ABSTRACT

INVESTIGATING THE LINKS BETWEEN TRAUMA AND BOYS’ DELINQUENCY: THE ROLES OF FATHER-SON ATTACHMENT AND ALIENATION

by Stephen P. Becker

Research has shown that a high percentage of detained youths have experienced trauma and have elevated rates of posttraumatic stress disorder (PTSD) compared to their community peers. However, research has just begun to explore the mechanisms that might account for the link between trauma and delinquency. The present study investigated the roles of father-son attachment and alienation in understanding the relationship between posttraumatic symptomatology and delinquency among a sample of 89 boys in a juvenile detention center. Results indicate that 95% of participants experienced trauma, and 20% met criteria for Full or Partial PTSD. Although PTSD was associated with delinquency, attachment to father and alienation did not significantly contribute to understanding this association. Post-hoc analyses revealed that attachment to father moderated the relationship between trauma exposure and alienation, whereas attachment to mother moderated the relationship between trauma exposure and PTSD symptoms. Implications for research within juvenile justice populations are discussed.
INVESTIGATING THE LINKS BETWEEN TRAUMA AND BOYS’ DELINQUENCY:
THE ROLES OF FATHER-SON ATTACHMENT AND ALIENATION

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Dedication

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Investigating the Links Between Trauma and Boys’ Delinquency: The Roles of Father-Son Attachment and Alienation

Juvenile delinquency has a tremendous impact on a youth’s life course, disrupts family relationships, and comes with significant social and economic ramifications. In 2008 alone, over 1.6 million adolescent arrests occurred, comprising approximately 15% of all arrests in the United States (U.S. Department of Justice, 2009). Historically, males have been much more likely to be delinquent and currently account for 70% of all juvenile arrests (U. S. Department of Justice, 2009). Males are also more likely than females to engage in various types of serious and violent delinquency (Booth, Farrell, & Varano, 2008; Elliott, 1994; Fagan, Van Horn, Hawkins, & Arthur, 2007; Johnson, 1987). Increasing efforts have focused on understanding the causes of delinquency, as prevention and intervention efforts must be guided by the accumulating scientific knowledge of the precursors, etiology, and developmental pathways to juvenile delinquency (Lahey, Moffitt, & Caspi, 2003).

Developmental psychopathology offers a particularly useful framework for examining delinquency (Frick & Viding, 2009). To begin with, developmental psychopathology prioritizes an understanding of normative development, and psychopathology is understood as deviations from normality (Kerig & Wenar, 2006; Sroufe, 1997). Also, developmental psychopathology emphasizes both equifinality and multifinality (Cicchetti & Rogosch, 1996). Whereas equifinality refers to the diversity of causes that may lead to a similar outcome, multifinality recognizes that a single cause may lead to multiple outcomes. Likewise, it is the developmental trajectory that is important to understand, as opposed to only those behaviors seen at one particular point in time (Sroufe, 1997). For example, some degree of antisocial behavior is relatively common in adolescence, although large differences exist between the majority of youth who engage in adolescent-limited antisocial behaviors and the small percentage of youth whose antisocial behaviors begin early in development and worsen throughout childhood and adolescence (Moffitt, 1993, 2003). Concomitantly, research has shown that whereas aggression may be a genetically-stable trait, delinquency in adolescence is considered to be more strongly influenced by environmental factors (Eley, Lichtenstein, & Moffitt, 2003; Taylor, Iacono, & McGue, 2000).

Recently, particular attention has been given to the role of trauma in understanding the pathway to juvenile delinquency (Greenwald, 2002; Kerig, Ward, Vanderzee, & Arnzen
Moeddel, 2009; Steiner, Garcia, & Matthews, 1997). Although trauma and posttraumatic symptomatology are both associated with delinquency, continued research is needed to understand the mechanisms linking posttraumatic symptoms to delinquency (Kerig & Becker, 2010). The purpose of the present study is to examine the interrelationships among trauma, parental attachments, alienation, and delinquency, and to consider potential mediators and moderators in particular, thus contributing to the scientific knowledge of pathways to delinquency among male adolescents.

**Trauma and Delinquency**

It is clear that the experience of trauma plays a powerful role in the course toward delinquency for some youth (Abram et al., 2004; Greenwald, 2002; Kerig & Becker, 2010; Smith & Thornberry, 1995), and, compared with normative samples, youth in juvenile detention facilities are significantly more likely to have witnessed or been personally victimized by familial or communal violence (Abram et al., 2004; Wood, Foy, Layne, Pynoos, & James, 2002). Specifically, although estimates of PTSD prevalence in a normative population of male youth range from 4-9% (Kessler et al., 1994; Kilpatrick et al., 2003), youth within a juvenile detention facility are as much as eight times more likely to have posttraumatic stress disorder (Wolpaw & Ford, 2004). Specifically, the prevalence of PTSD among detained adolescents is as high as 32% among boys and 52% among girls, although prevalence rates differ widely across samples, detention settings, and measures utilized (see Kerig & Becker, in press, for a review).

In an examination of the role of interpersonal traumas and violence in incarcerated youth, Ford (2002) concluded that incarcerated youth who had committed violent offences were more likely to have histories of experiencing violent traumas, and physical or sexual abuse has been linked to both PTSD and antisocial behavior in both males and females (Boney-McCoy & Finkelhor, 1995; Silverman, Reinherz, & Giaconia, 1996). Indeed, the detrimental psychological and social effects of PTSD on a youth’s normative developmental trajectory are pronounced (Boney-McCoy & Finkelhor, 1995; Pynoos, 1993; Silverman et al., 1996; van der Kolk, 2005; Veysey, 2008), and PTSD is often comorbid with other psychological disorders (Carrion, Weems, Ray, & Reiss, 2002; Kilpatrick et al., 2003; Weinstein, Staffelbach, & Biaggio, 2000). Nader (2008) highlights the impact of trauma on a youth’s core self: “Trauma can wound the personal spirit by interrupting the life that would have been and the self that was, distorting and
undermining self-confidence and self-concept, and altering the youth’s relationships to others and the environment” (p. 26, italics added).

Among adolescents, PTSD may interfere with normative developmental tasks such as identity and personality development, the beginning of romantic relationships, and sexual identity development, as well as future-oriented tasks such as academic or vocational choices (Becker & Kerig, in press). Normative development in adolescence, as the transitional period between childhood and adulthood, is already ripe with confusion and turbulence, and thus, normative developmental tasks are “further confounded and exacerbated by traumatic experiences” (Rojas & Lee, 2004, p. 247). Concomitantly, posttraumatic symptoms in adolescence are associated with academic problems (Giaconia et al., 1994; Lipschitz, Rasmusson, Anyan, Cromwell, & Southwick, 2000; Saigh, Mroueh, & Bremner, 1997), as well as risky behaviors such as dating victimization (Fowler et al., 2009; Lipschitz et al., 2000; Saigh et al., 1997), running away (Whitbeck, Hoyt, & Ackley, 1997; Whitbeck, Hoyt, Johnson, & Chen, 2007), suicidal or other self-harming behaviors (Giaconia et al., 1995; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Lipschitz, Winegar, Hartnick, Foote, & Southwick, 1999), and self-medication through the use of alcohol or other substances (Kilpatrick et al., 2000; Mills, Teeson, Ross, & Peters, 2006), all of which may place youth at increased risk for involvement with the juvenile justice system.

However, although a link between PTSD and delinquency has been established, the framework of developmental psychopathology emphasizes the need to explore and understand the various mechanisms that may account for this link. Recently, Kerig and Becker (2010) explicated various theoretical models of the processes linking PTSD to juvenile delinquency, many of which have not yet undergone direct empirical testing. Research is needed to examine various models that account for the PTSD-delinquency relationship as they may guide not only the theoretical and conceptual understanding of the link between trauma and delinquency, but also meaningfully inform prevention, intervention, and policy efforts.

**Attachment and Delinquency**

Attachment is an organizational system that provides a template for understanding the ways in which early relational experiences may impact development across the life span (Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006; Sroufe & Waters, 1977). Foundational to attachment theory is the way in which patterns of caregiver-child interactions contribute to the development of an
internal working model of attachment, which organizes and directs a child’s expectations of themselves in relation to others and their surrounding environment. The majority of children develop a secure attachment (Aikins, Howes, & Hamilton, 2009; Ammaniti, van IJzendoorn, Speranza & Tambelli, 2000), which is the result of responsive, nurturing, and sensitive caregiving. For children with a secure attachment, the world is approached with a sense of predictability and safety, which allows these children to develop a basic sense of trust and confidence in their abilities to elicit care and meaningfully engage in and contribute to the world around them. In contrast, some children experience early caregiving relationships that are characterized by inconsistency, unpredictability, deprivation, or abuse, and these relational patterns contribute to a sense of mistrust whereby it is expected that others will be unresponsive to or rejecting of their needs (Cicchetti & Howes, 1991; Weinfield, Sroufe, Egeland, & Carlson, 2008). As a result of living in a world that is perceived as unsafe and unpredictable, these youth are set on a developmental trajectory that is prone to emotional distress, negative peer relationships, distrust of authority, and a sense of injustice in the world. Taken together, although an insecure attachment in childhood is not deterministic of all future relationships and functioning, youth with an insecure attachment may have particular difficulty adapting to normal developmental tasks throughout childhood and adolescence, and they are at increased risk for a variety of social and mental health problems (Carlson & Sroufe, 1995; DeKlyen & Greenberg, 2008; Kerig & Wenar, 2006; Sroufe, 1997; Sroufe, Egeland, Carlson, & Collins, 2005).

Early in the development of attachment theory, Bowlby (1944) proposed a link between child-caregiver relationships and delinquency in his seminal article on “forty-four juvenile thieves” in London, England. Although Bowlby (1969) theorized that “during adolescence, a child’s attachment to his parents grows weaker,” he emphasized that “for most individuals the bond to parents continues into adult life and affects behaviour in countless ways” (p. 207). Allen and colleagues (Allen, Moore, & Kuperminc, 1997), while acknowledging the significant role that peers play in the development of delinquency alongside increasing autonomy in adolescence (Moffitt, 1993), also emphasize that “one of the most significant gains in research on adolescent autonomy…has been the recognition that such autonomy optimally is developed not at the expense of relationships, but rather in the context of close, supportive relationships with parents” (Allen et al., 1997, p. 551; italics in original). In support of this statement, there is evidence to suggest that delinquent peers do not usurp an adolescent’s parental relationships, as parent-child

Hirschi’s (1969) social control theory also draws from the role of attachment in the development of delinquency. Social control theory posits that various social bonds serve as buffers from the development of delinquency; whereas each person has the same potential for delinquency, those with weak social bonds are more likely to deviate from social and conventional norms and engage in delinquent behavior (Hirschi, 1969). In Hirschi’s (1969) theory, the four social bond concepts that form a foundation for social control are commitment, involvement, belief, and attachment, which, along with Bowlby, highlights the important role of attachment in the development of juvenile delinquency. Indeed, there is a significant body of research that shows that youth who lack security in their parental attachment are more likely to engage in delinquent behaviors (Allen, Aber, & Leadbeater, 1990; Allen, Moore, Kuperminc, & Bell, 1998; Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Cooper, Shaver, & Collins, 1998; Marcus & Betzer, 1996) whereas a secure parental attachment is considered a protective factor (Allen, 2008; Benda & Corwyn, 2002; Heimer & De Coster, 1999; Huebner & Betts, 2002; Stouthamer-Loeber et al., 1993).

More specifically, Allen and colleagues (Allen et al., 1998, 2002; McElhaney, Immele, Smith, & Allen, 2006) found that a preoccupied attachment style was associated with delinquency in a moderately at-risk community sample of adolescents, and the authors suggest that delinquent behaviors among preoccupied youth may actually serve an attachment function. While delinquent behaviors may be displays of anger and anxiety consistent with attachment preoccupation, offending and attention-seeking behaviors may “also serve as an attempt, albeit dysfunctional, to maintain the intensity of the parent-teen bond” (Allen et al., 2002, p. 57). Conversely, Rosenstein and Horowitz (1996) found the psychiatrically hospitalized youth with a dismissing attachment classification were more antisocial than preoccupied youth, and a dismissing attachment style was also associated with a diagnosis of conduct disorder. Likewise, Aguilar and colleagues (Aguilar, Sroufe, Egeland & Carlson, 2000) found that attachment avoidance in infancy was longitudinally associated with antisocial behavior among high risk adolescents, extending earlier research linking avoidant attachment and behavior problems among younger children (Greenberg, Speltz, & DeKlyen, 1993; Sroufe, 1983). Interestingly, Wekerle and Wolfe (1998) found that although both avoidant and anxious/ambivalent attachment
styles were associated with adolescent offending among high school students, attachment did not uniquely predict offending behavior beyond the contribution of childhood maltreatment. Thus, although research demonstrates that an insecure attachment is associated with adolescent delinquency, there is much that remains in understanding this relationship, and in addition to the area of trauma and PTSD symptoms, it is important to consider the differential attachments to father and mother.

**Unique Role of Father-Son Attachment**

Several studies have sought to examine the unique ways maternal or paternal attachment may contribute to delinquency. Nye (1958) and Gold (1963) both hypothesized that the traditional disciplinary and modeling role of the father would be a stronger influence than the mother in discouraging and inhibiting delinquency. Building on the theories of Nye (1958), Gold (1963), and Hirschi (1969), Johnson (1987) found that whereas both males and females were more securely attached to their mother than their father, the relationship with the father was more predictive of delinquency than the relationship with the mother, and this was particularly true for boys. Using a sample of 734 adolescents, Johnson found that males had higher levels of self-reported delinquency than females, but this finding was not due to sons having weaker bonds with their parents than did daughters. Rather, theft, vandalism, and assault were all more predicted by a youth’s emotional distance from the father than the mother, leading Johnson to conclude, “Even though a youth’s relationship with mother is generally more emotionally satisfying, there seem to be aspects of father’s role that supersede affection in influencing delinquency” (p. 313). Whereas Johnson’s early study of the unique contributions of mother and father attachments in the development of male and female delinquency is important, further research is needed to clarify these results, particularly given Johnson’s use of a non-validated measure of attachment.

