained significant in the model. Table 4 presents the odds ratios.

A final logistic regression model was then calculated using only those variables that were significant in the revised model (social stress and somatization). There was no evidence of multicollinearity, as none of the independent variables in the analysis had a standard error larger than 2.0. The results of the final logistic regression indicated that when social stress and somatization are considered together, they successfully predict whether or not a youth will report clinically significant trauma symptoms, $\chi^2 = 61.24$, $df = 2$, $N = 113$, $p < .001$. *Cox & Snell* R^2 and *Nagelkerke* R^2, respectively, indicated that 42% or 56% of the variance in whether youth had a clinically significant CROPS score was predicted from the linear combination of the two independent variables. Together, the independent variables predicted 79.6% (90 out of 113) of the participants correctly. The variables were similarly able to predict who would report significant trauma symptoms (80%; 48 out of 60) and those who would not (79.2%; 42 out of 53). The classification table displaying the positive predictive value (specificity) and negative predictive value (sensitivity) of the model is shown in Table 5. The proportional by chance accuracy rate is the standard used to identify a logistic regression model as useful

(Hosmer & Lemeshow, 2000; Schwab, 2003). Specifically, the model must demonstrate a 25% improvement over the rate of accuracy achievable by chance alone. The proportional by chance accuracy rate was computed by calculating the proportion of cases for each group based on the number of cases in each group in the classification table at Step 0, and then squaring and summing the proportion of cases in each group (Schwab, 2003). Since the accuracy rate for the final model, 79.6%, is greater than the 62.5% by chance accuracy criteria, the logistic regression model is deemed useful in predicting group membership.

The probability of the Wald statistic for the variable social stress was 0.000, less than or equal to the level of significance of 0.05. The null hypothesis that the b coefficient for social stress was equal to zero was rejected. This supports the relationship that youth who reported greater social stress were more likely to have a significant CROPS score. The value of Exp(B) was .85, which implies that a one-point increase in social stress decreased the odds that youth would have an insignificant CROPS score by 15%. Similarly, the probability of the Wald statistic for the variable somatization was 0.002, less than or equal to the level of significance of 0.05. The null hypothesis that the b coefficient for somatization was equal to zero was rejected, supporting the relationship that youth who reported greater somatization were more likely to have a significant CROPS score. The value of Exp(B) was .89, which implies that a one-point increase in somatization decreased the odds that youth would have an insignificant CROPS score by 11%.

Null Hypothesis 2: None of the clinical BASC-2-SRP scores will predict clinically significant CROPS scores among adjudicated youth. The results of the logistic

regression indicated that social stress and somatization successfully predicted clinically significant CROPS scores, thus, Null hypothesis 2 is rejected.

Table 4.
Logistic Regression for BASC-2-SRP Predicting Clinically Significant CROPS

Variable	B	*SE*	*Odds Ratio*	*p*
Attitude to School	.000	.03	1.0	.991
Attitude to Teachers	-.014	.033	.99	.663
Atypicality	-.036	.064	.964	.568
Locus of Control	.045	.043	1.046	.299
Social Stress	-.174	.068	.840	.010
Anxiety	.005	.048	1.005	.914
Depression	-.041	.049	.404	.960
Inadequacy	-.014	.039	.986	.715
Somatization	-.114	.046	.892	.013
Attention Problems	-.059	.035	.942	.903
Hyperactivity	.049	.038	1.05	.203
Relation with Parents	-.018	.033	.982	.591
Self-Esteem	-.003	.058	.997	.959

*$p < .05$

Table 5.
Classification Table- BASC-2-SRP Predicting Clinically Significant CROPS

	Predicted		
Observed	Yes	No	% Correct
Yes	48	12	80
No	11	42	79.2
Overall Percentage			79.6

Research Question 3:

Does a combination of BASC-2-SRP clinical scale scores predict gender of adjudicated youth with clinically significant CROPS scores?

