Predictors of depressive symptomatology, substance use, and delinquency among sexually maltreated youth: the roles of socioenvironmental risk, social support, and peer rejection

Melissa Ramrattan

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PREDICTORS OF DEPRESSIVE SYMPTOMATOLOGY, SUBSTANCE USE, AND DELINQUENCY AMONG SEXUALLY MALTREATED YOUTH: THE ROLES OF SOCIOENVIRONMENTAL RISK, SOCIAL SUPPORT, AND PEER REJECTION

by

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Abstract

Drawing upon multiple waves of data from the National Survey of Child and Adolescent Well-Being (NSCAW), the present study sought to examine the longitudinal relations among socioenvironmental risk, social support, peer rejection, and various mental health outcomes (e.g., depressive symptoms, substance use, and involvement in delinquent acts) in a sample of 269 sexually maltreated youth between the ages of 10 and 14 at Wave 1. Research has demonstrated relationships among child sexual abuse, internalizing symptoms, and externalizing symptoms. However, much of what is known about the association between child sexual abuse and psychopathology has come from studies in which child sexual abuse is characterized as the primary determinant of subsequent difficulties. It was hypothesized that socioenvironmental risk at Wave 1 will influence depressive symptomatology, substance use, and involvement in delinquent acts at Wave 4 indirectly through peer rejection at Wave 3 and that the magnitude of the indirect effects are dependent upon social support at Wave 1. Overall, the hypothesized models were unsupported for the outcomes examined in the present study, depressive symptoms, substance use, and involvement in delinquent acts. However, specific paths were supported in the present study. Notably, socioenvironmental risk at Wave 1 was significantly associated with depressive symptoms and substance use at Wave 4, and peer rejection at Wave 3 was associated with depressive symptoms and involvement in delinquent acts at Wave 4. In addition, peer rejection at Wave 3 fully mediated the relation between socioenvironmental risk at Wave 1 and depressive symptoms at Wave 4 among females; however, this effect was no longer observed after accounting for initial levels of depressive symptoms. The findings of the present study have implications for
future research and the development of interventions aimed at providing assistance and support to sexually maltreated youth and their families.
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Chapter I: Introduction

Child sexual abuse constitutes a significant public health problem in the United States. According to the National Child Abuse and Neglect Data System, of an estimated 772,000 children that were determined to be victims of child maltreatment in 2008, approximately 9.1 percent were sexually maltreated (U.S. Department of Health and Human Services, 2010). This is alarming because there is mounting evidence that child sexual abuse is associated with a range of negative outcomes that span the areas of physical, behavioral, and psychological well-being (Bolger & Patterson, 2001; Cicchetti & Toth, 2005; Koss, Bailey, Yuan, Herrera, & Lichter, 2003; Maikovich-Fong & Jaffee, 2010) lasting into adulthood (Walsh, Fortier, & DiLillo, 2010). Child sexual abuse may have profound social and personal consequences, including lower levels of educational attainment (Duncan, 2000), increased risk of early pregnancy (Logan, Holcombe, Ryan, Manlove, & Moore, 2007; Putnam, 2003), and decreased quality of life (Paolucci, Genuis, & Violato, 2001). In addition to the personal and social consequences related to child sexual abuse, the economic costs to society associated with law enforcement, health care, and disability is estimated to be billions of dollars each year in the United States (Miller, Cohen, & Wiersema, 1996). Despite tremendous efforts to advance the development and implementation of prevention and intervention programs over the past thirty years, child sexual abuse remains prevalent and its individual and societal impact is long-lasting.

Adolescence is a critical developmental period during which youth face a number of changes, including formation of identity, increased autonomy and independence, greater involvement with peers, and increases in internalizing and externalizing difficulties (Holmbeck & Kendall, 2002; Windle, 2000). Sexually maltreated adolescents may be
viewed as a particularly vulnerable group as they not only experience complex
developmental changes but also deal with the stressors surrounding their abuse. The
additional stressor of sexual abuse may overwhelm youth’s coping abilities and exert both
profound short- and long-term physiological and psychosocial effects (Banyard, Williams,
& Siegel, 2001; Cicchetti & Rogosch, 2001; DeBellis, 2001). Research has shown that
adolescents with a history of sexual abuse are more likely to exhibit symptoms associated
with anxiety and depression, to engage in delinquent acts and use substances, to
experience difficulties at school, and to run away from home than their non-abused peers
(Bensley, Spieker, Van Eenwyk, & Schoder, 1999; Holmes & Slap, 1998; Rotheram-
Borus, Mahler, Koopman, & Langabeer, 1996). Child sexual abuse is particularly
devastating as it is associated with an increased likelihood of suicidal ideation and
attempts. For instance, Molnar and colleagues (2001) found the likelihood of suicide
attempts to be approximately 2 to 4 times higher in females and 4 to 11 times higher in
males with a history of child sexual abuse than individuals without such a history. Given
that suicide is the third leading cause of death among adolescents and young individuals
between the ages of 10 and 24, it is critical to understand how child sexual abuse
influences psychological well-being in this group of individuals.