Some more recent research has also focused on how father and mother attachments may uniquely impact delinquency (Booth et al., 2008; Elgar, Knight, Worrall, & Sherman, 2003; Hoeve et al., 2009), and although there is some evidence that a secure parental attachment is a protective factor for girls more than for boys (Heimer & De Coster, 1999; Huebner & Betts, 2002), other researchers conclude that parental attachment actually affects boys more than girls (Canter, 1982; Krohn & Massey, 1980; Seydlitz, 1991; Wallace & May, 2005). Specifically, Thornberry and colleagues (Thornberry, Krohn, Lizotte, Smith, & Tobin, 2006), in examining
the odds of joining a gang, found that the quality of the parent-child relationship was more important for males than females. In another recent study, Booth and colleagues (2008) found evidence suggesting that parental attachment uniquely decreased the risk for serious delinquency for males but not for females. Similarly, although they did not directly assess the construct of attachment, Bronte-Tinkew, Moore, and Carrano (2006) did find that a positive father-child relationship is negatively associated with delinquency even after controlling for the impact of the mother-child relationship. This positive father influence was also stronger for boys than girls, leading the researchers to conclude that “the father-child relationship is more protective against risk behaviors for males as opposed to females” (p. 877).

In seeking to consider both the quantity and quality of the father-adolescent relationship in intact families, Harris, Furstenberg, and Marmer (1998) examined fathers’ involvement and level of closeness with adolescent children and found that both of these factors combined “protect adolescents from engaging in delinquent behavior and experiencing emotional distress” (p. 214). Research has also shown that although a secure attachment to female caregivers is inversely related to violence, this is true only for young adolescents (less than 16 years of age), whereas attachment to male caregivers is predictive of violence for both younger and older adolescents (Benda & Corwyn, 2002).

Additionally, although adolescents generally report being more supported by and closer to their mothers than to their fathers (Hosley & Montemayor, 1997; Youniss & Smoller, 1987), there is research that suggests a unique aspect of the father-son relationship (Fagan et al., 2007; Hoeve et al., 2009) and the possibility that adolescent sons may look to their fathers for guidance more than their mothers (Hoeve et al., 2009; Richardson, Galambos, Schulenberg, & Petersen, 1984). Also, fathers are often more engaged with their sons than their daughters (Harris et al., 1998; Hosley & Montemayor, 1997), suggesting that the availability of fathers may be an important factor in understanding the trajectory of youth behavior problems.

In fact, externalizing problems among boys have been linked to the relationships with and availability of adult males (Hoeve et al., 2009). Pierce (1999, as cited in Sroufe et al., 2005, pp. 191-192) found that a disruptive male presence throughout early childhood predicted adolescent externalizing problems, and an unstable adult male presence was worse than having no male presence at all. Likewise, in a Chinese sample, Yang, Wang, Li, Teng and Ren (2008) found that father parenting was predictive of sons’ subjective well-being, leading Yang and colleagues to
assert that “the father-son relationship is more influential to young men’s affect and subjective well-being than is the mother-son relationship in the sense that boys were significantly affected by the warmth from their father” (p. 1375). Indeed, Lamb and Lewis (2004) emphasized that, “in the long term, patterns of father-child closeness might be crucial predictors of later psychosocial adjustment, although the patterns of influence remain to be explored in depth” (p. 291). These patterns of closeness—reflecting one aspect of the attachment system—must be examined in light of the unique way attachment transitions from childhood to adulthood through adolescence.

**Attachment in Adolescence**

In examining attachment in adolescence, it is also important to clarify precisely *what* constitutes attachment and *how* this attachment is being assessed. A central tenet of attachment theory is that although attachment develops in the context of specific dyadic relationships (e.g., father-child or mother-child), the attachment system will coalesce into an attachment “state of mind” as development proceeds (Allen, 2008; Sroufe & Waters, 1977). Although attachment may thus be examined in the context of a broader attachment state of mind, it is also important to consider the dyadic attachment relationships in adolescence. Allen (2008) highlights this distinction, stating, “Primary attachment relationships continue in adolescence, develop dramatically, and provide important issues worthy of study” (p. 420). Furthermore, although the potential for an attachment state of mind becomes more evident throughout adolescence as youth are able to develop attachment relationships with peers and romantic partners (Ainsworth, 1989; Bowlby, 1969), “it is exquisitely difficult for a teen to strike out from his or her parents and establish independence while feeling pulled by both habit and the attachment system to retain their shoulders to cry on” (Allen, 2008, p. 421). Given the differences between an attachment state of mind and a dyadic attachment relationship, researchers need to clarify their conceptualization of attachment and the conclusions drawn from such conceptualization and subsequent methodologies.

This study seeks to examine the dyadic attachment relationships between an adolescent and his mother and father, particularly given that the majority of the research in the area of attachment and delinquency has been conducted by assessing attachment state of mind with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996) or non-validated measures of dyadic attachment. It is clear that adolescents continue to seek out specific attachment figures
when distressed (Steinberg, 1990), and it is precisely during times of distress that adolescents are most likely to seek out and need the security and safety of a strong parental attachment, and the distress which accompanies trauma certainly warrants the need and opportunity for parents to provide support, comfort, and a trusted shoulder. As the research suggests a unique role of the father in the lives of male youth, it is plausible to expect that security in attachment to father may play a unique role in the link between trauma and delinquency.

However, a focus on the role of attachment to father in the pathway from trauma to delinquency leaves open an additional question that warrants attention in the present study. Why is it that security in attachment to father might play a role between trauma and delinquency? Although certainly not all youth who are insecure in their attachments to their fathers find themselves on a trajectory toward delinquency, the concept of multifinality suggests that there may indeed be multiple outcomes stemming from the same source. For youth who do not have a secure attachment—and particularly for boys who do not have positive relationships with their fathers—the world becomes untrustworthy and unpredictable, and so there are some youth who may begin to consistently approach the world around them with alienation and isolation.

**Alienation and Delinquency**

Although alienation has received multiple definitions across diverse research areas, persons who are alienated have been described as experiencing normlessness, powerlessness, isolation, loss of meaning, and estrangement from both society and self (Lacourse, Villeneuve, & Claes, 2003; Roberts, 1987; Seeman, 1959). Sixty years ago, Horney (1950) theorized that alienation—and the associated perceptions of powerlessness and isolation—may contribute to the development and persistence of antisocial behavior. In support of this, high levels of alienation have been found among incarcerated youth (Calabrese & Adams, 1990), particularly as juvenile justice-involved youth “represent the extremes among young people who are estranged from, and at the margins of, society” (Bailey, 1996, p. 6). Likewise, given that alienation is most particularly associated with powerlessness and self-estrangement (Lacourse et al., 2003), it is not surprising that alienation has been linked to fear of criminal victimization (Wallace & May, 2005), adolescent violence (Benda & Corwyn, 2002), and emotional and behavioral problems (Coley, 2003). A direct link between alienation and delinquency has also been found. Sankey and Huon (1999) tested various mediational models with an Australian sample of 152 adolescents and found alienation to be among several variables predictive of delinquency, with
higher levels of alienation associated with higher levels of delinquent behavior.

In addition to alienation being associated with juvenile delinquency, alienation may also be related to posttraumatic symptomatology. Indeed, individuals with PTSD may have views of self that are defined by a sense of powerlessness and isolation, and O’Donnell, Schwab-Stone, and Ruchkin (2006) noted that PTSD symptoms bear resemblance to the features of alienation defined by isolation and self-estrangement. Alienation was also found to be associated with both childhood maltreatment and antisocial behavior by researchers at the University of Minnesota’s Institute of Child Development (Egeland, Yates, Appleyard, & van Dulmen, 2002). In their study, Egeland and colleagues viewed alienation as a function of attachment, as alienation may develop when there is a “lack of trust in the caregiver’s availability, support, and guidance, particularly in stressful situations in which the child needs support and assistance from the caregivers to cope effectively” (Egeland et al., 2002, p. 251). They found that alienation was an important factor in explaining the relationship between child maltreatment and externalizing behaviors in adolescence and concluded that “alienation is a probable consequence of maltreatment that appears to be part of the process leading to an early-onset externalizing trajectory” (Egeland et al., 2002, p. 257). This longitudinal study provides strong support for the role of alienation, developed out of poor attachment relationships, to be instrumental in the pathway to delinquency in a high-risk sample. However, the present study will build on Egeland and colleagues’ study in three important ways. First, Egeland and colleagues studied only physical abuse and emotional neglect in childhood, which leaves a wide variety of other traumatic experiences unexamined. Particularly, high proportions of delinquent youth report community violence as both prevalent and distressing (Kerig et al., 2009). Second, alienation in the Egeland and colleagues study was understood within an attachment framework, although it is also possible that attachment and alienation can be conceptually distinct, whereby the former focused on interpersonal relationships and the latter emphasizes distrust and alienation toward society more broadly. Third, although Egeland and colleagues measured antisocial behavior in a high-risk community sample, the present study seeks to test the role of alienation in a unique and particularly vulnerable population, namely, youth in a juvenile detention facility. For these youth, the ramifications of their behaviors come with significant personal, familial, and social ramifications, and there is little understanding of how trauma, differential parental attachments, and alienation may be interrelated for this population of male adolescents.
The Roles of Moderators and Mediators

Taken together, alienation and insecurity of attachment to father may contribute to our understanding of the relationship between trauma and delinquency. Mediators and moderators are two ways of testing various developmental pathways and associations between variables (Baron & Kenny, 1986; Holmbeck, 1997), and both moderational and meditational effects are examined in the current study. Although conceptually distinct from one another, both moderator and mediator variables are third variables that contribute to an understanding of the relationship between two other variables. Specifically, a mediator is a variable that “transmits the effect of an independent variable on a dependent variable” (MacKinnon, 2008, p. 8). Stated another way, a mediating variable (M) is conceptualized as *an intermediate variable in a causal chain*, whereby the relationship between two other variables (X and Y) might be better understood by a chain such that X causes M and M causes Y. Thus, it is through the mediator that the independent variable effects the dependent variable (Baron & Kenny, 1986; Holmbeck, 1997; MacKinnon, 2008). In contrast to having a causal role, a moderator is a variable that “affects the relationship between two variables, so that the nature of the impact of the predictor [independent variable] on the criterion [dependent variable] varies according to level or value of the moderator” (Holmbeck, 1997, p. 599). So, it is possible that a moderating variable may not be associated with a dependent variable, but rather, *may influence the degree or direction* of the relationship between two other variables of interest.

Salzinger, Rosario, and Feldman (2007) provide one relevant example of testing both moderational and meditational effects in the study of the relationship between abuse and delinquency. In their study, Salzinger and colleagues examined the way in which personal relationships with peers and parents might mediate or moderate the link between physical child abuse and adolescent violent delinquency. Using a matched sample of 100 physically abused youth and 100 nonabused classmates, attachment to parents, as well as physical and verbal abuse in relationships with parents during adolescence, mediated the relationship between childhood physical abuse and violent delinquency in adolescence. In contrast, peer relationships moderated, rather than mediated, childhood abuse and adolescent delinquency, whereby for abused youth, low levels of delinquency among peers decreased the risk for violent behavior while abusive behavior with best friends exacerbated this risk.
Whereas Salzinger and colleagues (2007) provide evidence that attachment to parents lessened the risk for violent delinquency and may serve as “a protective factor against poor outcome in the face of early abuse” (p. 217), additional research is needed to clarify these findings. For instance, Salzinger and colleagues focused on physical sexual abuse, but it remains unclear the extent that parental attachment may moderate or mediate the relationship between other types of trauma and delinquency. Further, the present study will build on the Salzinger and colleagues’ investigation by differentiating between maternal and paternal attachment, whereby it is proposed that, for boys, security in attachment to fathers may act as a buffer of the relationship between trauma and juvenile delinquency.

**Hypotheses**

In summary, the purpose of the present study was to fill a gap in the existing literature by examining the interrelationships among trauma, dyadic attachments to father and mother, alienation, and juvenile delinquency. Youth in detention centers have significantly higher rates of PTSD than their normative peers, and given the high percentage of males who fill the halls of juvenile detention facilities, it is important to examine the mechanisms by which trauma and delinquency are related for boys. Research suggests that the father may play a critical role in boys’ development, and thus it was hypothesized that insecurity of attachment to father would moderate the relationship between PTSD symptomatology and delinquency over and above the effect of insecurity of attachment to mother.

Stemming from this hypothesis, it is also necessary to consider the means by which attachment to father may influence delinquency, as surely not all youth who are insecure in their attachment to father become delinquent. Based on the theory that boys who experience a lack of security in their relationships with their fathers will be more likely to have increased levels of alienation, which in turn may be associated with increased delinquency, it was hypothesized that alienation would mediate the relationship between insecurity of attachment to father and delinquency. Taken together, the models hypothesized in the current study—one of moderation and the other of mediation—will contribute to the literature on the sequelae of trauma and the mechanisms to delinquency. Specifically, the present study was guided by the following three hypotheses:

1. There will be a positive relationship between level of PTSD symptomatology and degree of delinquent behavior;
2. Attachment to father will moderate the relationship between posttraumatic symptomatology and juvenile delinquency, whereby higher levels of insecurity in attachment to father will exacerbate the relationship between posttraumatic stress and delinquency;

3. Alienation, defined as distrust and estrangement from others, will mediate the relationship between insecurity in attachment to father and delinquency among boys in a juvenile detention center.

Method

Participants

Participants included 89 male adolescents who were remanded to the custody of a local juvenile detention center (JDC) at the time of participation in the study. The youth detained in the 54-bed detention facility have committed a variety of offenses, which include status offenses, misdemeanors, and felonies. The breakdown by offense within the facility consists of 63% who were technical violators referred from the Juvenile Court (violators of probation or previous court orders), 23% who were felony offenders, 11% who were misdemeanor offenders, and 2% who were status offenders. In 2008, the average length of stay in the JDC was 15 days (Butler County Juvenile Justice Center, 2009). While the facility remands both males and females, the population is disproportionately male, and only males were included in this study as informed by the research hypotheses.

Youth ranged in age from 12 years, 8 months to 18 years, 4 months, with a mean age of 16 years, 2 months ($SD = 1$ year, 5 months). Among the 89 participants, 63 (70.8%) were Caucasian, 21 (23.6%) African American, 1 (1.1%) Latino, and 4 (4.5%) multiracial. Of participants who answered the item related to religion ($N = 85$), 68 (80.0%) indicated that they were Christian, 3 (3.5%) were Atheist, 3 (3.5%) indicated that they did not affiliate with any particular belief system, 8 (9.4%) indicated that they did not know what they believed, and 3 (3.5%) indicated Other as their religion or belief system (e.g., Rastafarian).

Procedure

Prior to commencing research, this study and all procedures were approved by both the Butler County Juvenile Justice Center (BCJJC) and the Miami University Human Subjects Institutional Review Board (IRB). Data collection for this study occurred between August 2009 and May 2010. At parent visitation times to the BCJJC, parents and legal guardians of eligible
youth were provided with an opportunity to provide signed informed consent for their youth to participate in the research project while detained in the detention center. After parents provided informed consent, youth were given the opportunity to provide signed assent. No incentives were offered as a part of this research study to either parents or youth. Of 125 parents approached, 98 (78%) provided informed consent, although 2 youth were released from the detention prior to being provided with an opportunity to provide assent and participate in the study. Of the 96 boys approached, 90 (94%) provided assent. The data of one youth were unusable due to a computer error, resulting in a final sample of 89 participants.