A two-tailed Bivariate Correlation was utilized to determine any significant correlations regarding gender among adjudicated youth ($N = 56$) who had clinically significant CROPS scores on the constructs of the BASC-2-SRP scales. The results indicated significant correlations with gender on the following scales: Sensation Seeking ($r = -.276$), Depression ($r = .311$), and Interpersonal Relationships ($r = -.283$). The results of this analysis are displayed in Table 6.

Next, these significant BASC-2-SRP variables were entered in a logistic regression to determine if they successfully predicted the gender of youth reporting clinically significant trauma symptoms. There was no evidence of multicollinearity, as none of the independent variables in the analysis had a standard error larger than 2.0. No outliers or influential cases were identified. Among adjudicated youth with clinically significant CROPS scores ($n = 56$), 55.4% were male ($n = 31$) and 44.63% were female ($n= 25$). The results of the logistic regression ($\chi^2 = 13.52$, $df = 3$, $N = 56$, $p < .001$) indicated that when the 3 predictor variables (sensation seeking, depression, and interpersonal relationships) are considered together, they significantly predict the gender of adjudicated youth reporting trauma symptoms. Together, the independent variables predicted 69.6% of the participants correctly. Based on *Cox & Snell* R^2 and *Nagelkerke* R^2, respectively, approximately 21.5% or 28.7% of the variance in gender of youth reporting significant trauma symptoms was predicted from the linear combination of the three independent variables. The variables were slightly better able to predict males who

would report significant trauma symptoms (74.2%; 23 out of 31) than females (64%; 16 out of 25). The odds ratios are presented in Table 7. The classification table displaying the positive predictive value (specificity) and negative predictive value (sensitivity) of the model is shown in Table 8. Again, the proportional by chance accuracy rate was computed by calculating the proportion of cases for each group based on the number of cases in each group in the classification table at Step 0, and then squaring and summing the proportion of cases in each group (Hosmer & Lemeshow, 2000; Schwab, 2003). Since the accuracy rate for the final model, 69.6%, is greater than the 63.7% by chance accuracy criteria, the model is characterized as useful.

Of the three individual independent variables, sensation seeking and depression remained significant in the model. Interpersonal relations did not. The probability of the Wald statistic for the variable sensation seeking was 0.031, less than the level of significance of 0.05. The null hypothesis that the b coefficient for sensation seeking was equal to zero was rejected. This supports the relationship that youth with clinically significant CROPS scores who reported greater sensation seeking were more likely to be male. The results suggest that there is a decrease in the likelihood of youth with clinically significant CROPS score being female for every point increase in sensation seeking scores. The value of Exp(B) was .92, which implies that a one-point increase in sensation seeking decreased the odds that youth would be female by 8%. The probability of the Wald statistic for the variable depression was 0.031, less than the level of significance of 0.05. The null hypothesis that the b coefficient for depression was equal to zero was rejected, supporting the relationship that youth who reported greater depression were more likely to be female. There is an increase in the likelihood of youth with clinically

significant CROPS scores being female for every point increase in depression scores. The value of Exp(B) was 1.13, which implies that a one-point increase in depression increased the odds that youth would be female by 13%.

Null Hypothesis 3: None of the clinical BASC-2-SRP scores will predict gender of adjudicated youth who have significant CROPS scores. The results of the logistic regression indicated that when the 3 predictor variables (sensation seeking, depression, and interpersonal relationships) are considered together, they significantly predict the gender of adjudicated youth reporting trauma symptoms. However, only sensation seeking and depression remained significant in the model. Thus, Null Hypothesis 3 is rejected.