The present study is based upon Cicchetti and Lynch’s (1993) ecological-
transactional model of maltreatment, which acknowledges the strong contribution of
ecological processes. Cicchetti and Lynch have expanded upon Brofenbrenner’s (1986)
ecological systems theory to examine the manner in which serious disturbances in
caregiving environments, such as child sexual abuse, may influence youth development
and hinder psychological well-being. Cicchetti and Lynch’s model has been helpful in
understanding how factors from each level of the social ecology may exert reciprocal influences on one another and affect how youth adapt to their environments following sexual abuse. According to Cicchetti and Lynch (1993), risk factors associated with sexual maltreatment are present at each level of the ecology. Risk factors within a given level of the ecology may influence processes and outcomes in various aspects of youths’ environment, and these ongoing transactions determine the amount of risk sexually abused youth face. At higher, more distal levels of the ecology, such as the exosystem (e.g., community) and macrosystem (e.g., culture, society), environmental circumstances or factors increase the likelihood of conditions that negatively influence psychological well-being. Characteristics associated with the microsystem (e.g., individual and family characteristics) exert the most direct influences on youth development, as this is the level of the ecology most proximal to youth.

Higher exposure to socioenvironmental risk factors at several different levels of the social ecology represents a deviation from the average expectable environment, thus making successful achievement of stage-salient developmental tasks problematic for sexually maltreated youth (Cicchetti, Toth, & Rogosch, 2000). However, while exposure to environmental factors may impede psychological well-being among sexually maltreated youth, not all sexually maltreated youth experience difficulties. The experience of sexual abuse may function differently depending on a host of other influences that may lead to various outcomes. A considerable number of studies provide support for the negative association between child sexual abuse and mental health outcomes. However, the findings from most of the studies cited are based on investigations in which the combination of sexual abuse and other forms of child abuse is conceptualized as a risk
factor for the development of mental health problems. A number of literature reviews have suggested that, with the exception of symptoms related to posttraumatic stress disorder, the majority of these samples do not place an emphasis solely on sexual abuse (Kendall-Tackett et al., 1993). A general focus on clinical samples of children that have been abused does not take into account the importance of understanding internalizing and externalizing difficulties specific to sexually abused youth.

In examining the relations among socioenvironmental risk, social support, peer rejection, and various outcomes (e.g. depressive symptomatology, substance use, and involvement in delinquent acts), a number of gaps may be addressed in the literature. First, the present study will examine the relation between socioenvironmental risk and several potential developmental outcomes in a sample of youth with either alleged or substantiated cases of sexual maltreatment. In order to appropriately intervene, it is important to consider within-group variability among sexually abused youth. Second, the present study will examine the relationships between socioenvironmental risk and social support, seeking to facilitate the understanding of these variables as they relate to one another as well as separately to the outcomes of depressive symptomatology, substance use, and delinquency.

Third, and perhaps most importantly, the present study will examine whether socioenvironmental risk influences depressive symptomatology, substance use, and involvement in delinquent acts indirectly through peer rejection and whether the magnitude of the indirect effect is dependent upon social support. A thorough understanding of the mechanisms through which victims of childhood sexual abuse develop depressive symptoms and become involved in substance use and delinquent acts
may be especially important in guiding treatment efforts for those that have been
victimized. In recent years, researchers have begun to move beyond the exploration of
direct influences of child sexual abuse on mental health sequelae and more towards an
examination of processes underlying the pathway between child sexual abuse and mental
health outcomes (Cicchetti & Rogosch, 1997; Kim & Cicchetti, 2006). Preferably,
mediating factors would be demonstrated over time in a longitudinal study (Selig &
Preacher, 2009). However, a considerable number of longitudinal studies that have
examined mediating processes have utilized two points of data collection (Appleyard,
Yang, & Runyan, 2010; Brensilver, Negriff, Mennen, & Trickett, 2011; Kim & Cicchetti,
2006; 2004; Lynch & Cicchetti, 1998) thus rendering issues of temporal causality
problematic. True mediation is said to exist when a proposed independent variable is
related to a proposed mediator and the proposed mediator is related to a proposed
dependent variable; ideally mediation would be demonstrated across several points of data
collection. The present study seeks to contribute to existing literature by examining
whether the buffering influence of socioenvironmental risk and social support is expected
to indirectly relate to each outcome (depressive symptomatology, substance use, and
involvement in delinquent acts) through peer rejection over an extended period of time.
An examination of socioenvironmental factors associated with depressive
symptomatology, substance use, and delinquency, may assist in the development of
prevention and intervention programs and may be particularly beneficial for sexually
abused youth who are at an increased risk for psychological maladjustment during
adolescence.
Child Sexual Abuse and Mental Health Outcomes

A considerable number of studies have examined the association between child sexual abuse and mental health sequelae (Appleyard et al., 2010; Johnson, Kotch, Catellier, Winsor, Dufort, Hunter et al., 2002; Kim & Cicchetti, 2006; Maikovich-Fong & Jaffee, 2010; Trickett, Noll, Reiffman, & Putnam, 2001; Turner, Finkelhor, & Ormrod, 2006). Much of our knowledge of the detrimental effects of child sexual abuse on mental health outcomes has come from investigations in which sexual abuse has been conceptualized as the primary determinant of subsequent difficulties. Consequently, the following literature review will include investigations in which child sexual abuse has been conceptualized as a risk factor for later difficulties. Understanding how socioenvironmental factors contribute to heterogeneity in behavioral and emotional difficulties in sexually maltreated youth is essential to providing an empirical basis for interventions for this particular group and will be a focus of the proposed study.