For youth who provided assent, all measures were completed in a private interview room within the detention center, and to reduce fatigue or discomfort, measures were completed in either one or two settings (a total of approximately 60 to 90 minutes), depending on the preference of the participant. Participants completed all measures on a secure, password-protected laptop computer, using survey software that did not require use of the Internet (Snap Survey Offline Interviewing, Version 9). All interviews and surveys were administered by trained personnel with experience in both clinical and research practices. Also, personnel at the detention center provided researchers with the arrest histories for participating youth, although this data was unavailable for two youth.

Measures

PTSD symptomatology. The University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index for DSM-IV—Adolescent Version (PTSD-RI; Pynoos, Rodriguez, Steinberg, & Stuber, 1998; Steinberg, Brymer, Decker, & Pynoos, 2004) is a well-validated screening measure used to assess exposure to traumatic events and symptoms of PTSD. In Part I, the PTSD-RI screens for exposure to both noninterpersonal and interpersonal traumas, and the present study also added several items of betrayal and nonbetrayal trauma (Goldberg & Freyd, 2006) for a total of 24 potentially traumatic experiences. After considering all traumatic exposure, the youth chooses the event that is most distressing at the time of administration. In Part II, the identified event is used to assess for the subjective and objective criteria for A1 and A2 of the criteria for PTSD from the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text revision; DSM-IV-TR; American Psychiatric Association [APA], 2000). In Part III, PTSD symptomatology in the month prior to the interview is assessed on a Likert scale (0 = none of the time to 4 = most of the time), whereby the endorsement of a 3 or 4 is considered
affirmative for the presence of the PTSD symptom (Steinberg et al., 2004). Criteria for the likelihood of both Partial and Full PTSD can be scored based on DSM-IV criteria. Full PTSD indicates that a DSM-defined trauma was experienced and all three of the symptom clusters (Criterion B: Reexperiencing; Criterion D: Avoidance; and Criterion D: Hyperarousal) reached the necessary symptom threshold; Partial PTSD indicates that a trauma was experienced and two of the three symptom clusters reached the diagnostic threshold. Although not intended to be diagnostic, the PTSD-RI allows for preliminary symptomatic information and also provides a continuous scale of posttraumatic symptomatology that is of use in both research and clinical settings (Steinberg et al., 2004). The PTSD-RI has demonstrated good convergent validity in the agreement of cutoff scores with a PTSD diagnosis, high internal consistency (alphas in the range of .90 in various studies), and high test-retest reliability over a period of 7 days (Steinberg et al., 2004). Parent, child, and adolescent forms of the PTSD-RI are available, but only the adolescent form was administered in the present study. This measure was administered in an individual interview format by a trained clinician, allowing for the interviewer to answer questions and monitor youths’ level of distress. Similar to other studies, the PTSD-RI demonstrated good internal consistency in the present study, and Cronbach’s alphas were: .83 (Reexperiencing), .77 (Avoidance), .75 (Hyperarousal), and .89 (Total PTSD Score).

Attachment. The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) was developed as a self-report instrument to assess the internalized representations of parental and peer attachment throughout adolescence. The IPPA consists of separate self-report scales for parent and peer relationships, although a revised IPPA was utilized in the present study that differentiated between attachment to father (IPPA-F) and attachment to mother (IPPA-M; Armsden & Greenberg, 2007). The attachment to peer scale was not utilized in this study. Participants were first asked to identify the person they considered to be their father or father figure (and mother or mother figure), and they were then instructed to respond to the items of the IPPA-F (and IPPA-M) in reference to the person they identified as their father figure (and mother figure). Youth were also asked how frequently they had contact with their father (and mother) prior to detainment in the detention center. The parent scale consists of three subscales: Trust (10 items), Communication (9 items), and Alienation (6 items). The IPPA utilizes a five-point Likert scale (almost never or never to almost always or always), and, as recommended by Armsden and Greenberg (1989), a global score was obtained for each participant by taking the
sum of all items after all necessary reverse-scoring is completed.

The IPPA has demonstrated both reliability and validity (Armsden & Greenberg, 1987) and high test-retest reliability \( r = .93 \) has been reported over a three-week period (Armsden & Greenberg, 1989). The IPPA-F and IPPA-M have demonstrated good internal consistency in previous research, with reported Cronbach alphas of .88 and .89, respectively (Papini, Roggman, & Anderson, 1991). In the present study, Cronbach alphas were .79 for the IPPA-F and .97 for the IPPA-M.

**Alienation.** The *Jesness Inventory* was developed to assess for psychopathology and antisocial behavior in male adolescents and has been normed on both nondelinquent and delinquent samples. Recently revised (JI-R; Jesness, 2003), the JI-R consists of 11 personality scales (e.g., alienation, immaturity, social maladjustment) and 9 subtype scales (e.g., pragmatist/manipulator). The Alienation Scale “refers to the presence of distrust and estrangement in relationships with others, especially with authority figures” (Jesness, 2003, p. 17) and nondelinquent males score substantially lower than delinquent males on the 25 items to which the youth responds “yes” or “no” to each item. The internal reliability of the Alienation Scale of the JI-R is satisfactory (delinquent male youth sample alpha = .76), moderate test-retest reliability with a delinquent sample over an 8-month period has been demonstrated \( (r = .49) \), and construct validity has been established (Jesness, 2003). In the present study, Cronbach’s alpha for the JI-R Alienation Scale was .93.

The JI-R Alienation Scale was constructed to examine alienation and estrangement from society and relationships with others such as police officers or other figures. As described above, one of the subscales of the IPPA examines alienation in the parent-child relationship, and it is theorized that this is conceptually distinct from a broader, social alienation. However, the intercorrelations of the IPPA subscales and the JI-R Alienation Scale were examined. Although the JI-R Alienation Scale was significantly associated with the Alienation subscale of both the IPPA-F \( (r = .30, p = .006) \) and IPPA-M \( (r = .22, p = .047) \), the IPPA Alienation subscale was less strongly correlated with the JI-R Alienation Scale than either the Communication subscale of the IPPA-F \( (r = -.46, p < .001) \) and IPPA-M \( (r = -.35, p = .002) \) or the Trust subscale of the IPPA-F \( (r = -.51, p < .001) \) and IPPA-M \( (r = -.30, p = .007) \). The modest correlation between the Alienation subscale of the IPPA and the Alienation Scale of the JI-R indicates that these two scales do tap into distinct aspects of alienation as anticipated. Additionally, no regression results
changed when the alienation subscale was removed from the IPPA, and therefore, all results presented use the IPPA score consisting of all three subscales.

**Delinquency.** Similar to previous research (Capaldi & Stoolmiller, 1999; Lattimore, MacDonald, Piquero, Linster, & Visher, 2004; Smith, Leve, & Chamberlain, 2006; Visher, Lattimore, & Linster, 1991; Wood, Foy, Layne et al., 2002), official records were used to measure delinquency. However, as has been done in previous research using self-reports of delinquency (Elliott & Ageton, 1980; Muñoz & Frick, 2007), both the frequency of delinquency as well as the range of severity in delinquency were utilized and incorporated into the delinquency scores established for each youth participant. Possible charges were grouped into different categories based on their severity (e.g., status offenses, non-violent miscellaneous offenses, non-violent criminal offenses, violent criminal offenses, and sexual offenses). A scoring system was established that combines the level of offense and the number of offenses to create a total score of delinquency. Offense levels have been assigned a rank-order score, ranging from a status offense (weight of 1) to a sexual offense (weight of 5). For example, a youth who has a record of two status offenses (each with a weight of 1) and one violent criminal offense (with a weight of 4) would have a total delinquency score of 6. A youth with two sexual offenses (each with a weight of 5) and 2 non-violent criminal offenses (each with a weight of 3) would have a total delinquency score 16.

The use of official records for measuring delinquency provides the advantageous possibility of examining actual police and court records as a testament to the youth’s delinquent behavior. Although a youth will obviously have a record only for those crimes for which they were charged (and, presumably, caught), the use of official records avoids some of the difficulties present when using self-report methods and incorporates only those behaviors associated with actual involvement in the juvenile justice system. In the present study, four delinquency variables were created: lifetime arrests, lifetime delinquency severity, past year arrests, and past year delinquency severity.

**Statistical Approaches to Testing Mediation**

Mediation analysis has been an instrumental approach to examining causality and interrelationships among variables across many disciplines and frameworks, including developmental psychopathology. Various approaches to testing for mediation have been proposed and utilized, the most popular of which has been the approach outlined in a seminal
article by Baron and Kenny (1986). Also, procedures to examine the confidence limits of the mediated effect have been advocated for as this allows for an examination of the size of the effect rather than a solely binary decision of statistical significance (Harlow, Mulaik, & Steiger, 1997; Sobel, 1982). More recently, however, various methodologists have advocated for a different approach to testing for mediation, including an examination of confidence intervals of the mediated effect, and particularly, bootstrapping methods (Hayes, 2009; MacKinnon, 2008; MacKinnon & Fairchild, 2009; Preacher & Hayes, 2008a, 2008b). Briefly, the Baron and Kenny (1986) approach, the confidence interval of the indirect effect approach (using methods outlined by MacKinnon, 2008), and the bootstrapping approach (Preacher & Hayes, 2004, 2008a) each will be described and all three approaches will be used to test for the hypothesized mediation in the Results section.

Baron and Kenny (1986) Causal Steps Approach. Baron and Kenny, in their 1986 article (see also Hyman, 1955; Judd & Kenny, 1981) outlined what is often called the causal steps strategy for assessing mediation. According to this approach (see Baron & Kenny, 1986, p. 1176), a variable is considered to be a mediator if it meets three requirements. First, there must be a significant correlation between the independent variable and the presumed mediator (see a on the bottom model of Figure 1). Second, there must be a significant correlation between the presumed mediator and the dependent variable (see b on the bottom model of Figure 1). Third, a previously significant relationship between the independent variable and the dependent variable (see c on the top model of Figure 1) must be no longer significant after controlling for the presumed mediator (see c’ on the bottom model of Figure 1). For hypotheses using meditational models, it is rare that the significance is reduced to zero after controlling for the mediator variable, but it is the degree to which the effect is reduced that serves as an indicator of the strength and potency of the mediator (Baron & Kenny, 1986; Holmbeck, 1997).

Despite widespread use, the Baron and Kenny (1986) approach has been criticized for several limitations (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004, 2008a, 2008b). Specifically, both Type I and, particularly among large samples, Type II errors may be more likely than in other methods (Holmbeck, 1997; Preacher & Hayes, 2008b), and there may be low statistical power (MacKinnon et al., 2002). Also, the indirect causal path is not directly tested and the size of the indirect effect is not estimated despite being central to the concept of mediation (Preacher & Hayes, 2008b).
Confidence Intervals for the Indirect Effect Approach. Because the causal steps approach does not estimate the size of the indirect effect, no confidence interval for the population indirect effect can be constructed (Preacher & Hayes, 2008b). However, a confidence interval for the mediated effect can be constructed by using an estimate of the mediated effect in conjunction with the standard error, whereby the mediated effect is considered to be statistically significant if the confidence interval does not contain zero (MacKinnon, 2008; Sobel, 1982). To construct a confidence interval of the indirect effect, either product of coefficient standard errors (standard errors based on $ab$) or difference in coefficients standard errors (standard errors based on $c - c'\) can be used (see Figure 1), particularly given that $ab = c - c'$ when the sample size is the same across all regression analyses (MacKinnon, 2008). In order to test for mediation using the confidence interval for the indirect effect approach, separate regression analyses are conducted to derive the statistical significance among the variables, unstandardized regression estimates, and standard errors. The estimate of the mediated effect is then calculated by either $ab$ or $c - c'$ given their equivalence when no missing data is present, although if there is missing data, it is recommended that $ab$ be used (D. P. MacKinnon, personal communication, July 7, 2010). Then, both the standard error of the mediated effect and confidence limits for the mediated effect can be calculated (see Figure 2).

Bootstrapping. Bootstrapping increasingly is considered the preferred method for testing indirect effects, and its use has been advocated given that it does not rely on the normal distribution assumptions that are often violated in other statistical practices, has greater statistical power while maintaining reasonable control over the Type I error rate, and can more confidently be used with small samples (Efron, 1987; Hayes, 2009; MacKinnon et al., 2004; Preacher & Hayes, 2004, 2008a, 2008b; Shrout & Bolger, 2002). Bootstrapping is a nonparametric resampling procedure that uses the sample data to generate an empirical representation of the sampling distribution of the indirect effect. In order to generate this distribution, the original sample size is considered a representation of the true population, and it is repeatedly sampled with replacement as a way to mirror the original sampling process.

The sampling with replacement process is conducted by building a sample of new cases from the original sample while allowing each case to be returned to the sample with the possibility of being redrawn while the sample is constructed. This process is performed a specified number of times (usually at least 1,000, although at least 5,000 is recommended), and
for each of these resamples, $a$ and $b$, as well as $ab$, is calculated (see Figure 1). The distribution of the $ab$ estimates are considered an empirical approximation of the sampling distribution of the indirect effect, and the $ab$ estimates are ordered from lowest to highest and then used to form a confidence interval at a predetermined level (e.g., 95%). This confidence interval forms the percentile-based bootstrap, although the endpoints can be adjusted to yield a bias corrected or a bias-corrected and accelerated confidence interval (Efron, 1987; MacKinnon et al., 2004).

Results

Data Cleaning Procedures

The Presence of Father and Mother Figures. The statistical software IBM SPSS Statistics (Statistical Package for the Social Sciences), Version 18, was used for all data entry, cleaning, and analyses. Both the IPPA-F and IPPA-M were examined for the presence of an identified father and mother figure present in the youth’s life. Each youth was asked to respond to items on the IPPA-F and IPPA-M with regard to their feelings about their father (mother), “or a person who has acted as your father (mother).” Participants were also asked to identify who the father and mother figure was that they were thinking of when responding to the IPPA-F and IPPA-M, respectively.

Among the youth, 67% of boys responded to the IPPA-F in relation to their biological father, and another 17% responded in relation to a stepfather. Seven percent responded in relation to another male relative (e.g., grandfather, uncle) and 1 youth responded in relation to an adoptive father. Four youth (4.5%) responded that there was no one they considered to be their father or father figure in their lives, and thus it was unclear how these youth conceptualized their responses on the IPPA-F. Additionally, two youth responded to the option of “Other” as a father figure, and they wrote that their stepmother or mother took on the role of both father and mother. Given the research hypotheses that differentiate between attachments to fathers and mothers, these two youths’ responses, as well as the responses of the four youth who stated that they did not have any father or father figure, were eliminated from all further analyses.