Table 6.
Pearson Correlations for Gender and BASC Among Youth with Significant CROPS

(n = 56)

BASC-2-SRP scale	*Gender*
1. Attitude to School	.216
2. Attitude to Teachers	.135
3. Sensation Seeking	-.276*
4. Atypicality	-.012
5. Locus of Control	.165
6. Social Stress	.120
7. Anxiety	.153
8. Depression	.311*
9. Sense of Inadequacy	.179
10. Somatization	.132
11. Attention Problems	-.073
12. Hyperactivity	-.066
13. Relation w/Parents	-.107
14. Interpersonal Relations	-.283*
15. Self-Esteem	-.155
16. Self-Reliance	-.099

*p<.5.

Table 7.
Logistic Regression for BASC-2-SRRP Predicting Gender of Youth With Clinically Significant CROPS

Variable	B	*SE*	*Odds Ratio*	*p*
Sensation Seeking	-.081	.038	.922	.031*
Depression	.122	.057	1.13	.031*
Interpersonal Relations	.618	3.589	1.855	.863

*p < .05

Table 8.
Classification Table- BASC-2-SRP Predicting Gender of Youth with Clinically Significant CROPS

	Predicted		
Observed	Male	Female	% Correct
Male	23	8	74.2
Female	9	16	64
Overall Percentage			69.6

CHAPTER FIVE

Discussion

Summary of the study

Adjudicated youth who experience posttraumatic stress have a higher likelihood for recidivism; therefore, appropriate assessment and treatment is necessary to improve a juvenile's chances for successful rehabilitation. To date, few measures in existence have been normed with this population, setting, and purpose in mind. The BASC-2, popularly used among juvenile justice settings, provides some data for discrimination of clinical groups, but none is given for PTSD. Additionally, although the CROPS shows promise as a screening measure of posttraumatic symptoms in youth, further validation with juvenile offenders, as well as exploration of potential gender differences, is needed. Given the limitations of these measures, the purpose of this study was to examine the relationship between BASC-2 and CROPS scores within a sample of adjudicated youth in order to provide information relevant to psychologists and other service providers involved in the treatment and rehabilitation of adjudicated youth.

This study had several research questions:

1. Is there a significant relationship on any of the clinical BASC-2-SRP scores between adjudicated youth who report trauma symptomatolgy (as measured by a score greater than or equal to 19 on the CROPS) and those who do not report trauma symptoms?

2. Do any of the clinical BASC-2-SRP scores predict trauma symptomatology among adjudicated youth?
3. Do any of the clinical BASC-2-SRP scores predict gender of adjudicated youth who report trauma symptoms?

Conclusions

This study contributes to the increasing wealth of research documenting trauma symptomatology among juvenile offenders. Consistent with previous research (Becker & Kerig, 2011; Saltzman, Pynoos, Layne, Steinberg, & Aisenberg, 2001), this study found a high prevalence of trauma symptoms among juvenile offenders, as 52.5% ($N = 62$; $M = 19.3$, $SD = 9.26$) of CROPS scores fell within the clinically significant range. Gender differences emerged, with females ($M = 21.41$, $SD = 9.93$) reporting significantly greater trauma symptoms than males ($M = 17.19$, $SD = 8.08$), which is also congruent with previous findings (Kerig & Becker, 2012; Abram et al., 2007; Kerig, Vanderzee, Becker, & Ward, 2012). Despite the number of adjudicated youth reporting significant trauma symptoms, none of the BASC-2-SRP subscale mean scores fell within the Clinically Significant range. This finding highlights the added clinical utility of including a specific measure of trauma reactions in addition to more broad measures of behavioral and emotional functioning. This implication is consistent with the findings of Garner Evans and Oehler-Stinnett (2008). Additionally, Cronbach's alpha (.89) indicated that the CROPS scale had good internal consistency reliability.