The review will begin by describing the literature documenting the association between child sexual abuse and psychosocial adjustment (e.g. internalizing and externalizing symptomatology). The second part of the literature review will describe literature examining risk factors associated with depressive symptomatology, substance use, and involvement in delinquent acts among sexually maltreated youth as well as the role of social support in relation to psychosocial adjustment. Third, the literature review will describe the mediating influence of peer rejection in relation to a number of outcomes in sexually abused youth. Lastly, the review will conclude with discussion of the role of gender.
Child Sexual Abuse and Internalizing Disorders

In recent years, researchers have undertaken efforts to understand the impact of child maltreatment on the development of internalizing disorders (Appleyard, Yang, & Runyan, 2010; Cullerton-Sen, Cassidy, Murray-Close, Cicchetti, Crick, & Rogosch, 2008; Johnson et al., 2002; Kim & Cicchetti, 2006; Maikovich-Fong & Jaffee, 2010; Toth, Cicchetti, & Kim, 2002; Wilson & Widom, 2009). There is considerable evidence that child sexual abuse is associated with a number of internalizing problems including generalized anxiety disorder, panic disorder, phobias, and posttraumatic stress disorder (Chen, Murad, Paras, Colbenson, Sattler, Goranson, et al., 2010; Cougle, Timpano, Sachs-Ericcson, Keough, & Riccardi, 2010; Fergusson, Lynsky, & Horwood 1996; Molnar, Buka, & Kessler, 2001). Although a substantial body of research has supported the link between child sexual abuse and internalizing problems, a sizeable number of studies examining the influence of child maltreatment on the development of internalizing disorders have either been limited to adult retrospective reports of child sexual abuse or multiple maltreatment types (Appleyard et al., 2010; Schulz, Tharp-Taylor, Haviland, & Jaycox, 2009; Wilson & Widom, 2009). While examination of multiple maltreatment types has provided valuable information about specific types of maltreatment that are related to outcomes, this does not allow one to examine variation within specific types of maltreatment. Thus, our knowledge of variability among youth that have been sexually abused has been somewhat limited. Researchers have tended to use adult samples because they are easier to collect and can provide information about the long-term functioning of individuals that have experienced sexual abuse as a child (Weiss, Longhurst, & Mazure, 1999; Williams, 1994). However, the reliability of adult retrospective reports has been
called into question with regards to disclosure and timing of disclosure, thus rendering
details surrounding the abuse problematic (London, Bruck, Wright, & Ceci, 2008).

Our knowledge of the relationship between child sexual abuse and internalizing
problems has come from both cross-sectional and longitudinal studies. In a cross-sectional
examination of the influence of shame and self-blaming attributes on the development of
depression by Feiring and colleagues (1998), adolescent victims of sexual abuse reported
greater levels of depressive symptoms and lower levels of self-esteem in comparison to
child victims of sexual abuse. In addition, adolescent victims of sexual abuse were more
likely to experience shame and self-blame following the abuse in comparison to child
victims of sexual abuse. The authors posited that the differences between adolescent and
child depressive symptomatology were due to developmental factors. Specifically, the
authors concluded that the adolescents in this sample were already experiencing a number
of changes associated with the onset of adolescence, which can negatively influence the
development of internalizing symptoms. The stressors of abuse in combination with
normative stressors associated with adolescence may make victims in this developmental
period especially vulnerable to experiencing internalizing symptoms. Similar to Feiring
and colleagues, Deblinger and colleagues (1997) found that of their participants ranging in
age from 2 to 15 years, older children were more likely to report internalizing symptoms.
The authors posited that this reflects older children’s abilities to tell their parents and other
important individuals about experiencing internalizing symptoms, which may be partially
related to their advanced cognitive abilities in comparison to younger children. Taken
together, stressors associated with sexual abuse, in combination with normative stresses
and physiological changes associated with adolescence, may make adolescent victims of
sexual abuse particularly vulnerable to experiencing internalizing symptoms (Feiring et al., 1998). Although these studies have provided invaluable information documenting the association between child sexual abuse and internalizing symptoms, our knowledge would be further enhanced by examining whether there are specific ecological risk and protective factors associated with internalizing symptomatology in sexually maltreated youth.