In regard to mothers, no participants responded that they did not have a mother or mother figure. Specifically, 91% of participants responded to the IPPA-M in relation to their biological mother, 3% in relation to an adoptive mother, and 6% in relation to another female relative (e.g., grandmother, aunt). Thus, no participants’ responses on the IPPA-M led to any further subject removal, leaving a final sample of 83 boys from which all further data analyses are based. An
independent samples $t$-test indicated that there were no differences on any hypothesis variables between those boys who indicated their biological father (mother) as their father (mother) figure and those that indicated someone else as their father (mother) figure.

**Missing Data Procedures.** All self-report variables (IPPA-M, IPPA-F, and JI-R Alienation Scale) were computed by summing each item from each respective scale as described in the Method section. Each variable was then examined for missing data, and missing data were replaced for those subjects who left less than one-third of a scale’s items blank. Specifically, 12 participants left one or two items missing from the IPPA-F Trust Scale, 2 participants left one item missing from the IPPA-F Communication Scale, 4 participants left one or two items missing from the IPPA-F Alienation Scale, 3 participants left one item missing from the IPPA-M Trust Scale, 4 participants left one item missing from the IPPA-M Communication Scale, 3 participants left one or two items missing from the IPPA-M Alienation Scale, and 5 participants left one item missing on the JI-R Alienation Scale. To account for missing values in summing each variable across participants on the IPPA-F and IPPA-M, the average of the remaining items for each subscale (i.e., Communication, Trust, Alienation) was used to replace each respective missing value before summing each subscale, and the sums of each subscale were then totaled to calculate the total IPPA-F and total IPPA-M. To account for missing values on the JI-R Alienation Scale, the average of the remaining items was used to replace the respective missing value before summing the scale.

**Tests for Normality.** The normality of each variable was first evaluated by examining histograms, outliers, and stem-and-leaf plots. All self-report and interview data were within the possible range for each measure, and the number of arrests and delinquency severity variables had substantial variability. Next, skewness and kurtosis were examined by the Kolmogorov-Smirnov-Lilliefors (K-S Lilliefors) test for normality. The K-S Lilliefors test indicated that the lifetime arrests, past year arrests, and past year delinquency severity variables were significantly different from a normal distribution. Given this, these variables were transformed using logarithm transformation as outlined by Miles and Shevlin (2000). After running these transformations, the lifetime arrests variable more closely resembled a normal distribution and the skewness and kurtosis statistics were within an acceptable range. However, the distribution of the past year arrests and past year delinquency severity variables were still significantly different from a normal distribution after conducting both logarithm and square root
transformations. Since the past year arrests and past year delinquency severity variables did not meet the assumption of a normal distribution required for regression analyses, these two variables were only used in bootstrapping analyses given that bootstrapping does not assume a normal distribution. These two variables were used in examining whether PTSD was associated with delinquency, although results from those regression analyses must be interpreted with some caution. Also, because of the potentially problematic skew and kurtosis for the lifetime arrests variable, all analyses were performed twice, once with the untransformed data and once with the transformed data. No results, including correlations or regression models, differed when the transformed variables were used, and so only results with the original untransformed data are reported.

**Descriptive Statistics**

The study variables’ means, standard deviations, minimum and maximum values, and degree of skew and kurtosis are presented in Table 1. The descriptive statistics indicate that the boys in this study have been arrested an average of 6.8 times throughout their lives and an average of 3 times in the past year, indicating that many of the boys in the sample have been engaged regularly with the juvenile justice system throughout late childhood and adolescence. Additionally, in this sample the average T-score on the alienation scale of the JI-R was 53.9, and the average raw score was 11.2, which is notably higher than the average raw school of 8.4 among the norming sample of 15-year-old male delinquents (Jesness, 2003). Thus, youths’ responses on the Alienation Scale of the JI-R indicate that the present sample evidenced high levels of alienation. Of the 81 boys for whom JI-R data was complete, 7 (8.6%) had responses on the JI-R alienation scale that were at or above a T-score of 70.

Intercorrelations among study variables are presented in Table 2. As expected, both attachment to father and attachment to mother were negatively correlated with alienation ($r = -.49, p < .001$ and $r = -.34, p = .002$, respectively), whereas alienation was positively correlated with trauma exposure ($r = .36, p = .001$) and Total PTSD ($r = .27, p = .03$). Also, the Total PTSD score was significantly associated with both lifetime ($r = .26, p = .03$) and past year ($r = .29, p = .02$) arrests, as well as past year delinquency severity ($r = .26, p = .03$). Contrary to expectations, neither attachment to father nor attachment to mother was correlated with either PTSD score or with any of the delinquency measures at the $\alpha = .05$ level of significance.
Attachment to father was negatively correlated with PTSD score \( (r = -0.21, p = 0.09) \) at the trend level of significance.

**Prevalence of Trauma and PTSD.** As displayed in Table 3, the significant majority of the boys responded that they had experienced at least one adverse life event on the PTSD-RI, and on average they had experienced approximately six adverse life experiences (see Table 1). Table 3 also displays the percentage of subjects who experienced specific adverse life experiences on the PTSD-RI. Specifically, the majority of participants reported witnessing community violence as well as personally experiencing community violence. Relatedly, over one-fourth reported having seen a dead body, and approximately half of participants reported hearing of the violent death or injury of a loved one. It is also evident that the youth in this sample had been exposed to high levels of violence in their homes, with more youth reported being a witness to domestic violence than experiencing domestic violence directly. Only one youth reported having experienced sexual abuse. It is also evident that many of the participants experienced noninterpersonal traumas. For instance, approximately one-quarter of the boys reported experiencing a fire, flood, or other natural disaster, and one-quarter reported that they had experienced a painful or scary medical treatment in a hospital when they were very sick or injured. Approximately one-third of the sample reported experiencing an accident, such as a serious car accident.

Whereas 95\% of the sample reported having experienced at least one adverse life experience, approximately 4 out of every 5 boys in the sample experienced a trauma as defined by the *DSM* (Criterion A for PTSD), which requires both an objective component whereby there was a threat to the physical self as well as a subjective experience of terror, fear, or helplessness (APA, 2000). Youth who met Criterion A for PTSD completed the remainder of the PTSD-RI that assesses posttraumatic symptomatology for three separate clusters: reexperiencing, avoidance, and hyperarousal. Of the 83 boys in the sample, eight met criteria for likely Partial PTSD and eight met criteria for likely Full PTSD, indicating that approximately 20\% of the sample likely met criteria for either Partial or Full PTSD.

**Attachment to Father and Mother.** The boys in the present sample indicated that their relationships with their mothers are significantly more positive than their relationships with their fathers \( (t = -4.00, df = 76, p < .001) \). However, the means of both the IPPA-M and IPPA-F (Table 1) indicate that, on average, the participants in this study reported high degrees of trust
and communication in their relationships with their parents (or parent figures). Compared with youth who responded to the IPPA-F in reference to their biological father, youth who chose a nonbiological father figure did not differ on their reports of attachment to either father ($t = .23, df = 78, p = .82$) or mother ($t = -.76, df = 78, p = .45$). Also, young adolescents (age 12-15) did not provide significantly different reports than older adolescents (age 16-18) regarding their degree of attachment to either father ($t = .45, df = 78, p = .65$) or mother ($t = .75, df = 78, p = .46$).

**Hypothesis 1: Main Effect of PTSD on Delinquent Behavior**

To test the hypothesis that there would be a positive relationship between level of PTSD symptomatology and degree of delinquent behavior, four separate regression analyses were conducted. These analyses tested whether PTSD symptoms were associated with *lifetime arrests, lifetime delinquency severity, past year arrests*, and *past year delinquency severity*. The results of the latter two analyses should be interpreted with some caution given that these variables did not meet the assumption of normality. Although not used in the moderational or mediational analyses, these past year delinquency variables were used in the main effect analyses in order to corroborate the findings related to lifetime delinquency.

In the four regression models, age and ethnicity were entered first in the models as covariates, and results are presented in Table 4. Overall, the hypothesis that PTSD symptoms would predict delinquency was supported, as the predictive relationship was significant in three of the regression models and approached significance in the fourth model. Subsequent analyses were conducted to examine whether PTSD predicted delinquency above and beyond levels of trauma exposure. Although not shown, results indicated that for the past year delinquency variables, the number of traumas reported by the youth did not predict delinquency, whereas PTSD did predict delinquency after controlling for trauma exposure, age, and ethnicity ($F$-change $= 4.02 [1, 62], p = .05$ for past year delinquency severity and $F$-change $= 4.84 [1, 62], p = .03$ for past year arrests). Conversely, when entered simultaneously into the regression model, neither traumatic exposure nor PTSD symptoms predicted lifetime delinquency severity or lifetime arrests. Therefore, results indicate that the hypothesis that posttraumatic stress symptoms would be associated with delinquency was largely supported, and this effect was still present for the past year delinquency variables even after controlling for the total number of traumas reported.
Hypothesis 2: Attachment to Father as a Moderator of the Relationship Between PTSD Symptoms and Delinquency

To test the hypothesis that attachment to father moderates the relationship between posttraumatic symptomatology and delinquency, above and beyond attachment to mother, a series of hierarchical regression analyses were conducted for the lifetime delinquency variables (lifetime delinquency severity and lifetime arrests) following the recommendations of Aiken and West (1991). Attachment to father, attachment to mother, and PTSD score were each centered prior to creating interaction terms and conducting the regression analyses.

Three individual hierarchical regressions were conducted, one for each delinquency variable, with age, ethnicity, and attachment to mother entered as covariates on the first step, and attachment to father and PTSD score entered on the second step. The two-way father attachment × PTSD score interaction term was entered on the third step. Results indicate that neither a model consisting of both independent variables nor the model including the attachment to father × PTSD score interaction term were significant predictors of delinquency. As shown in Table 5, results indicate that attachment to father did not moderate the relationship between posttraumatic symptoms and delinquency for either lifetime delinquency variable: lifetime delinquency severity and lifetime arrests. Although not displayed, separate models were tested to examine whether attachment to mother, as opposed to attachment to father, moderated the relationship between PTSD symptoms and delinquency after controlling for attachment to father, and none of the interaction terms were significant for either lifetime delinquency variable.

The results of multiple regressions examining the relationship between PTSD symptoms and delinquency are displayed in Table 5. After controlling for age, ethnicity, and attachment to both father and mother, PTSD symptoms significantly contributed to the prediction of delinquency. Specifically, PTSD was a significant predictor of lifetime arrests, in addition to approaching significance as a predictor of lifetime delinquency. An examination of the beta weights for the lifetime arrests regression revealed that, as expected, age was positively related to the number of arrests accrued by a youth across the life history.

Hypothesis 3: Alienation as a Mediator of the Relationship Between Attachment to Father and Delinquency

Baron and Kenny (1986) Causal Steps Approach. As described above, the Baron and Kenny (1986) causal steps approach to mediation requires several steps to be established in order
to test the hypothesis that alienation would mediate the relationship between attachment to father and delinquency. The lifetime arrests variable was examined first as the measure of delinquency. Age, ethnicity, relationship with father (biological father or not), and father contact (how frequently youth had contact with their father figure prior to incarceration) were entered as covariates for all regression models. As shown in the top portion of Table 6, the first step indicates that attachment to father (the independent variable) is not a significant predictor of lifetime arrests (the dependent variable). Since this first step is not significant, no further steps would be conducted according to the Baron and Kenny (1986) approach; however, the remaining steps were conducted and reported here in order to demonstrate the standard procedures used in the causal steps approach to mediation. The next step requires that attachment to father (the independent variable) is a significant predictor of alienation (the potential mediator), and this step is satisfied in the present sample. In the third regression model, mediation is established when the mediator is a significant predictor of the dependent variable when the independent variable is controlled for. Again, there was no initial relationship between the independent variable and the dependent variable, and so this third step is not necessary in this case within the causal steps approach to mediation. Nonetheless, as the final model results in Table 6 show, the third requirement is not met in the present sample and demonstrates that alienation does not predict lifetime arrests after controlling for attachment to father.

The same approach was used to examine whether alienation mediates the relationship between attachment to father and lifetime delinquency severity (in contrast to lifetime arrests). Again, the first condition of the causal steps approach is not satisfied given that attachment to father does not significantly predict lifetime delinquency severity, and so it is evident that alienation does not mediate the relation between attachment to father and lifetime delinquency severity (see Table 7).

Confidence Intervals for the Mediated Effect Approach. According to some methodologists, the first requisite of the Baron and Kenny (1986) method where the independent variable must significantly predict the dependent variable, may not always be necessary (Collins, Graham, & Flaherty, 1998; Hayes, 2009; Shrout & Bolger, 2002), particularly if multiple mediating paths carry the effect from the independent variable to the dependent variable and the indirect effects have opposite signs that cancel each other out (MacKinnon, 2008; MacKinnon, Krull, & Lockwood, 2000). By using a confidence intervals for the mediated effect approach,
the confidence interval is examined to see whether or not it contains zero, in which an interval that does not contain zero demonstrates that the mediated effect is significant.

After an estimate of the mediated effect \((ab = c - c')\) is calculated from three separate regression models like those used in the Baron and Kenny (1986) approach, the standard error of the mediated effect \((s_{ab})\) and the confidence limits (upper = UCL; lower = LCL) for the mediated effect can be calculated (MacKinnon, 2008; see Figure 2 for formulas). As recommended by MacKinnon (personal communication, July 7, 2010), analyses are performed so that all subjects are in each analyses so that it can be verified that \(ab\) does indeed equal \(c - c'\), which leaves a sample of 64 participants with complete data that were used in these analyses. When testing by this approach whether alienation mediated attachment to father and lifetime arrests, the estimate of the mediated effect \(ab = (-0.177)(-0.065) = 0.012\), which is equivalent to \(c - c' = -0.007 - -0.019 = 0.012\). Using the equations from Figure 2, the \(s_{ab}\) is -0.0092 and the UCL and LCL for the mediated effect \((\alpha = .05)\) are -0.006 and 0.030, respectively (note that the upper confidence limit is actual below the lower confidence limit due to the standard error of the mediated effect being negative). Given that the confidence limits contain zero, it can be determined that alienation does not mediate attachment to father and lifetime arrests, which is the same conclusion reached when using the causal steps approach. Likewise, similar to the causal steps approach, the confidence intervals for the mediated effect approach also finds that alienation does not mediate attachment to father and lifetime delinquency severity \((ab = 0.047; s_{ab} = 0.0425; LCL – UCL = -0.0362, 0.1302)\). Thus, both the causal steps approach and the confidence intervals for the mediated effect approach indicated that alienation did not mediate the relationship between attachment to father and lifetime arrests or lifetime delinquency severity.