Overview of Correlation Analyses

The current study explored the relationship between the BASC-2-SRP clinical scales and clinically significant CROPS scores. The results supported that clinically

significant self-reported trauma symptoms are associated with elevations on several BASC-2-SRP clinical scales. Specifically, elevations on the Attitude to School (r = -.314), Attitude to Teachers (r = -.349), Atypicality (r = -.345), Locus of Control (r = -.416), Social Stress (r = -.517), Anxiety (r = -.508), Depression (r = -.451), Sense of Inadequacy (r = -.443), Somatization (r = -.424), Attention Problems (r = -.424), and Hyperactivity (r = -.279) clinical scales were associated with significant CROPS scores. A negative association between the Relation with Parents (r = .376) and Self-Esteem (r = .421) scales was found with significant CROPS scores. These results suggest that adjudicated youth reporting significant trauma symptoms reported poorer attitudes toward school and teachers; greater atypicality; lower senses of locus of control; and greater social stress, anxiety, depression, somatization, attention and hyperactivity difficulties, than their non-traumatized peers. Adjudicated youth reporting significant trauma symptoms also reported less positive relationships with parents and poorer self-esteem.

The relationship between gender and BASC-2-SRP clinical scales for youth with clinically significant CROPS scores (n = 56) was also explored. A significant correlation was found between gender and the variables of Sensation Seeking (r = -.276), Depression (r = .311), and Interpersonal Relationships (r = -.283). Specifically, among traumatized youth, greater sensation seeking and poorer interpersonal relationships was associated with male gender. Greater depression was associated with female gender among traumatized adjudicated youth.

Overview of Logistic Regression

The current study investigated whether a combination of BASC-2-SRP clinical

scale scores are associated with predicting clinically significant CROPS scores. As previously mentioned, little research exists regarding detecting trauma with the BASC-2-SRP and none exists exploring the relationship between the BASC-2-SRP and CROPS. A logistic regression suggested that by combining BASC-2-SRP clinical scale scores of social stress and somatization, the overall accuracy percentage in predicting traumatized youth was 79.6, an improvement over the 62.5% rate by chance. The model was similarly able to predict who would report significant trauma symptoms (80%; 48 out of 60) and those who would not (79.2%; 42 out of 53), indicating good sensitivity and specificity. This suggests that both groups of youth responded in a relatively consistent way, making it easy to classify cases into each group. The results suggest that there is a decrease in the likelihood of an insignificant CROPS score for every point increase in social stress and somatization scores. More specifically, a one-point increase in social stress decreased the odds that youth would have an insignificant CROPS score by 15%. Similarly, a one-point increase in somatization decreased the odds that youth would have an insignificant CROPS score by 11%.

Clarification of the relationship between the BASC-2-SRP Social Stress and Somatization scale scores and trauma symptoms (as measured by the CROPS) is a start to identifying critical items and creating a potential subscale for the BASC that can assist clinicians in identifying adjudicated youth experiencing trauma reactions. Additionally, the results provide a clearer picture of the experiences of adjudicated youth reporting clinically significant trauma symptoms. Specifically, elevations on the Social Stress scale indicate feelings of tension and are associated with a lack of coping resources, especially those resulting from social support (Reynolds & Kamphaus, 2004). According to the

BASC-2 manual, the type of stress measured by this scale, compared to the Anxiety scale, tends to be chronic rather than situational. Item content endorsed on this scale reflects proneness to guilt, emotional lability, and irritability (Reynolds & Kamphaus, 2004). Elevations on the Somatization scale indicate a degree of histrionic behavior and physical complaints. Item content endorsed on this scale also tends to reflect anxiety, internalization, and repression of feeling (Reynolds & Kamphaus, 2004). Collectively, the content of the Social Stress and Somatization scales are consistent with the symptoms described by current childhood trauma literature, such as feelings of social isolation and betrayal, chronic affect dysregulation, emotional numbing/avoidance, and somatic complaints (Resick et al., 2012; Cook et al., 2005; Briere et al., 2010).