While the studies discussed above used cross-sectional designs, longitudinal studies have also documented the relationship between child sexual abuse and internalizing problems. Fergusson and colleagues (1996) followed a cohort of children over 18 years from birth through young adulthood and obtained information related to childhood, family, social, and economic factors. Participants were asked to provide retrospective reports of childhood sexual abuse when they turned 18, and information related to mental health and personal adjustment was obtained. The authors found that the greater the severity of sexual abuse, the more likely victims were to report anxiety, depression, and attempted suicides. Among victims that experienced intercourse, approximately 64% reported depressive symptoms as opposed to 50% who experienced no sexual contact or sexual contact with no intercourse. Additionally, approximately 33% of individuals who experienced intercourse reported attempting suicide at some point in comparison to 4% for victims with no-contact abuse and 11% for individuals who experienced sexual contact with no intercourse. A follow-up study by Fergusson and colleagues (2008) with the same cohort of individuals at age 25 indicated that those who were sexually abused as children had rates of disorders that were 2.4 times higher than those who were not sexually abused. Moreover, it was estimated that exposure to child
sexual abuse accounted for approximately 13% of the mental health problems experienced by this group of individuals.

In another longitudinal study, Kim and Cicchetti (2010) examined the relations among maltreatment type (e.g. sexual abuse, physical abuse, emotional abuse, and neglect), emotion regulation, and psychopathology in children attending a day summer camp program. The authors hypothesized that maltreatment would be associated with deficits in emotion regulation at Time 1, which in turn would be associated with increased psychopathology at Time 2. Sexual abuse was defined as any sexual contact or attempted sexual contact taking place between a child and caregiver for either the caregiver’s satisfaction or financial incentives; approximately 14 percent of the sample experienced sexual abuse. The authors found that sexual abuse had a negative effect on children’s abilities to regulate their emotions. In turn, emotion dysregulation was associated with increased levels of internalizing symptomatology both concurrently and longitudinally at a one-year follow-up period. Taken together, findings from longitudinal studies have provided support for the negative effects of exposure to child sexual abuse and mental health problems later in life.

Much of our knowledge about the detrimental effects of exposure to child sexual abuse and internalizing problems has come from studies in which sexual abuse was examined in conjunction with other maltreatment types. For instance, in a study by Bolger and Patterson (2001) in which multiple maltreatment types were examined, child sexual abuse was found to be associated with more internalizing problems. In addition, the authors found that sexually abused children of lower socioeconomic status backgrounds experienced greater levels of internalizing symptoms in comparison to children of higher
socioeconomic status backgrounds; this finding indicates that children from low SES backgrounds may have been at higher risk for internalizing difficulties as a result of the additive effects of maltreatment type and socioeconomic status. Boxer and Terranova (2008) also found that sexual abuse was associated with higher levels of internalizing symptoms in comparison to physical abuse, neglect, and no maltreatment. Notably, sexual abuse accounted for the greatest amount of variation in internalizing symptoms and overall clinical impairment, as indicated by scores obtained from the Devereaux Scales of Mental Disorders (Naglieri, LeBuffe, & Pfeiffer, 1994). The findings of this study indicate that specific types of maltreatment account for varying degrees of maladjustment in abused individuals. Taken together, these findings highlight the detrimental effects of child sexual abuse on the development of internalizing symptomatology.

**Child Sexual Abuse and Externalizing Disorders**

Child sexual abuse has also been found to be related to the development of externalizing problems (Cullerton-Sen et al., 2008; Simpson & Miller 2002; Swanston, Parkinson, O’Toole, Plunkett, Shrimpton, & Oates, 2003; Trickett et al., 2001; Turner et al., 2006). Across childhood and adolescence, child sexual abuse has been associated with higher levels of acting out behaviors and has effects spanning adolescence and lasting into adulthood (Mash & Barkley, 2007). Of the various types of maltreatment, sexual abuse, in addition to physical abuse and neglect, has been found to be consistently associated with increased acting out (Feiring, Miller-Johnson, & Cleland, 2007; Lansford, Miller-Johnson, Berlin, Dodge, Bates, & Pettit, 2007; Mersky & Reynolds, 2007). In addition, some research suggests that maltreatment that is proximal to adolescence is more strongly related to delinquency than maltreatment that occurs prior to adolescence (Ireland, Smith,
& Thornberry, 2002; Stewart, Linvingston, & Dennison, 2008). For instance, Stewart and colleagues (2008) examined the relationship between child maltreatment and involvement in delinquent acts among youth that were identified as having experienced sexual abuse, physical abuse, or neglect. The authors found that maltreatment occurring proximal to adolescence was more strongly related to involvement in delinquent acts. The authors suggested that maltreated adolescents may be more likely to associate with delinquent peers, which then increases their own risk for involvement in delinquent acts. Thus, it appears that developmental timing may play a significant role in the development of delinquency.

Swanson and colleagues (2003) examined how child sexual abuse relates to delinquency, aggression, and juvenile offending among youth who were initially between the ages of 4 and 15 when they presented to hospitals and received follow-up assessments approximately nine years later. The authors found that after controlling for age, sex, socioeconomic status, and whether or not the child was living with their biological parents, child sexual abuse predicted self-reported criminal behavior and parent-reported child aggression. Although the results of this study provided evidence of the importance of child sexual abuse as a predictor of delinquent behavior and offending, the authors did not examine contextual factors in relation to delinquency, such as peer relations or family functioning. Consequently, important contextual factors may have been overlooked in examining delinquency among sexually abused youth. The development of delinquent behaviors may be viewed as contextualized outcomes of an individual’s interactions within his or her environment and underscores the importance of conducting longitudinal studies.
to examine specific ecologies (e.g. peer, school, family) as a means of better understanding delinquency among sexually maltreated youth.