**Bootstrapping.** Following recommendations by Preacher and Hayes (2004, 2008a, 2008b) as outlined above, bootstrapping also was used as the optimal approach to assessing statistical mediation (see also Shrout & Bolger, 2002). Bootstrapping does not require the assumption of a normal distribution, and so delinquency was examined as measured by all four official arrest variables: lifetime arrests, lifetime delinquency severity, past year arrests, and past year delinquency severity. A bias corrected bootstrap, as recommended by MacKinnon and colleagues (2004), was conducted (20,000 resamples). In the present study, the bootstrap procedure was conducted using the SPSS macro by Preacher and Hayes (2008a). Using this
procedure, an indirect effect (point estimate of \(ab\)) is considered significant if the 95% bias-corrected confidence interval does not contain zero. As displayed in Table 8, each of the confidence intervals encompass zero when alienation is entered as a mediator of attachment to father and delinquency. Thus, all approaches to testing mediation—causal steps, confidence intervals for the mediated effect, and bootstrapping—demonstrated that, in the present sample, alienation did not mediate attachment to father and delinquency.

**Post-hoc Analyses**

Post-hoc analyses were conducted in order to further examine the role of differential parental attachments in understanding the interrelations among trauma exposure, alienation, and PTSD symptoms. The *a priori* moderational hypothesis in the present study focused on the father-son attachment in understanding the link between posttraumatic symptomatology and delinquency given that differential attachments may influence the degree to which trauma and PTSD are associated with delinquency and other negative outcomes. In line with this thinking, the purpose of these post-hoc analyses was to examine whether delinquent boys’ attachments to father or mother were differential moderators of the relationships between traumatic exposure and two possible outcomes, namely, alienation and PTSD symptoms. At the correlational level, traumatic exposure was significantly associated with both alienation \((r = .36, p < .001)\) and PTSD symptoms \((r = .42, p < .001)\), and yet alienation and posttraumatic symptomatology may be distinct sequelae associated with exposure to trauma. Although there may be some overlap between alienation and PTSD symptoms (e.g., irritability), alienation is characterized by a greater degree of *outward visibility* (e.g., distrust of authority, estrangement from others), whereas PTSD symptoms are represented primarily by *internal distress* (e.g., numbing, distressing reexperiencing).

Likewise, research has demonstrated that secure attachment may buffer the effects trauma has on negative outcomes (e.g., Aspelmeier, Elliott, & Smith, 2007) and adult responses to childhood trauma and disclosures of abuse impact the severity of posttraumatic symptomatology and the child’s recovery process (see Lovett, 2004, for a review). However, the role of differential attachments to father or mother in influencing distinct trauma-related outcomes has not been tested. Research demonstrates that mothers, compared to fathers, are consistently rated as primary attachment figures (Rosenthal & Kobak, 2010) and are more frequently sought during stressful situations (Paterson, Field, & Pryor, 1994). On the other hand, fathers may be
particularly influential in sons’ responses to trauma given sons’ tendency to look to their fathers for guidance (Hoeve et al., 2009; Lamb & Lewis, 2004). However, the specific role fathers may play in response to trauma disclosure among children has been notably understudied (Lovett, 2004). Taken together, although it was anticipated that attachment security would buffer the effects of trauma on both alienation and PTSD symptoms, specific hypotheses were not made regarding the differential role of father or mother attachment in these post-hoc analyses. Indeed, the possibility that differential attachments to father and mother would both moderate the effects of trauma exposure was anticipated, given previous research demonstrating the role of the mother in attachment-related behaviors (e.g., proximity-seeking, secure base behaviors) in conjunction with research emphasizing children’s tendency to more closely identify with their same-sex parent (e.g., Hoeve et al., 2009; Laible & Carlo, 2004). Thus, in order to examine directly whether differential attachments to father and/or mother would uniquely buffer or exacerbate the link between trauma exposure and outcomes of alienation or PTSD symptoms, two models were examined. The first model examined whether attachment to father or attachment to mother moderated the relationship between trauma exposure and alienation. The second model examined whether attachment to father or attachment to mother moderated the relationship between trauma exposure and PTSD.

**Attachment to Father as a Moderator of the Relationship Between Trauma Exposure and Alienation.** In order to test for moderation, a series of hierarchical regression analyses were conducted following the recommendations of Aiken and West (1991). Trauma exposure, attachment to father, and attachment to mother were each centered, and then interaction terms (trauma exposure × father attachment and trauma exposure × mother attachment) were created prior to conducting the regression analyses. Variables were entered in three different steps in order to test for moderation. First, age and ethnicity were entered as covariates on the Step 1. Trauma exposure, attachment to father, and attachment to mother were entered on Step 2. The two interaction terms (trauma exposure × father attachment and trauma exposure × mother attachment) were then entered on Step 3 simultaneously to examine whether a significant interaction would be present after controlling for any interaction effects related to attachment to the other parent (Jaccard & Turrisi, 2003).

As shown on the left side of Table 9, Steps 2 and 3 accounted for significantly more variance than the respective prior model. After controlling for covariates, the effect of trauma
exposure, attachment to father, and the trauma exposure × attachment to father significantly contributed to the regression equation in the final model ($F[7, 67] = 8.07, p < .001$).

Specifically, trauma exposure was a significant predictor of alienation, whereas attachment to father negatively predicted alienation, indicating that both higher levels of trauma exposure and lower levels of attachment to father were predictive of alienation. However, neither attachment to mother nor the trauma exposure × attachment to mother interaction were significant predictors of alienation. Therefore, the results are consistent with the thinking that differential attachments to father and mother would moderate the relationship between trauma exposure and alienation.

Next, a graph was created to represent the significant trauma exposure × father attachment interaction. Steps for plotting the interaction were conducted following the procedures outlined by Aiken and West (1991) and Cohen, Cohen, West, and Aiken (2002). Aiken and West (1991) note, “probing a significant interaction in [multiple regression] beings with recasting the regression equation as the regression of the criterion on one predictor” (p. 12). In other words, the basic interaction regression equation (see top panel of Figure 3) is restructured and simplified so that only one predictor variable (the independent variable, in this case traumatic exposure) remains after particular values of the moderator variable (in this case, attachment to father) are input into the regression equation. As recommended by Aiken and West (1991), the first step in plotting a significant moderational effect is to choose the different values of the moderator that are then used to generate simple regression equations. Specifically, Cohen and Cohen (1983; see also Aiken & West, 1991; Cohen et al., 2003) suggest that three different values of the moderator be chosen: the mean of the moderator ($M_M =$ mean moderator value), one standard deviation above the mean of the moderator ($M_H =$ high moderator value), and one standard deviation below the mean of the moderator ($M_L =$ low moderator value). Because the moderator was mean centered prior to its entry in the regression analyses, $M_M = 0$. For the attachment to father variable, the standard deviation (which is unaffected by mean centering) is 22.70; therefore, $M_H = 22.70$ and $M_L = -22.70$. Then, each of these three values was substituted into the regression equation as shown in the middle panel of Figure 3 to create three separate simple regression equations that were then used to graphically plot the interaction.

Figure 4 shows the interaction whereby attachment to father moderates the relationship between trauma exposure and alienation. The figure shows that at low levels of traumatic exposure, a high level of security of attachment to father ($M_H$, represented by the short-dashed
line) is associated with lower levels of alienation. However, as the number of traumatic exposures increases, high levels of attachment to father are associated increasingly with higher levels of alienation. Thus, it appears that for highly traumatized boys, self-reported security in attachment to father is associated with higher levels of alienation. Conversely, it appears that low levels of security in attachment to the father (M₁, represented by the long-dashed line) are associated with high rates of alienation across all levels of trauma exposure.

Next, the plotted high and low regression lines were examined to see whether the slopes of the simple regression lines in Figure 4 were significantly different from zero. Following the procedures outlined by Aiken and West (1991; see also Darlington, 1990), conditional values of the moderator variable were created first. To do this, three steps were carried out. First, a new variable was created that represented the original moderator (attachment to father) minus the conditional value of interest for that moderator (in this example, 22.70, which is +1SD above the attachment to father mean). Second, a new interaction term was created with the new conditional value variable and the independent variable (traumatic exposure). Third, the dependent variable (alienation) was regressed on the independent variable and both of the new variables (the conditional variable of the moderator and the interaction). These three steps were then repeated for the -1SD (-22.70) conditional value of interest. The resulting regression coefficient (b₁) in each regression model is the desired simple regression coefficient of the dependent variable on the independent variable at the conditional value of the moderator. After these steps were performed, simple slope analyses indicated that the slope for participants with high levels of attachment security to father was significant (t = 5.20, p < .001), whereas the slope for participants with low levels of attachment security to father was not significant (t = -0.40, p = .69). Therefore, when sons rated their father attachments as poor, the number of traumatic experiences had no effect on levels of alienation, as high levels of alienation were evidenced consistently among these youth regardless of the number of traumas experienced. However, high ratings of father-son attachment did affect the relationship between the amount of trauma exposure and alienation, such that high ratings of father attachment were associated with low levels of alienation in conjunction with low levels of trauma exposure, whereas higher levels of alienation were evidenced in conjunction with high levels of trauma exposure.

**Attachment to Mother as a Moderator of the Relationship Between Trauma and Posttraumatic Symptomatology.** Similar procedures to the preceding moderational analysis
were used to examine whether attachment to mother or attachment to father moderated the relationship between trauma exposure and posttraumatic symptomatology. Variables and interaction terms were entered in the same order as described in the preceding moderational analysis. The only change from the previous analysis was that posttraumatic symptomatology was used as the dependent variable in order to examine whether father or mother attachments differentially impact the degree to which trauma exposure was associated with PTSD symptoms.

As shown on the right side of Table 9, Steps 2 and 3 accounted for significantly more variance than the respective prior model. After controlling for covariates, the effect of trauma exposure and the trauma exposure × attachment to mother interaction significantly contributed to the regression equation in the final model ($F[7, 59] = 3.47, p = .004$). As anticipated, trauma exposure was a significant predictor of PTSD symptoms. Although neither attachment to father nor attachment to mother predicted PTSD symptoms, the trauma exposure × attachment to mother interaction (but not the trauma exposure × attachment to father interaction) significantly predicted PTSD symptoms. Therefore, the results demonstrated that differential attachments to father and mother moderated the relationship between trauma exposure and PTSD symptoms.

Again following the procedures outlined by Aiken and West (1991), the significant trauma exposure × mother attachment interaction was graphed. As described above, three interaction equations were used (see the lower panel in Figure 3) to represent the mean of attachment to mother (0 when centered), as well as one standard deviation above the mean (+19.23) and one standard deviation below the mean (-19.23). Next, these three regression lines were plotted to form the moderation graph shown in Figure 5. Although increases in the degree of trauma exposure were generally associated with increases in PTSD symptoms, this relationship between trauma exposure and PTSD symptoms differed as a function of attachment to mother. Next, an examination of the slopes for the high and low levels of attachment to mother indicated that the slopes of the high level of attachment to mother was significant ($t = 4.48, p < .001$), whereas the slope for the low level of attachment to mother was not significant ($t = 1.44, p = .15$). Therefore, the relationship between trauma exposure and PTSD symptoms was not impacted by attachment to mother when the mother-son attachment was rated as poor (see the long-dashed line in Figure 5). However, high security in attachment to mother (represented by the short-dashed line in Figure 5) was associated with lower levels of PTSD symptoms, but only among youth who had low levels of traumatic exposure. As the number of
traumas experienced increased, self-reported high attachment to mother was associated with increased PTSD symptoms in the present sample. Taken together, the results of these two post-hoc moderational analyses provide evidence that attachments to father and mother—and, particularly, high self-report ratings of father and mother attachments—differentially affect the degree to which trauma exposure is associated with alienation or PTSD symptoms.

**Discussion**

The present study examined the interrelationships of father and mother attachment, alienation, and PTSD symptoms among a sample of male juvenile delinquents. This research provides additional support to the finding by other investigators that a very high percentage of juvenile justice-involved youth have experienced trauma. In addition, a sizeable proportion of these youth experience posttraumatic symptoms and meet criteria for likely Full or Partial PTSD. This study also sought to extend the state of knowledge related to the role of fathers in buffering or exacerbating the effects of trauma among delinquent boys, as well as to examine the possibility that alienation may be one mechanism by which a son’s insecure attachment to father may be associated with juvenile offending. Although these two hypotheses were grounded in previous research, neither was supported in the current study. However, post-hoc analyses indicated that attachment to father moderated the relationship between trauma exposure and alienation, whereas attachment to mother moderated the relationship between trauma exposure and PTSD symptoms. First, the results of the present study will be discussed, followed by limitations and considerations for future research.

**Trauma and PTSD Among Detained Male Adolescents**

In the present study, 95% of participants reported the experience of an adverse life experience. To date, the study by Abram and colleagues (2004) is the largest and most comprehensive investigation of the prevalence of trauma and PTSD among detained youth, consisting of 532 males and 366 females. Overall, prevalence rates of adverse life experiences found in the present study and the study by Abram and colleagues were similar. One notable difference between the two studies is the average number of aversive events reported by participants. In the present study, the average number of adverse life experiences was almost 6, whereas the mean number of traumas experienced by boys in the Abram and colleagues study was 14.6. Measurement differences likely account for these discrepancies, given that the PTSD-RI used in the present study only assessed for whether the youth had ever experienced a
particular type of event (e.g., community violence, domestic violence), but did not assess for how many times the youth experienced an event within each category.

In addition, over 80% of the youth in this study met Criterion A for PTSD, indicating that the adverse life experience was accompanied by subjective feelings of terror, fear, or helplessness. Additionally, one in ten boys met criteria for likely Partial PTSD, and another one in ten met criteria for likely Full PTSD, indicating that almost one in five boys in the study were experiencing significantly distressing levels of posttraumatic symptomatology. This prevalence rate corroborates the research reviewed earlier indicating that PTSD symptoms are frequently present among juvenile justice-involved youth, and the rates of traumatic exposure and PTSD in the present study (95.2% and 9.6%, respectively) are very close to those found by Abram and colleagues (2004; 93.2% and 10.9% of boys, respectively). Although the majority of these youth did not go on to meet criteria for full or partial PTSD, it is clear that many youth in the present study experienced some distressing levels of posttraumatic symptoms. Recently, theorists in the field of traumatic stress have challenged the categorical approach to PTSD, particularly for children and adolescents (van der Kolk, 2005, 2009), given that posttraumatic stress reactions that do not rise to the level of a DSM-diagnosis may still interfere with functioning (Fletcher, 2003; Newman, 2002) or may not be captured by the current diagnostic system (van der Kolk et al., 2009). Relatedly, Smith and colleagues (2006) found that, among juvenile justice-involved girls, diagnostic measures of trauma did not predict adolescent offending, whereas measures of cumulative and composite trauma did, adding support to the need to move beyond classifications of full or partial PTSD when assessing detained youth.