A second logistic regression suggested that by combining BASC-2-SRP clinical scale scores of sensation seeking, depression, and interpersonal relationships, the overall accuracy percentage in predicting the gender of adjudicated youth with significant CROPS scores was 69.6, an improvement over the 63.7% rate by chance. The model was slightly better able to predict males who would report significant trauma symptoms (74.2%; 23 out of 31) than females (64%; 16 out of 25). This suggests that males experiencing significant trauma symptoms responded in a more consistent manner than did females, making it easier to classify these cases into the correct group. Review of the individual independent variables indicated that only sensation seeking and depression met statistical significance, suggesting that these variables contributed significantly to the predictive ability of the model. Interpersonal relations did not significantly contribute to the model. More specifically, the results suggest that the greater the sensation seeking score, the more likely the individual with a clinically significant CROPS score is male.

There is a decrease in the likelihood of youth with clinically significant CROPS score being female for every point increase in sensation seeking scores. As the sensation seeking scale score increases by one point, the odds of the youth being female decreases by 8%. The results also suggested that the greater the depression score, the more likely the individual with a clinically significant CROPS score is female. As the depression score increases by one point, the odds of the youth being female increases by 13%.

The results of this analysis indicate some gender differences in trauma symptomatology. For adjudicated youth experiencing trauma reactions, higher degrees of sensation seeking were more likely to occur in males. Item content endorsed on this scale reflects a tendency towards risk taking, impulsivity, argumentativeness, and substance use (Reynolds & Kamphaus, 2004). These results are consistent with findings of Becker and associates (2012) that adjudicated males report greater substance use than females. Based on affective theories linking trauma and delinquency, increased sensation seeking behavior among delinquent males could be related to emotional numbing and diminished fear in the context of high posttraumatic arousal (Allwood, Bell, & Horan, 2011; Kerig, Bennett, Thompson, & Becker, 2012). With respect to cognitive models, externalizing behavior among traumatized adjudicated males may be the result of shame, anger, and cognitive priming towards aggression (Feiring et al., 2007; Dodge, Petit, Bates, & Volente, 1995). From an integrative perspective (Ford et al., 2006), these youth may be attempting to cope "by any means necessary" via masks of callousness and defiance.

On the other hand, higher degrees of depression were more likely to be reported by females. These implications are likely related to previous findings that interpersonal traumas are more common for females (Kerig et al., 2011; McCabe et al., 2002), who

also tend to report higher levels of internalizing symptoms compared to males (McCabe, Lansing, Garland, & Hough, 2002; Teplin et al., 2002; Grande, Hallman, Underwood, Warren, & Rehfuss, 2012). These results seem logical, given that female delinquency behavior is typically related to coping with traumatic experiences (Kerig & Becker, 2012).

Limitations

Several limitations to the current study should be noted. First, the sample in this study was court referred and represents a small demographic area, which may limit the generalizability of the results. Future studies continuing this line of inquiry require larger sample sizes to investigate differences that may exist based on variables such as ethnicity/race, offense, and age. In addition, the study's reliance on self-reports of youth may introduce some error. While invalid profiles were identified using the validity scales on the BASC-2-SRP, no such strategy for identifying potentially biased or inconsistent responding is available for the CROPS. Furthermore, the possibility exists that youth may respond in an inconsistent manner that does not meet threshold to deem the profile invalid. Finally, while the sample was size adequate for final analysis, according to Hosmer and Lemeshow (2000), the guideline of 10 cases per independent variable is in reference to the total number of variables screened for analysis, not only those included in the final model. Despite these limitations, significant results were found.

Implications

This study has several clinical implications. Given the findings of the current analyses, the documented high prevalence of trauma among adjudicated youth (Becker & Kerig, 2011), and the link between posttraumatic stress and recidivism (Becker, Kerig,

Lim, & Ezechukwu, 2012), clinical practitioners would be wise to utilize measures of trauma with all youth involved in the justice system. Assessing for posttraumatic symptoms upon entrance into the juvenile justice system can help inform mental health treatment, as well as illuminate potential factors influencing delinquency behavior. The identification of trauma symptoms can assist clinicians and juvenile justice professionals with person-centered conceptualizations regarding the experiences of youth. Better understanding of their experiences may enable professionals to better manage barriers to rehabilitation, as well as increase compassion and empathy.