A substantial body of literature has indicated that sexually maltreated youth exhibit both internalizing and externalizing symptoms (Feiring et al., 2007; Kim & Cicchetti, 2010; Trickett, Negriff, Ji, & Peckins, 2011; Turner, Finkelhor, & Ormrod, 2006). For instance, Feiring and colleagues (2007) examined potential pathways from stigmatization and internalizing symptoms to delinquency in youth with confirmed histories of child sexual abuse. Participants were interviewed initially when the abuse was disclosed and were between the ages of 8 and 15 years; they were interviewed again at 1- and 6-year follow-up periods. The authors examined a model in which stigmatization resulting from the abuse and internalizing symptoms were posited to relate to anger and involvement in delinquent acts. The results of this study indicated that stigmatization resulting from the abuse and internalizing symptoms at Times 1 and 2 may place youth at a heightened risk for delinquent behaviors at Time 3. The authors posited that the experience of internalizing symptoms may reflect a tendency to view others as threatening and subsequently to become angry and act out through involvement in delinquent acts. Not only did internalizing symptoms contribute to involvement in delinquent acts, they also occurred simultaneously with involvement in delinquent acts. The authors asserted that the persistence of the effects of early stigmatization and internalizing symptoms emphasizes the need for early interventions that target symptoms associated with stigmatization and internalizing symptoms.

In another study, Turner and colleagues (2006) examined the effects of victimization on the psychological well-being of children. Specifically, the authors were
interested in examining the independent influence of child sexual abuse on levels of depression and anger/aggression as well as additional family adversities that may account for the association between child sexual abuse and psychological well-being. Participants ranged in age from 2 to 17 years. The results of this study showed that child sexual abuse was significantly associated with depression and anger/aggression even after controlling for other types of adversity (e.g. other forms of child maltreatment, witnessing family violence). The authors posited that while various types of maltreatment tend to co-occur, they may also uniquely account for some of the variance in depressive symptoms and anger/aggression within this particular sample.

**Child Sexual Abuse and Substance Use**

The relationship between child sexual abuse and the development of substance-related problems has received considerable attention, with research showing that child sexual abuse has consistently been linked to substance use (Bailey & McCloskey, 2009; Kilpatrick, Acierno, Saunders, Resnick, Best, & Schnurr, 2000; Shin, Hong, & Hazen, 2010; Wilson & Widom, 2009). For instance, Kilpatrick and colleagues (2000) found that adolescents that were sexually maltreated were approximately 2.4 times more likely to report alcohol abuse, 1.6 times more likely to report marijuana use, and 2.6 times more likely to endorse hard drug use than non-sexually maltreated adolescents. Moreover, this relationship persisted after controlling for age, gender, ethnicity, familial drug and alcohol problems, and physical assault. Shin and colleagues (2010) also examined the relationship between child sexual abuse and patterns of adolescent substance use and found that child sexual abuse was associated with an increased risk of heavy polysubstance use in adolescent females. Similar to Kilpatrick and colleagues’ findings (2000), this relationship
persisted even after controlling for age, ethnicity, parental substance use, sibling use, peer use, other forms of psychopathology, and other forms of child maltreatment (e.g. physical abuse and neglect). While this study provided information about substance use among victims of child sexual abuse, it was cross-sectional in nature and thus precludes inferences of causality with regard to child sexual abuse and adolescent substance use.

In a review examining the relationship between childhood sexual or physical abuse and later substance use problems among adolescents and adults, Simpson and Miller (2002) found that females with histories of child sexual abuse were found to have elevated rates of substance use problems, regardless of the sample’s population of origin: mental health treatment seekers, medical clinic attendees, elementary or high school students, or the general community. The authors suggested that child sexual abuse may be an important etiologic factor in the development of substance use problems among females. However, factors that may be associated with an increased risk for substance use after participants were sexually abused were not examined.

**Socioenvironmental Risk and Youth Outcomes**

Risk factors are described as environmental conditions or variables that are associated with an increased likelihood of negative outcomes in behaviors that may compromise the health, well-being, or social functioning of individuals (Garmezy, 1983; Sameroff, 2000). It has been well documented that exposure to adverse ecological conditions places youth at increased risk for poor adaptation (Forehand, Biggar, & Kotchick, 1998; Rutter, 1979). Research has shown that the accumulation of risk factors contributes more to adverse outcomes than a single risk factor (Luster & Small, 1994; Rutter, 1979). For instance, impoverished adolescents are likely to be exposed to a
number of other adverse conditions in their family, neighborhood, and school contexts that may increase the likelihood of poor adjustment (Forehand et al., 1998; Garmezy, 1983; Luster & Small, 1994). Rutter (1979) found that as the number of risk factors increased within children’s environments, the greater the likelihood of developing a psychiatric disorder. The risk for developing a psychiatric disorder increased from 2% in families with 0 or 1 risk factors to approximately 20% in families with 4 risk factors. Research has shown that maltreated children often reside in households where multiple problems are present, such as poverty, exposure to domestic violence, parent psychopathology, and dangerous neighborhood conditions (Appel & Holden, 1998; Edleson, 1999; Jaffee, 2005). Consequently, sexually maltreated youth, especially those residing in low socioeconomic neighborhoods, may be at increased risk for exposure to psychosocial stressors, including maternal psychological distress, witnessing domestic violence within the household, poor parenting skills, inappropriate or excessive disciplining with regards to child rearing, youth’s poor ability to self-protect given the stressors within their environments, and previous reports of child maltreatment. Notably, some of the environmental conditions in high-risk families may have an impact on the psychological functioning and well-being of sexually maltreated children over and above the impact of the actual abuse. Exposure to such factors may render sexually maltreated youth at heightened risk for developing internalizing symptoms, externalizing symptoms, and substance use. As such, it is important to identify potential pathways leading to the development of internalizing symptoms, externalizing symptoms, and substance use among sexually maltreated youth, as this population is at particular risk for these and related outcomes.
Socioenvironmental Risk and Depressive Symptomatology