The Relationship Between Posttraumatic Stress and Juvenile Delinquency

In addition to establishing that the youth in the present study had experienced high rates of trauma similar to other investigations with juvenile justice-involved youth, the present study found that PTSD symptoms in particular were associated with levels of delinquency. The results of the first hypothesis are noteworthy, particularly given that they provide substantiating evidence that posttraumatic symptoms are directly associated with delinquent behaviors (Smith et al., 2006). This finding contributes to the current literature in several ways. First, although high rates of trauma exposure and PTSD have been found among delinquent youth (see Kerig & Becker, in press, for a review), this study used official arrest records to demonstrate that there was a relationship between PTSD symptoms and both the severity of delinquency and the
number of arrests in a youth’s history. To date, surprisingly little research has examined whether PTSD and delinquency are directly associated. Second, this study utilized a sample of detained boys and thus corroborates the findings of Smith and colleagues (2006) from an all-girl sample. Specifically, Smith and colleagues (2006) found that, among 88 girls court-mandated to out-of-home treatment, posttraumatic stress symptoms were associated with the number of criminal referrals received in the past year. Third, the present research extends the literature by providing evidence that not only do detained boys have higher prevalence rates of PTSD than their non-detained peers as has been consistently reported, but that the degree of posttraumatic stress is also associated with the number of times a boy has been arrested as well as the severity of a boy’s cumulative legal charges, both in the past year and across the boy’s lifetime. It may be that the accumulation of arrests and charges is important in understanding the link between PTSD and delinquency. For instance, Wood and colleagues (Wood, Foy, Layne et al., 2002) did not find posttraumatic symptoms to be associated with the severity of the precipitating offense that led to the youth’s detainment, whereas the present study examined past year and lifetime arrest histories. Although the majority of adolescents are not involved in the juvenile justice system, some engagement in delinquent behaviors may be normative in adolescence (Moffitt, 1993). Therefore, a pattern of involvement with the juvenile justice system may be particularly important in understanding the relationship between PTSD and delinquency, and these results also highlight the importance of developing effective assessments and interventions that can be implemented upon a youth’s entry into the juvenile justice system.

Another primary purpose of the present research was to examine the interrelationships of dyadic child-parent attachments, alienation, and PTSD symptoms among these youth. Specifically, two hypotheses—one moderational and one mediational—were tested. First, a model was tested to examine whether attachment to father moderated the relationship between PTSD symptoms and delinquency above and beyond the effect of attachment to mother. This hypothesis was not supported by data in the present study. Across two moderational models using lifetime delinquency variables, the relationship between posttraumatic symptomatology and delinquency did not differ as a function of participants’ levels of security of attachment to father.

The third hypothesis examined whether alienation mediated the relationship between attachment to father and delinquency. Three different statistical approaches to testing mediation
were utilized, and results across all three approaches consistently demonstrated that the mediatational hypothesis was not supported by the present data. Given that neither attachment to father nor alienation were significantly correlated with any of the delinquency variables, this finding is not surprising, although it is possible (albeit rare; MacKinnon, 2008) that mediation may exist even if there is no direct relationship between the independent and dependent variables.

**Alienation.** The finding that alienation was not associated with delinquency was somewhat surprising, although the results replicate Kunce and Hemphill’s (1983) finding that the Jesness Alienation Scale was not significantly correlated with arrests among detained male adolescents. Nonetheless, in the present sample, approximately 9% of the sample had highly elevated alienation scores, and the average score among boys in the present sample (53.9) was only slightly lower than scores found among other samples, including psychiatrically hospitalized adolescents (57.3; Bradley, Karwacki, & Peterson, 1990) and delinquent youth (54.5; Kunce & Hemphill, 1983). Thus, these results indicate that the present sample evidenced relatively high rates of distrust and estrangement toward others, particularly authority figures. In addition, the average $T$-score on the Alienation Scale among youth in the current sample (53.9) was almost identical to the scores found in two large samples with juvenile offenders in California and Arizona, each of which reported $T$-score means of 53 (Jesness, 1983). It is possible that although the Jesness Inventory, and more specifically the Alienation Scale, has been found to distinguish between delinquent and nondelinquent youth in early research with the measure (see Martin, 1981, for a brief review), it lacks the necessary properties to differentiate correlates of alienation among youth who are already involved in the juvenile justice system. Indeed, Martin (1981) found that whereas a few scales of the Jesness Inventory, particularly the Asocial Index, were able to differentiate between youth evidencing different levels of delinquency, there were no significant differences among control, acting-out (community youth with minor behavior problems), noncharged delinquent (youth placed in an institutional setting but not judged delinquent through formal court proceedings), and delinquent youth on the Alienation Scale. Relatedly, an earlier edition of the Jesness Inventory manual (1983) reports that although 15-year-old incarcerated delinquents had higher $T$-scores on the majority of scales than minor offenders, minor offenders actually had higher $T$-scores than the incarcerated delinquents on several scales, including the Alienation Scale. Therefore, the lack of results
found with the Alienation Scale may reflect the fact that there was restriction of range among this incarcerated sample and/or that it is not sensitive to levels of alienation youth already in detention settings.

**Attachment.** Neither attachment to father nor attachment to mother was significantly correlated with any of the four delinquency variables measured in the current study. Consistent with much previous research, participants rated their relationships with their mothers as significantly more positive than their relationships with their fathers (Lamb & Lewis, 2004). However, on average, the youth in the present study rated their relationships with both parents as positive overall, and the delinquent males in the present sample did not provide substantially different ratings on the IPPA than have been reported by youth recruited from community samples (Mason, Cauce, Gonzales, & Hiraga, 1994; Simons, Paternite, & Shore, 2001). The measure of attachment and sampling procedures used in the present study might help understand this surprising finding.

**Measurement of attachment.** First, the IPPA measures youths’ perceptions of their relationships with their fathers and mothers, but does not ascertain how these perceptions were historically developed or maintained. It is possible that some boys indicated having a highly positive relationship with their father or mother as a self-protective mechanism because it is less threatening to hold on to beliefs of their father or mother as trustworthy, supportive, and caring rather than to acknowledge problems in the child-parent relationship (Breuk, Clauser, Stams, Slot, & Doreeleijers, 2007; Maier, Bernier, Pekrun, Zimmermann, & Grossmann, 2004; Sroufe et al., 2005). For these youth, it may be that an interview measure such as the AAI (George et al., 1996) would reveal the presence of an insecure attachment, even in the midst of high ratings on the face-valid IPPA. More specifically, the AAI focuses on both the content (i.e., actual responses) and the discourse (i.e., pauses, inconsistencies, incoherence, disorganization) so as to examine an individual’s current state of mind with respect to attachment (Hesse, 2008; Main, Kaplan, & Cassidy, 1985). An additional difference between the IPPA used here and the AAI is that the AAI emphasizes childhood experiences whereas the IPPA assesses respondents’ current relationships with an attachment figure. In the present sample, almost one-third of the boys chose a father figure who was not their biological father, and so AAI queries regarding experiences of loss or separation may be particularly relevant in examining attachment-related experiences. Likewise, the AAI queries for potential abuse and frightening or threatening
behaviors within the attachment relationship, whereas the measures in the current study did not directly assess for experiences of rejection, abuse, or maltreatment in the caregiver-child relationship.

In addition, recent research suggests that the IPPA, in contrast to the AAI, does not tap into automatic or unconscious processes associated with attachment relationships and may be prone to biases in samples of young adults (Maier et al., 2004). Specifically, Maier and colleagues found that “the IPPA might in part be subject to idealisation of the relationships with the parents” (p. 185) and that face-valid measures such as the IPPA might “be subject to social desirability confounds, and thus not correspond to the individuals’ ‘real’ representations of parental unavailability and supportiveness” (p. 186). Perhaps most interestingly, these authors found that as participants’ dismissing scores on the AAI increased, so did the likelihood that the unconscious representations of attachment were inconsistent with the conscious representations (Maier et al., 2004). Relatedly, Breuk and colleagues (2007) examined parent- and child-reported relationship quality in a sample of juvenile delinquents in a day treatment program. The authors found that although parents acknowledged the presence of problems in the parent-child relationship, the delinquent boys underestimated such problems. In fact, the delinquent youth did not differ from a community sample in their reports of the quality of the parent-child relationship even though poor family relations contributed to the boys’ referral to the day treatment program. Thus, the authors concluded, “questionnaire self-report is not a valid way of obtaining information regarding parent–child relationship problems in juvenile delinquents with psychiatric disorders, as children appear to deny problems with their parents” (p. 769). Taken together, the results of Maier and colleagues (2004) and Breuk and colleagues (2007) indicate that boys in the present study may have responded to the IPPA in an idealized or socially desirable manner, thus limiting the extent to which unconscious or undesirable aspects of the attachment system—the participants’ “‘real’ representations”—were captured.

In particular, adolescent idealization is relevant in understanding attachment security in adolescence. Adolescence, and the onset of formal operational thinking, is often associated with adolescents’ deidealization of their parents (Kerig & Wenar, 2006; Steinberg, 2007), and adolescents’ deidealization of mothers, particularly in conjunction with maternal supportiveness, has been linked to attachment security (Allen et al., 2003). Deidealization, however, consists not of a disregard for, or rejection of, attachment relationships, but rather the ability to
simultaneously balance autonomy and relatedness. In contrast, dismissing adolescents show the least autonomy and the least relatedness in parent-child interactions when compared with adolescents with any other attachment style (Becker-Stoll & Fremmer-Bombik, 1997, as cited in Allen, 2008). By a similar token, Sroufe and colleagues (2005) found that, among a sample of high-risk adolescents in a prospective longitudinal study, over 50% were classified as dismissing on the AAI, whereby participants “claimed perhaps no memory for childhood attachment experiences or derogated attachment experiences...or they may have idealized their parents, describing them in globally positive terms, but without being able to provide supporting examples” (p. 207, italics added; see also Weinfield, Whaley, & Egeland, 2004). As reviewed above, a dismissing attachment style in adolescence has been linked to delinquency and other externalizing behaviors, and dismissing adolescents, compared with preoccupied adolescents, more often come from families that are emotionally unresponsive (Reimer, Overton, Steidl, Rosenstein, & Horowitz, 1996). Notably, in considering the high-risk sample from which their results were drawn, Sroufe and colleagues (2005) emphasized the “temporary adaptation” associated with living at home amidst challenging familial or economic circumstances: “How can one face that it is a terrible situation and stay in it?” (p. 208). Rather, it may be somewhat adaptive to be dismissive of persistent negative circumstances in order to maintain some sense of stability or to make chronically stressful or traumatizing life situations more tolerable.

In fact, Sternberg and colleagues (2005) provide some evidence that self-reports of current attachment relationships as assessed by the IPPA may be influenced by the presence of abuse or maltreatment. Among Israeli adolescents, the investigators examined the impact of different forms of domestic violence (i.e., witnessed/experienced, in adolescence/in childhood) on adolescent-parent relationships and found that while recent violence exposure affected the adolescents’ attachments, early violence exposure did not. Also noteworthy from Sternberg and colleagues’ (2005) study is that whereas adolescent-mother attachment was negatively impacted by abuse regardless of whether or not the mother was the perpetrator, the adolescent-father attachment was not affected even when the father was the perpetrator (see also Herzberger, Potts, & Dillon, 1981). According to Freyd’s (1996) betrayal trauma theory, abuse or maltreatment within the context of a close relationship, such as that with a caregiver, may threaten the attachment system. Similar to the adaptive function described by Sroufe and colleagues (2005), Freyd notes that, “the child needs to trust his or her parents and caregivers” (Freyd, 1996, p. 3,
italics in original), and the result may be an insecure attachment characterized by both idealization and rage (Herman, 1997). Although not formally assessed in the present study, anecdotal responses among several youth in the present study indicate that it is possible that either idealization or other defense mechanisms may have influenced their responses on the IPPA. For example, when asked what he wanted to avoid in the next year on a measure that was not used in the present analyses, one youth responded, “Well, I don't want to be like my dad [was] when I was young and [do] what he did to my mom.” Despite this sentiment, however, this youth’s ratings of his father on the IPPA-F totaled 83, which is quite close to the mean score across all participants. Similarly, other youth acknowledged that they experienced terrifying or upsetting events in their homes and described incidents where their fathers were the perpetrators of violence, and yet these experiences did not appear to negatively influence their ratings on the IPPA-F. Youth with violent fathers often have conflicting perceptions of their father (Sternberg et al., 1994), and particularly, research is “suggestive of the conflicting feelings sons may have about their violent fathers” (Holden & Barker, 2004, p. 432). Certainly, these possible explanations for the surprising results on the IPPA are speculative, given that the present study did not assess for attachment typology (e.g., autonomous, dismissing), the extent to which a caregiver was the perpetrator of any abuse, the possibility that previously problematic attachment relationships had become more positive, or whether the father figure chosen by each youth on the IPPA-F was the man who had perpetrated any domestic violence described.

**Sampling.** A second explanation for the finding that attachment did not predict delinquency may be due to the sampling method used in the present study. Per the study procedures, parents were given the opportunity to provide informed consent upon their arrival at specific visitations times at the JDC. In addition to the 22% of parents who declined consent, the unfortunate reality is that many parents never come to visitations to visit their children while they are detained. It is plausible that the parents who both came to visitations and provided consent were those parents who had positive relationships with their children, whereas fewer youth with negative child-parent relationships were captured in the present sampling method. Alternatively, it is also possible that youth reflect upon changes they would like to make, or believe they need to make, once they leave the detention center. Some youth, particularly those youth whose parents come regularly to visitations, may respond to the IPPA in a way that reflects the supportive relationship they have experienced while incarcerated (as evidenced by
having parents who come to visitations) or the way in which they hope to experience the relationship upon release.

**Differential Father and Mother Attachments as Unique Moderators**

Post-hoc analyses revealed that attachment to father and mother differentially interact with trauma-relevant variables. Specifically, whereas attachment to *father* significantly moderated the relationship between trauma exposure and *alienation*, attachment to *mother* moderated the relationship between trauma exposure and *PTSD symptoms*. These moderational effects highlight the possibility that differential attachments may be uniquely associated with delinquent boys’ functioning or mental health outcomes, and the results also provide evidence that self-reports of high security in attachment do not always serve to buffer the impact of traumatic exposure on negative outcomes as might be anticipated.