In regards to assessment, the results of this study add further support for the validity of the CROPS, which provides the advantages of low cost and ease of administration to the screening process. As youth may be resistant to report exposure to adverse events or may not identify an event as traumatic, a measure such as the CROPS provides great utility as it allows for the endorsement of posttraumatic symptoms without requiring reporting of specific events (Greenwald & Rubin, 1999; Kerig & Bennett, 2013). Based on the high prevalence of chronic adverse experiences among adjudicated youth (Abram et al., 2004; Wood et al., 2002; Coleman, 2005) and research demonstrating the difficulty youth encounter in reporting these types of experiences (Kerig, Moeddel, & Becker, 2011; Dembo, Schmeidler, & Childs, 2007), this characteristic may make the CROPS especially useful with this population.

In regards to treatment implications, trauma-informed systems are paramount (Ford & Blaustein, 2013). This study found a positive relationship between trauma symptoms and greater impairment in relationships with parents, as well as poorer attitudes towards school and teachers. These impairments may be particularly relevant to

the nature of youths' involvement in the justice system (i.e., truancy, runaway, altercations in the home), regardless of whether the impairments are a precipitating factor or result of delinquent behavior (Dembo, Schmeidler, & Childs, 2007). The role of familial instability in the trauma exposure and delinquency behaviors of adjudicated youth should not be overlooked; mental health and rehabilitation interventions may need to focus on parents as well as youth. Addressing relationships with caregivers via family interventions may be necessary to construct safe, consistent, and responsive environments in which youth can thrive (Ford, Chapman, Mack, Pearson, 2006). Psychoeducation and training for parents, teachers, and juvenile justice professionals may also increase understanding of the impact of trauma on youth, decrease stigmatization of this population, and increase appropriate referrals for trauma-informed and/or trauma-focused interventions (Maschi & Schwalbe, 2012). Trauma Affect Regulation: Guide for Education and Therapy (TARGET; Ford & Saltzman, 2009) is an example of an education and skills training intervention that promotes a recovery-based atmosphere among juvenile justice, school, and other social environments.

This study also found that trauma symptoms among adjudicated youth were associated with a poorer sense of adequacy, self-esteem, and locus of control. Additionally, these youth may report greater difficulties with anxiety, social stress, depression, somatization, and atypicality. They may also have greater difficulties with attention and hyperactivity than their non-traumatized peers, further impeding their ability to engage and respond appropriately across academic and other settings. Thus, comprehensive interventions that focus on the array of trauma reactions experienced by adjudicated youth should be utilized. Trauma-focused cognitive-behavioral therapy

(Cohen, Marrarino, & Deblinger, 2006) has demonstrated efficacy in reducing PTSD, depression, and behavioral problems among youth (Cohen, Deblinger, Mannarino, & Steer; 2004; Deblinger, Mannarino, Cohen, Runyon, & Steer; 2011). A strength of this approach is that it can be used with youth experiencing complex trauma (Cohen, Marrarino, Kliethermes, & Murray; 2012). This approach includes both youth and caregivers in treatment that encompasses the following components: psychoeducation; parenting skills; stress management; emotional regulation; cognitive coping; trauma narration; in vivo exposure; conjoint parent-child sessions; and focus on future development and safety. Interventions that include career development and skills training may also positively impact sense of agency and future-orientation, which may assist in increasing positive behaviors and engagement in academic settings (Fitzgerald, Chronister, Forrest, & Brown, 2013; Cabrera, Auslander, & Polgar, 2009). Future research should evaluate the efficacy of these types of interventions specifically with adjudicated youth. Additionally, pharmacological interventions can significantly improve affect regulation and interpersonal relations (van der Kolk, Dreyfuss, Michaels, Shera, Berkowitz, Fisler, & Saxe, 1994), which have both been highlighted by multiple researchers as being central in both trauma reactions and delinquency (Ford, 2002; Kerig & Bennett, 2013, Ford et al., 2006).