One of the adjustment difficulties that sexually maltreated adolescents may be likely to experience as adverse risk conditions increase is depressive symptomatology. Given that depression begins to increase in adolescence, with approximately 15% to 20% having experienced a depressive episode by mid-adolescence (Auerbach, Abela, Ho, McWhinnie, Czajkowska, 2010; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993), it is important to identify adolescents that may be at-risk for the development of depressive symptomatology (i.e. sexually abused youth). The examination of risk factors for depressive symptomatology has received more attention in recent years (Forehand et al., 1998; Gabalda, Thompson, & Kaslow, 2010; Loukas & Prelow, 2004; Mazza, Fleming, Abbott, Haggerty, & Catalano, 2010; Prelow et al., 2006). For instance, Roberts and colleagues (2009) examined risk factors for depression among adolescents that were sampled from the community and found that poor family satisfaction, low self-esteem, increased levels of neighborhood- and school-related stressors, financial strain, and strained parental relations were associated with an increased risk for depression. Additionally, the presence of multiple risk factors was shown to be account for more variance in depressive symptoms than a single risk factor. In another study examining risk factors for depressive symptoms, Mendelson and colleagues (2010) found that the cumulative effect of exposure to different types of violence (e.g. exposure to neighborhood violence, relationship violence, and forced sex) was associated with depressive symptoms. Moreover, the authors found that the violence domains assessed in their study had an additive positive association with depressive symptoms. Exposure to 2 or 3 violence
domains significantly increased the likelihood of exhibiting depressive symptoms when compared to exposure to one violence domain.

A considerable number of studies that have examined depressive symptomatology among sexually abused youth have considered sexual abuse to be a risk factor for the development of depression instead of examining contextual factors as risk factors for depression after the abuse has occurred. For instance, Weiss and colleagues (1999) found that child sexual abuse functioned as an important stressor that may increase individuals’ susceptibility to depression in adulthood through the disruption of biological processes. The authors argued that childhood sexual abuse may be conceptualized as an early stressor that predisposes individuals to depressive symptomatology later in life and called for researchers to examine potential mediators of this relationship. In their study examining the unique and cumulative effects of risk and protective factors for psychological adjustment among urban African American youth, Gabalda and colleagues (2010) conceptualized their risk composite as consisting of child maltreatment (e.g. sexual abuse, physical abuse, emotional abuse, neglect), receipt of food stamps, maternal psychological distress, child exposure to intimate partner violence, and school transition. The authors found that child maltreatment, maternal psychological distress, and receipt of food stamps emerged as the three risk factors that were uniquely associated with internalizing symptoms.

**Socioenvironmental Risk and Delinquency**

A third adjustment difficulty that sexually maltreated adolescents may be likely to experience as adverse risk conditions increase is involvement in delinquent acts. Retrospective studies examining the prevalence of child maltreatment among known
juvenile offenders suggest that approximately one to two-thirds of delinquents have experienced some form of maltreatment in addition to other contextual risk factors (Wiebush, Freitag, & Baird, 2001). A substantial amount of research has established the deleterious effects of child maltreatment on adolescent delinquency, and a growing number of researchers have begun to address the effects of cumulative risk on delinquency (Appleyard et al., 2005; Crooks et al., 2007; Loeber & Burke, 2011; Mersky & Reynolds, 2007; Tolan & Gorman-Smith, 1998). For instance, Appleyard and colleagues (2005) examined the role of cumulative risk on externalizing behaviors, delinquency and aggression in a sample of at-risk youth. The authors conceptualized their cumulative risk index as consisting of child maltreatment (e.g. sexual, physical, and emotional abuse and neglect), inter-parental violence, family disruption, life stress, and socioeconomic status. The authors’ findings provide support for a cumulative risk model, which posits that as risk increases, emotional and behavioral problems (e.g. delinquency) also increase. Although this study provided information about the cumulative effect of risk factors on externalizing behaviors, it is unclear whether this relationship pertains to children who have been sexually abused.