The first moderational effect demonstrated that security in attachment to father, but not mother, buffered youth from the impact of traumatic exposure on alienation, but only for youth who experienced lower rates of traumatic exposure. For youth who experienced high rates of traumatic exposure, security of attachment to father was associated with higher rates of alienation. Conversely, the second moderational effect indicated that security in attachment to mother, but not father, buffered youth from the effect of traumatic exposure on PTSD symptoms, but again, this was only true for boys with lower levels of traumatic exposure. Similar to the results for moderational effect of attachment to father, security in attachment to mother was associated with higher rates of PTSD symptoms among boys who reported high rates of traumatic exposure. Although upon initial examination the moderation effects found are counterintuitive, they may be understood within the context of the measure of attachment used in the present study.

As discussed previously, it is possible that youths’ responses on the IPPA are prone to idealization or biases that do not accurately reflect the adolescent-parent relationship, and it is plausible that this is particularly true among the subset of youth who have experienced chronic and pervasive traumas. Although such an explanation must be considered with caution given that the present study did not assess for response biases or elevated responses on the IPPA, it may be that adolescents with histories of pervasive trauma are prone to answering items on the IPPA, a face-valid self-report measure of attachment, with exaggerated ratings of security. Although participants in the present study had similar responses on the IPPA to community
samples (Mason et al., 1994; Simons et al., 2001), differences in the way the IPPA is used and administered across studies (i.e., use of shortened version, particular subscales, or different scoring procedures) make it difficult to compare IPPA ratings in the present study to IPPA ratings in other samples of at-risk or detained youth. Nonetheless, as the findings of Sroufe and colleagues (2005) and Maier and colleagues (2004) would suggest, some youth may be prone to inflate the positivity of attachment in their relationships with their parents despite histories of rejection or anger in those relationships.

By the same token, youth who have experienced chronic trauma often experience alterations or disturbances in their attachment relationships. Herman (1992) noted that disturbances in attachment frequently are found among survivors of chronic abuse during childhood: “Oscillations in attachment, with formation of intense, unstable relationships, are frequently observed” (p. 385). In the current DSM, sequelae of trauma that are associated particularly with chronic or interpersonal traumas experienced during childhood are referred to as “associated features” of PTSD (APA, 2000). However, some investigators in the field of traumatic stress note that the current diagnostic system “does not adequately capture the symptoms of children who are victims of interpersonal violence in the context of inadequate caregiving systems” (van der Kolk et al., 2009, p. 2), and youth with chronic (or complex) trauma histories often have more complicated symptom composites than traumatized youth without histories of chronic trauma (Briere, Kaltman, & Green, 2008; van der Kolk, 2005). Among youth in the Illinois child welfare system, for example, Kisiel, Fehrenbach, Small, and Lyons (2009) found that youngsters with multiple or chronic caregiver trauma histories experienced significantly greater attachment-related problems as compared with youngsters who experienced single or noncaregiver traumas. Youth with multiple or chronic trauma histories related to caregiver abuse also were those most likely to demonstrate delinquent behavior (Kisiel et al., 2009).

However, the possibility that youth with high levels of trauma exposure may bias their responses on the IPPA in an overly positive direction does not explain the unique moderational findings that were specific to attachment to father or attachment to mother. Attachment to father moderated the relationship between trauma exposure and alienation, and parenting and gender role differences may partially account for this finding. A son’s relationship with his father may be more important in domains related to authority and trust, as fathers have been historically
been viewed as authority figures within the family context (see Pleck, 2004). Relatedly, chronic trauma is associated with a lack of trust in others (Nader, 2008; Streeck-Fischer & van der Kolk, 2000; van der Kolk, 2005), and youths’ ratings of their attachment to father, particularly in the midst of high levels of trauma exposure, may be uniquely associated with higher levels of alienation and distrust of authority figures.

On the other hand, adolescents generally report being closer to their mothers than to their fathers (Hosley & Montemayor, 1997) and, compared with fathers, mothers are more often sought in proximity-seeking situations (Paterson et al., 1994) and more frequently identified as primary attachment figures (Rosenthal & Kobak, 2010). The lack of support and comfort in the midst of perpetual victimization and trauma may exacerbate the risk for the subsequent development of PTSD symptoms. Possibly, for youth who have experienced high levels of trauma in the absence of maternal support, high self-report ratings on the IPPA indicate the desire for support and comfort rather than an accurate perception of the child-mother relationship. This idealization, as described above (Maier et al., 2004; Sroufe et al., 2005), may contribute to the lack of correspondence between a youth’s actual experience and a youth’s desire of an experience, even in the midst of distressing concurrent posttraumatic symptoms.

Again, this possibility must be considered speculative and be examined directly in future research before definitive conclusions can be reached. Perhaps most importantly, these findings indicate complex processes associated with traumatic exposure and differential parental attachments among juvenile delinquents, and this is an area where more research is needed.

Limitations

In addition to the sampling and measurement considerations already mentioned, several other limitations to the present study must be acknowledged. First, the data presented in this research were cross-sectional, and so no causal relationships among the variables can be presumed. Certainly, transactional and bidirectional processes may be at work among the study variables. For example, child-caregiver attachment is neither static nor deterministic, but rather interacts with complex environmental and contextual factors (Kobak et al., 2006) and allows for change to occur at various times across development (Sroufe, 1997). There may be discontinuity in attachment patterns, particularly among youth who encounter adverse life experiences such as divorce or trauma (Aikins et al., 2009; Allen et al., 2004; Hamilton, 2000). Likewise, individual factors (e.g., maternal depression), familial factors (e.g., marital discord), and contextual factors
(e.g., poverty) may influence the degree of warmth and degree of positivity in child-caregiver interactions, which may in turn contribute to patterns of relating (Davies & Cummings, 1994; de Wolff & van IJzendoorn, 1997). In the present study, although it was found that PTSD was associated with delinquency, the temporal relationship was not assessed. Although PTSD may be a catalyst toward delinquent for some youth (Kerig & Becker, 2010), it is also possible that antisocial youngsters place themselves in risky situations where they are likely to be victimized and experience subsequent posttraumatic stress (Becker & Kerig, in press).

In addition to the cross-sectional methodology utilized in this study, the majority of data were youth self-report, and although well-validated measures were used, self-report bias cannot be ruled out, particularly in light of the considerations discussed above regarding the measurement of attachment. However, further research using the IPPA with at-risk and institutionalized samples is needed, given that the IPPA has been widely used and shown to be useful in studying parent-adolescent relationships and a host of mental health problems and risk factors. Ideally, researchers will consider using the IPPA and a measure such as the AAI simultaneously. Also, just as it may be possible that youth overreport positivity within the parent-child relationship, it is possible that boys in detention are likely to underreport mental health symptoms (Vermeiren, 2003; Wasserman, Ko, & McReynolds, 2004) or experiences such as sexual abuse (Romano & De Luca, 2001; Wood, Foy, Goguen, Pynoos, & James, 2002). In regard to the possibility that youth may underreport posttraumatic stress symptoms specifically, Nader (2008) notes, “children may minimize their symptoms, thinking that other children are no longer symptomatic, or that they should not be symptomatic after months have passed” (p. 269). Likewise, although official records were used as a measure of delinquency represented by the extent to which a youth has received various legal charges, it was not possible to examine whether youth were ultimately found responsible for the charges. Thus, some youth may have been incarcerated even though their charges were ultimately dismissed, and although many youth reported that the experience of being arrested and incarcerated was in and of itself distressing or even traumatic, it is possible that for these youth particularly, experiences in the juvenile justice system contributed to higher levels of overall stress and anxiety. Additionally, the only charges and arrests included in the present study were those incurred within the county of the juvenile detention center, and so any charges received in a different jurisdiction were not included. The sample also consisted predominantly of White, Christian males, and future research would
benefit from greater diversity. Given that the sample consisted of only males, as well only those boys who were actually detained in the detention center, results cannot be assumed to generalize to delinquent girls or fully represent all boys within the juvenile justice system.

**Future Directions**

The results indicate that further research is needed to investigate the interrelationships among attachment, PTSD, alienation, and delinquency. Future research would benefit from multiple informants, wider sampling, as well as the use of different measures to capture each construct (e.g., official arrest records and self-report of delinquency, attachment interview and self-report of attachment). Certainly, prospective longitudinal research will be needed before any causal claims can be made definitively, and future researchers may want to explore not only the way in which trauma is a catalyst for antisocial behavior, but also explore the protective factors which contribute to the certainty that not all traumatized youth go on to engage in delinquent behaviors. In this vein of multifinality and equifinality, it will also be important for investigators to utilize a variety of samples, including community and detained samples. The use of longitudinal research will also allow for an examination of shifts in the self-reports of attachment, and whether attachments shift when a youth is incarcerated. Also, an important area for future research is in the area of the assessment of attachment in adolescence, particularly among high risk or vulnerable populations, and an investigation of the possibility that some youth respond with biases or idealizations on self-report measures of attachment warrants attention.

**Conclusion**

The results of this study highlight the need for further research among juvenile justice-involved youth. A growing body of literature speaks to the complexity and diversity of mental health needs found within detention centers and holding facilities, and the rate of trauma exposure and PTSD among incarcerated youth is alarming. Specifically, 95% of the youth in the present study acknowledged exposure to at least one adverse life experience, and the majority reported experiencing frequent, repeated exposure. Also, PTSD symptoms were directly associated with boys’ degree of delinquency. The long-term effect of abuse and violence can be harrowing, as illustrated by a story one youth shared. After describing seeing his stepfather hit his mom when he was young, he paused, and then said: “You know what I’m talking about? When you just have a picture in your head—when you have a photographed [*sic*] memory?”
Another youth described an incident during which he walked into a room where his cousin had hung herself. Even though this event had occurred over four years prior to the interview, the youth responded, “I remember that just like it was yesterday.” The stories of these youth, told to a researcher in a glass-enclosed interview room, need to be recognized and understood and, ultimately, contribute to increased attention to the mental health needs—including those related to trauma and PTSD—of juvenile offenders.
References


Herman, J. L. (1997). *Trauma and recovery: The aftermath of violence—from domestic abuse to political terror*. New York: Basic Books.


Table 1

**Descriptive Statistics for Study Measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPPA-F (SR)</td>
<td>80</td>
<td>88.05</td>
<td>22.70</td>
<td>39</td>
<td>127</td>
<td>-.36</td>
<td>-.61</td>
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<tr>
<td>IPPA-M (SR)</td>
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<td>99.81</td>
<td>19.23</td>
<td>52</td>
<td>130</td>
<td>-.49</td>
<td>-.48</td>
</tr>
<tr>
<td>Jesness (SR)</td>
<td>81</td>
<td>53.90</td>
<td>10.14</td>
<td>33</td>
<td>78</td>
<td>.13</td>
<td>-.56</td>
</tr>
<tr>
<td>Total Trauma Exposure (I)</td>
<td>83</td>
<td>5.88</td>
<td>3.69</td>
<td>0</td>
<td>14</td>
<td>.20</td>
<td>-.92</td>
</tr>
<tr>
<td>PTSD-RI (I)</td>
<td>68</td>
<td>22.04</td>
<td>11.56</td>
<td>2</td>
<td>43</td>
<td>.24</td>
<td>-1.20</td>
</tr>
<tr>
<td>Lifetime Arrests (OR)</td>
<td>81</td>
<td>6.84</td>
<td>5.03</td>
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<td>19</td>
<td>.73</td>
<td>-.48</td>
</tr>
<tr>
<td>Lifetime Delinquency Severity (OR)</td>
<td>81</td>
<td>21.68</td>
<td>14.92</td>
<td>2</td>
<td>68</td>
<td>.90</td>
<td>.19</td>
</tr>
<tr>
<td>Past Year Arrests (OR)</td>
<td>81</td>
<td>3.09</td>
<td>2.69</td>
<td>0</td>
<td>14</td>
<td>1.87</td>
<td>3.67</td>
</tr>
<tr>
<td>Past Year Delinquency Severity (OR)</td>
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<td>10.73</td>
<td>8.55</td>
<td>0</td>
<td>40</td>
<td>1.58</td>
<td>2.69</td>
</tr>
</tbody>
</table>

*Note.* The Jesness Alienation Scale utilizes a T-score converted from the raw data. Although data was collected while youth were detained, Past Year Arrests and Past Year Delinquency Severity variables have a minimum score of 0 due to four participants being held for violations of probation or parole, which were not included in the delinquency variables. Min = Minimum; Max = Maximum; IPPA-F = Inventory of Parent and Peer Attachment-Father; IPPA-M = Inventory of Parent and Peer Attachment-Mother; Jesness = Jesness Inventory-Revised; PTSD-RI = Posttraumatic Stress Disorder-Reaction Index. I = Interview; SR = Self-report; OR = Official records. N = Number of participants; M = Mean; SD = Standard Deviation.
Table 2

*Intercorrelation Matrix*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IPPA-Father</td>
<td></td>
<td>.28*</td>
<td>-.49***</td>
<td>-.13</td>
<td>-.10</td>
<td>-.23†</td>
<td>-.20</td>
<td>-.21†</td>
<td>-.07</td>
<td>.03</td>
<td>.10</td>
<td>.22†</td>
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<tr>
<td>2. IPPA-Mother</td>
<td></td>
<td></td>
<td>-.34**</td>
<td>-.22†</td>
<td>-.01</td>
<td>-.18</td>
<td>-.22†</td>
<td>-.16</td>
<td>.00</td>
<td>.09</td>
<td>-.04</td>
<td>.05</td>
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<td>3. Jesness Alienation Scale</td>
<td></td>
<td></td>
<td></td>
<td>.36***</td>
<td>.15</td>
<td>.21†</td>
<td>.34**</td>
<td>.27*</td>
<td>-.01</td>
<td>-.14</td>
<td>-.03</td>
<td>-.03</td>
</tr>
<tr>
<td>4. Total Trauma Exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.29*</td>
<td>.30*</td>
<td>.49***</td>
<td>.42***</td>
<td>.15</td>
<td>.13</td>
<td>.11</td>
<td>.14</td>
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<tr>
<td>5. Reexperiencing (Crit. B)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.66***</td>
<td>.53***</td>
<td>.85***</td>
<td>.23†</td>
<td>.20†</td>
<td>.30*</td>
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<td>6. Avoidance (Crit. C)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.60***</td>
<td>.90***</td>
<td>.22†</td>
<td>.13</td>
<td>.17</td>
</tr>
<tr>
<td>7. Arousal (Crit. D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.82***</td>
<td>.22†</td>
<td>.17</td>
<td>.30*</td>
<td>.29*</td>
</tr>
<tr>
<td>8. PTSD-RI Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.26*</td>
<td>.20</td>
<td>.29*</td>
<td>.26*</td>
</tr>
<tr>
<td>9. Lifetime Arrests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.88***</td>
<td>.59***</td>
<td>.37***</td>
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<tr>
<td>10. Lifetime Delinquency Severity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.51***</td>
<td>.50***</td>
</tr>
<tr>
<td>11. Past Year Arrests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>.80***</td>
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<td>12. Past Year Delinquency Severity</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All correlations with the Lifetime Arrests variable are with untransformed data, although the significance level did not differ for any variable when the transformed variable was used. The Jesness Alienation Scale utilizes a $T$-score converted from the raw data.