The greater incidence of trauma symptoms among adjudicated females as compared to males in this study also lend additional support to the argument that trauma-informed treatment is particularly important for females involved in the juvenile justice system (Kerig, Vanderzee, Becker, & Ward, 2012; Kerig & Becker, 2012; Foy, Ritchie, & Conway, 2012). Gender-specific programming is needed to address the unique needs

of adjudicated females (Grande, Hallman, Underwood, Warren, & Rehfuss, 2012), who are at a greater risk to develop posttraumatic stress disorder, may be exposed to more interpersonal traumas than males, and whose delinquency behavior is typically related to coping with traumatic experiences (Kerig & Becker, 2012). Given the relational nature of females and the fact that their trauma experiences tend to occur within the context of a relationship (Kerig, Ward, Vanderzee, & Moeddel, 2009; Kerig & Becker, 2012), interventions that promote interpersonal and emotional regulation skills may be beneficial. A review by Zahn, Daym, Mihalic, and Tichavsky (2009) found only nine adolescent treatment programs designed for females, with two comprehensive programs evidencing favorable outcomes on a variety of risk factors for delinquency. Future research should focus on the development of gender-specific trauma assessments and interventions specifically for the juvenile offender population with particular attention to potential differences based on factors such as age and culture.

Recommendations for Future Research

Together, the results of this study underscore the importance of trauma assessment and programming in all juvenile justice settings in order to treat and prevent exacerbation of underlying trauma reactions. Additional research is needed to develop culturally sensitive, gender-specific assessment and intervention approaches for use with traumatized adjudicated youth. First, the sample in this study was court referred and represents a small demographic area, which may limit the generalizability of the results. Future studies continuing this line of inquiry require replication with larger sample sizes to investigate differences that may exist based on variables such as ethnicity/race, offense, and age. Furthermore, cross-validation is necessary to be sure that the model is

not overfitting the data (Hosmer & Lemeshow, 2000). While the prediction equation may describe the relationship between the variables of interest, it may be an over-estimate.

Based on the results of this study, future researchers may attempt to construct a trauma subscale based on critical items found in the BASC-2-SRP Social Stress, Somatization, and other scales. Adding such a feature to the BASC may further alert clinicians to adjudicated youth potentially experiencing trauma reactions. While the results of the current prediction models are intriguing, the degree of precision needed to identify traumatized youth is not yet evident. According to Sedlak (1988), the real predictive value of a measure is a function of its sensitivity, specificity, and the prevalence of the variable being measured. Specifically, predictive value = (prevalence x sensitivity) ÷ ((prevalence x sensitivity) + (1- prevalence) (1 – specificity)). In this study, the first model resulted in 79.2 % sensitivity, 80% specificity, with a 52.5% prevalence rate for clinically significant trauma symptoms among adjudicated youth. Based on Sedlak's (1988) formula, the positive predictive value of the logistic regression model is 50.54%. In other words, if clinicians were to use the prediction model, which is accurate 80% of the time, to identify youth with posttraumatic symptomatology, one would be accurate half of the time. This finding again highlights the current value of utilizing specific measures of trauma reactions and multi-modal approaches in assessing the functioning of adjudicated youth. Future researchers should continue to strive to create more sensitive and specific models of prediction.

Another important direction in future research is testing for measurement equivalence of the CROPS across various populations. While the current study provides additional data on the reliability of the consistency of the CROPS, it does not offer

evidence about the consistency of the factors of the construct (e.g. posttraumatic stress reactions among youth) the CROPS purposes to measure. Therefore, without evidence of measurement equivalence, between-group comparisons may not be clinically meaningful and such comparisons should be considered with caution (Miller & Sheu, 2008). Future research should investigate the measurement equivalence of the CROPS.

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