Crooks and colleagues (2007) examined the association between child maltreatment and delinquency and hypothesized that child maltreatment, conceptualized as consisting of sexual abuse, physical abuse, emotional abuse or neglect, along with other individual-risk factors, would be associated with delinquency. The authors found that child maltreatment, being male, and low levels of adolescent-reported parental nurturing emerged as significant predictors of delinquency. The presence of these three risk factors explained approximately 75% of the variance in delinquency 4 to 6 months after entering
high school. Although this study identified child maltreatment as a risk factor for involvement in delinquent acts, it was limited to the information available with respect to child maltreatment and was unable to obtain information related to developmental stage at time of abuse, severity of abuse, and relationship to perpetrator. Additionally, the authors did not differentiate between various forms of abuse; thus, it is unknown whether one form of abuse was more strongly associated with delinquency than another form of abuse.

In another study examining the association between child maltreatment and adolescent delinquency, Mersky and Reynolds (2007) hypothesized that the association between child maltreatment (e.g. physical abuse and neglect) and delinquency would vary as a function of exposure to different levels of aggregated risk. The aggregated risk index was based on the occurrence of 8 sociodemographic variables and was coded categorically such that the presence of 4 or more risk factors was coded 0 and 3 or fewer risk factors was coded 1. The authors found that among children with 4 or more risk factors, maltreatment was significantly associated with involvement in delinquent acts. In contrast, among children with fewer than 4 risk factors, maltreatment was not associated with involvement in delinquent acts. The findings of this study provide support for the harmful effects of exposure to multiple risk factors on involvement in delinquent acts among maltreated youth; however, the analyses excluded cases of sexual abuse due to the limited number of substantiated cases for sexual abuse. As a result, it is unclear whether the results of this study are applicable to youth with a history of sexual abuse.

**Socioenvironmental Risk and Substance Use**

A second adjustment difficulty that sexually maltreated adolescents may be likely to experience as adverse risk conditions increase is substance use. Research has shown
that the greater the number of adversities experienced, the more likely it is that substance use problems will develop (Dube, Anda, Felitti, Edwards, & Croft, 2002). For instance, Dube and colleagues (2003) examined the association between a number of adverse childhood experiences (e.g. sexual, physical, and emotional abuse; neglect; growing up in a household where substance use was prevalent; criminality of household members; family psychopathology; and family discord) and illicit drug use at 3 different ages (e.g. less than 14 years, between 15 and 18 years, and as an adult). The authors utilized a cumulative risk model to examine the relationship between the total number of risk factors and the initiation of drug use at each age period. The authors found that each adverse childhood experience was associated with a 2- to 4-fold increase in the likelihood of illicit drug use at 14 years and increased the risk for drug use in adulthood. In comparison to individuals with no adverse childhood experiences, those with five or more adverse childhood experiences were 7 to 10 ten times more likely to report illicit drug use. With regard to this particular finding, the authors stated that illicit drug use may serve as an avenue through which adolescents can escape the instability that is characteristic of their households. While this study provided information about the cumulative effect of risk factors on substance use, it is limited by the fact that all forms of child abuse (e.g. physical, sexual, and emotional abuse and neglect) were considered a risk factor for the development of substance use. Consequently, it is unclear whether there may be environmental factors that either increase or decrease the likelihood of substance use in sexually maltreated youth.

Chandy and colleagues (1996) examined substance use, school performance, and suicidal ideation among adolescents with a history of sexual abuse and/or parental alcohol
use. The authors conceptualized their risk composite as consisting of sexual abuse history and parental alcohol use. Specifically, the authors were interested in examining the differential vulnerability associated with a history of sexual abuse and parental alcohol use for these adolescents. The authors found that either the presence of sexual abuse history or alcohol-using parents was associated with substance use among adolescents. Additionally, the cumulative effect of sexual abuse history and alcohol-using parents was associated with a two-fold increase in substance use among adolescents. Kilpatrick and colleagues (2000) examined risk factors for substance use and abuse among adolescents and hypothesized that sexual assault would be associated with an increased risk of alcohol, marijuana, and hard substance use in addition to increased age, familial substance use, exposure to violence, and posttraumatic stress symptoms. The authors found that adolescents that had been sexually maltreated, witnessed violence, and who had family members with alcohol and drug use problems were at increased risk for current substance abuse and dependence.

**Role of Social Support**

Although it has been widely supported that exposure to contextual factors is associated with poor adjustment, there is considerable individual variability in outcomes among sexually maltreated youth. While there is research to suggest that sexually abused children experience more difficulties than non-abused children, there is also research to suggest that sexually abused children experience no difficulties (Fergusson & Horwood, 2003; Werner & Smith, 1982). For instance, approximately one-third of victims do not exhibit any difficulties, suggesting that there is no “typical” sexual abuse victim and heterogeneity in the difficulties exhibited by sexually abused youth. One possible
explanation for the variation in psychological functioning may be attributed to positive factors that help offset the risks experienced within the environments of sexually maltreated youth, including social support.