PTSD-RI = Posttraumatic Stress Disorder-Reaction Index; IPPA = Inventory of Parent and Peer Attachment.

† ≤ .10. *p ≤ .05. **p ≤ .01. ***p ≤ .001.
Table 3

Boys’ Reports on the UCLA Posttraumatic Stress Disorder Reaction Index

<table>
<thead>
<tr>
<th>Youth Reporting Specific Traumatic Events Experienced</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire or Natural Disaster</td>
<td>20</td>
<td>24%</td>
</tr>
<tr>
<td>Accident</td>
<td>29</td>
<td>35%</td>
</tr>
<tr>
<td>War (including “street war”)</td>
<td>9</td>
<td>11%</td>
</tr>
<tr>
<td>Experienced domestic violence</td>
<td>16</td>
<td>19%</td>
</tr>
<tr>
<td>Witnessed domestic violence</td>
<td>25</td>
<td>30%</td>
</tr>
<tr>
<td>Experienced community violence</td>
<td>60</td>
<td>72%</td>
</tr>
<tr>
<td>Witnessed community violence</td>
<td>66</td>
<td>80%</td>
</tr>
<tr>
<td>Saw a dead body</td>
<td>23</td>
<td>28%</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Death/injury of a loved one</td>
<td>41</td>
<td>49%</td>
</tr>
<tr>
<td>Medical trauma</td>
<td>20</td>
<td>24%</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>18%</td>
</tr>
</tbody>
</table>

Youth Meeting DSM-IV Criteria for Trauma and PTSD

| Endorsement of Any Exposure to Adverse Life Events    | 79  | 95.2% |
| Experience of a DSM-defined Trauma (Criterion A1 and A2) | 68  | 81.9% |
| Full PTSD                                            | 8   | 9.6%  |
| Partial PTSD                                         | 8   | 9.6%  |
| Total (Full or Partial PTSD)                         | 16  | 19.3% |

Note. Total N = 83. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders; PTSD = Posttraumatic Stress Disorder.
Table 4

*Multiple Regression Models Testing for Posttraumatic Stress Symptoms as a Predictor of Past Year and Lifetime Delinquency*

<table>
<thead>
<tr>
<th>Lifetime Delinquency Severity</th>
<th>Lifetime Arrests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 Model Summary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>.17</td>
<td>1.45</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
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<tr>
<td>-.18</td>
<td>-1.58</td>
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<tr>
<td>Step 2 Model Summary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSD symptoms</td>
<td></td>
</tr>
<tr>
<td>.20</td>
<td>1.71*</td>
</tr>
<tr>
<td>R²</td>
<td>.06</td>
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<tr>
<td>ΔR²</td>
<td>.06</td>
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<tr>
<td>ΔF</td>
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<tr>
<td>β</td>
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<tr>
<td>t</td>
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<tr>
<td>R²</td>
<td>.11</td>
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<tr>
<td>ΔR²</td>
<td>.11</td>
</tr>
<tr>
<td>ΔF</td>
<td>3.86*</td>
</tr>
<tr>
<td>β</td>
<td>.14</td>
</tr>
<tr>
<td>t</td>
<td>2.76**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Past Year Delinquency Severity</th>
<th>Past Year Arrests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 Model Summary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>.15</td>
<td>1.33</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>-.25</td>
<td>-2.15*</td>
</tr>
<tr>
<td>Step 2 Model Summary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSD symptoms</td>
<td></td>
</tr>
<tr>
<td>.28</td>
<td>2.38*</td>
</tr>
<tr>
<td>R²</td>
<td>.08</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.08</td>
</tr>
<tr>
<td>ΔF</td>
<td>2.90*</td>
</tr>
<tr>
<td>β</td>
<td>.16</td>
</tr>
<tr>
<td>t</td>
<td>5.14</td>
</tr>
<tr>
<td>R²</td>
<td>.14</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.14</td>
</tr>
<tr>
<td>ΔF</td>
<td>5.55*</td>
</tr>
<tr>
<td>β</td>
<td>.23</td>
</tr>
<tr>
<td>t</td>
<td>3.03**</td>
</tr>
</tbody>
</table>

Note. Beta weights reflect variables’ coefficients in final model. PTSD = Posttraumatic Stress Disorder.

† < .10. *p<.05. **p<.01.
Table 5

Summary of Regression Analyses Testing for Attachment to Father as a Moderator of the Relationship Between Posttraumatic Stress Symptoms and Lifetime Delinquency

<table>
<thead>
<tr>
<th></th>
<th>Lifetime Delinquency Severity</th>
<th></th>
<th>Lifetime Arrests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( R^2 ) ( \Delta R^2 ) ( \Delta F ) ( \beta ) ( t )</td>
<td></td>
<td>( R^2 ) ( \Delta R^2 ) ( \Delta F ) ( \beta ) ( t )</td>
</tr>
<tr>
<td><strong>Step 1 Model Summary</strong></td>
<td>.08 ( .08 ) ( 1.67 )</td>
<td></td>
<td>.10 ( .10 ) ( 2.34^\dagger )</td>
</tr>
<tr>
<td>Age</td>
<td>( .18 ) ( 1.45 )</td>
<td></td>
<td>.30 ( 2.57^* )</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>( -.17 ) ( -1.36 )</td>
<td></td>
<td>-.09 ( -.77 )</td>
</tr>
<tr>
<td>Attachment to mother</td>
<td>( .14 ) ( 1.04 )</td>
<td></td>
<td>.08 ( .62 )</td>
</tr>
<tr>
<td><strong>Step 2 Model Summary</strong></td>
<td>.13 ( .06 ) ( 1.88 )</td>
<td>.18 ( .08 ) ( 2.99^\dagger )</td>
<td></td>
</tr>
<tr>
<td>Attachment to father</td>
<td>( .05 ) ( .42 )</td>
<td></td>
<td>-.03 ( -.27 )</td>
</tr>
<tr>
<td>PTSD symptoms</td>
<td>( .24 ) ( 1.92^\dagger )</td>
<td></td>
<td>.28 ( 2.33^* )</td>
</tr>
<tr>
<td><strong>Step 3 Model Summary</strong></td>
<td>.13 ( .00 ) ( .00 )</td>
<td>.19 ( .00 ) ( .10 )</td>
<td>.04 ( .32 )</td>
</tr>
<tr>
<td>Attachment to father × PTSD symptoms</td>
<td>( .01 ) ( .06 )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Attachment and posttraumatic symptomatology variables are centered before they are entered into the regression equation. Beta weights reflect variables’ coefficients in final model. PTSD = Posttraumatic stress disorder. \( ^\dagger p < .10 \). \( ^* p < .05 \). \( ^{**} p < .01 \). \( ^{***} p < .001 \).
Table 6

**Hierarchical Linear Regression Model Testing for the Mediating Effect of Alienation on the Relation Between Attachment to Father and Lifetime Arrests**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifetime Arrests:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment to Father</td>
<td>.08</td>
<td>1.274</td>
<td>-.07</td>
</tr>
<tr>
<td>Alienation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment to Father</td>
<td>.29</td>
<td>5.873***</td>
<td>-.458***</td>
</tr>
</tbody>
</table>

**Final Regression Model**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.29*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father Figure</td>
<td>-.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father Contact</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to Father</td>
<td>-.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alienation</td>
<td>-.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* $^a$ = The preliminary criterion/predictor results are presented after controlling for the variables entered in Step 1 of the final regression model. Total $N = 83$.  
* $p<.05$. *** $p<.001$.  

Table 7

Hierarchical Linear Regression Model Testing for the Mediating Effect of Alienation on the Relation Between Attachment to Father and Lifetime Delinquency Severity

<table>
<thead>
<tr>
<th>Criterion: Lifetime Delinquency Severity</th>
<th>$R^2$</th>
<th>F</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to Father</td>
<td>.04</td>
<td>.630</td>
<td>.641</td>
</tr>
<tr>
<td>Alienation</td>
<td>.29</td>
<td>5.873***</td>
<td>- .458***</td>
</tr>
<tr>
<td>Final Regression Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td>.05</td>
<td>.866</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>.168</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td>-.112</td>
</tr>
<tr>
<td>Father Figure</td>
<td></td>
<td></td>
<td>-.024</td>
</tr>
<tr>
<td>Father Contact</td>
<td></td>
<td></td>
<td>-.058</td>
</tr>
<tr>
<td>Step 2</td>
<td>.08</td>
<td>1.001</td>
<td></td>
</tr>
<tr>
<td>Attachment to Father</td>
<td></td>
<td></td>
<td>.066</td>
</tr>
<tr>
<td>Alienation</td>
<td></td>
<td></td>
<td>-.158</td>
</tr>
</tbody>
</table>

Note. $^a$ = The preliminary criterion/predictor results are presented after controlling for the variables entered in Step 1 of the final regression model. Total $N = 83$. ***$p < .001$. 
Table 8

Summary of Bootstrapping Results Testing for the Mediation of the Effect of Alienation on Attachment to Father on Variables of Delinquency

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Mediation Effect (SE)</th>
<th>95% Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Past Year Arrests</td>
<td>-.0003 (.0076)</td>
<td>-0.0172</td>
</tr>
<tr>
<td>Past Year Severity</td>
<td>-.0010 (.0256)</td>
<td>-0.0757</td>
</tr>
<tr>
<td>Lifetime Arrests</td>
<td>.0008 (.0144)</td>
<td>-0.0177</td>
</tr>
<tr>
<td>Lifetime Severity</td>
<td>.0033 (.0466)</td>
<td>-0.0295</td>
</tr>
</tbody>
</table>

Note. All bootstrap analyses conducted while controlling for age, ethnicity, father figure (biological or not biological father), and father contact. Mediation effect is bias-corrected. SE = Standard Error; CI = Bias-corrected and accelerated 95% confidence interval. N = 77.
Table 9
*Summary of Regression Analyses Testing for Attachment as a Moderator of the Relationship Between Trauma Exposure and Alienation or PTSD*

<table>
<thead>
<tr>
<th></th>
<th>Alienation</th>
<th></th>
<th>PTSD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>$\Delta R^2$</td>
<td>$\Delta F$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>Step 1 Model Summary</td>
<td>.05</td>
<td>.05</td>
<td>1.95</td>
<td>.03</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td>.06</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2 Model Summary</td>
<td>.39</td>
<td>.34</td>
<td>12.81***</td>
<td>.33</td>
</tr>
<tr>
<td>Trauma exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment to father</td>
<td></td>
<td></td>
<td></td>
<td>-.37</td>
</tr>
<tr>
<td>Attachment to mother</td>
<td></td>
<td></td>
<td></td>
<td>-.13</td>
</tr>
<tr>
<td>Step 3 Model Summary</td>
<td>.46</td>
<td>.07</td>
<td>4.12*</td>
<td>.25</td>
</tr>
<tr>
<td>Trauma exposure ×</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment to father</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma exposure ×</td>
<td></td>
<td></td>
<td></td>
<td>.05</td>
</tr>
<tr>
<td>Attachment to mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Attachment and traumatic exposure variables are centered before they are entered into the regression equation. Beta weights reflect variables’ coefficients in final model. PTSD = Posttraumatic stress disorder. † < .10. *p<.05. ***p<.001.
Figure 1. Path Diagram for the Regression Model (Top Model) and Mediation Model (Bottom Model).
Standard error of the mediated effect:

\[ s_{ab} = \frac{ab}{\sqrt{t_a^2 + t_b^2}} \], where \( ab = \) product of coefficient standard errors, \( t_a = t \) value of the \( a \) effect, \( t_b = t \) value of the \( b \) effect

95% confidence limits for the mediated effect:

Lower confidence limit (LCL) = mediated effect – \( z_{Type\text{error}} (s_{ab}) \)

Upper confidence limit (UCL) = mediated effect + \( z_{Type\text{error}} (s_{ab}) \)

*Figure 2.* Equations for the Standard Error of the Mediated Effect and the 95% Confidence Limits for the Mediated Effect. Adapted from MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis.* New York: Lawrence Erlbaum.
Basic interaction equation:

\[ \hat{Y} = b_0 + b_1X + b_2M + b_3XM \]

where \( \hat{Y} \) = the expected value of the criterion, \( X \) = the independent variable, \( M \) = the moderating variable, and \( XM \) = the interaction of the independent variable and the moderating variable.

Simple regression equations for attachment to father as a moderator of the relationship between traumatic exposure and alienation:

At \( M_{H} = 22.70 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 54.35 + .77X + -.22(22.70) + .04X(22.70) \\
= 49.36 + 1.68X
\]

At \( M_{M} = 0 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 54.35 + .77X + -.22(0) + .04X(0) \\
= 54.35 + .77X
\]

At \( M_{L} = -22.70 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 54.35 + .77X + -.22(-22.70) + .04X(-22.70) \\
= 59.34 + -.14X
\]

Simple regression equations for attachment to mother as a moderator of the relationship between traumatic exposure and PTSD symptoms:

At \( M_{H} = 19.23 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 21.51 + 1.48X + -.08(19.23) + .04X(19.23) \\
= 19.97 + 2.25X
\]

At \( M_{M} = 0 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 21.51 + 1.48X + -.08(0) + .04X(0) \\
= 21.51 + 1.48X
\]

At \( M_{L} = -19.23 \):
\[
\hat{Y} = b_0 + b_1X + b_2M + b_3XM \\
= 21.51 + 1.48X + -.08(-19.23) + .04X(-19.23) \\
= 23.05 + .71X
\]

Figure 3. Simple Regression Equations for Plotting Moderational Interactions. Note: For simplicity in displaying the interactions, the basic interaction model is represented in the simple regression equations, rather than the full model used to test for interaction as displayed in Table 8. However, the graphical representations show a similar pattern of interaction, and so the simple regression equations are used in the graphical displays. PTSD = Posttraumatic Stress Disorder. Equations and procedures adapted from Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analyses for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum.
Figure 4. Two-way interaction describing the moderating effect of attachment to father on the relationship between trauma exposure and alienation.
Figure 5. Two-way interaction describing the moderating effect of attachment to mother on the relationship between trauma exposure and posttraumatic symptomatology. PTSD = Posttraumatic stress disorder.