Social support has been broadly defined as any process through which a supportive network may promote health and well-being (Cohen, Gottlieb, & Underwood, 2000). Social support is intended to improve an individual’s ability to cope with stressful circumstances (Cohen, 2004). Many researchers have underlined the relationship between social support and physical and mental well-being among sexually maltreated youth (Eisenberg, Ackard, & Resnick, 2007; Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007; Saewyc & Edinburgh, 2010; Schulz, Tharp-Taylor, Haviland, & Jaycox, 2009; Simmel, 2007; Walsh, Dawson, & Mattingly, 2010). Youth may receive social support from a variety of sources, and this may be especially salient as they transition to adolescence. For instance, Masten and colleagues (1990) found that children who had a positive relationship with one or more caring individuals were more likely to fare better in comparison to children without such support. This individual may be a parent (Kolbo, 1996; Zimmerman, Steinman, & Rowe, 1998) or an individual within the community, such as a teacher or clergy member (Rak & Patterson, 1996). Supportive family and social environments have consistently been found to be associated with positive outcomes among sexually maltreated youth (CDC, 2009).

Several models have been proposed to help explain the relationships among exposure to stressful circumstances, social support, and psychological adjustment. One model that has received considerable attention is the stress-buffering model (Cohen & Wills, 1985; House, 1981). According to the stress-buffering model, individuals that are
experiencing high levels of stress are protected from the detrimental effects of stress by social support. Social support may contribute to positive outcomes by functioning either as a protective factor or a promotive factor. Garmezy (1983) has defined protective factors as “attributes of persons, environments, events, and situations that appear to temper predictions for psychopathology based upon an individual’s at-risk status” (p. 73).

Evidence for the buffering effect of social support can be observed only in the interaction between stress and social support (Sameroff, 2000). In other words, social support would be identified as a protective factor when individuals that are under stressful conditions and receive increased levels of social support have better outcomes in comparison to those receiving either low or no level of social support. In contrast, social support would be identified as a promotive factor when it exerts a positive effect in both high and low-risk groups of individuals. A promotive effect would be present when social support has a significant main effect on psychological adjustment over and above the influence of stressful circumstances whereas a protective effect produces an amplified effect in the presence of increased stress (Gutman, Sameroff, & Eccles, 2002).

A number of researchers have provided support for the stress-buffering hypothesis (Eisenberg et al., 2007; Gabalda et al., 2010; Holt & Espelage, 2005; Jaffee et al., 2007; Muller, Goebel-Fabbri, Diamond, & Dinklage, 2000; Saewyc & Edinburgh, 2010; Salazar, Keller, & Courtney, 2011; Simmel, 2007). Saewyc and Edinburgh (2010) examined the effectiveness of an intervention program designed to foster positive family and social relationships and to reduce emotional distress among sexually victimized girls. The authors found that among those who participated in the intervention, girls who experienced high levels of distress and had the lowest levels of support and self-esteem at baseline
benefited the greatest from the program. Notably, these participants benefited from receiving support from a family member, an identified adult at school, or an individual within the community. Schulz and colleagues (2009) examined the relationships among hypothesized protective factors, social competence, peer relationships, and psychological adjustment in children investigated for maltreatment. The authors conceptualized protective factors as variables that exert a buffering effect and “modify the effects of risk in a positive direction” (Luthar & Cicchetti, 2000). The authors hypothesized that increased levels of social competence, adaptive functioning, and peer relationships would be related to positive outcomes (e.g. fewer internalizing and externalizing symptoms and improved reading abilities). The researchers found that the positive effects of peer relationships to be associated with decreased symptomatology, even after controlling for caregivers’ depressive symptoms, alcohol use, and substance use. In addition, each hypothesized protective factor was associated with significantly associated with positive outcomes after controlling for initial levels of internalizing and externalizing symptoms and reading abilities. The results of study indicate that receiving support in the form of positive peer relationships may account for some of the variation in outcomes among maltreated youth, even after accounting for baseline characteristics.

While research has shown social support to have a buffering effect, there are a number of studies that have not found social support to have a moderating role in youth exposed to significant stressors (Bal, Crombez, Van Oost, & Debours-deaudhuij, 2003; Joseph, Williams, & Yule, 1997). For instance, in a study examining the role of social support and adolescent well-being with self-reported stressful events, Bal and colleagues (2003) found that perceived social support did not buffer against self-reported stressful
events and subsequent coping strategies. One possible explanation for this discrepant finding could be that alternative models of social support were operating in this study. A number of researchers have indicated that examining social support as a potential buffer does not shed light on potential mechanisms through which social support may influence psychological well-being (Pepin & Banyard, 2006; Runtz & Shallow, 1997; Seeds, Harkness, & Quilty, 2010). However, this has been dependent upon the questions and hypotheses set forward by researchers, and both approaches have received empirical support. Consistent with the stress-buffering model, social support is posited to have a buffering influence on mental health outcomes in the present study as it is of interest to determine whether the indirect effects of peer rejection on the relation between socioenvironmental risk and mental health outcomes differs depending upon levels of social support.

Regardless of how social support has been posited to function, it is evident that research has emphasized the importance of a supportive, caring environment in helping sexually maltreated youth achieve positive outcomes in the face of adversity. Children’s relationships with family members and other important individuals within their social networks may be especially important in buffering against negative outcomes and facilitating positive outcomes. An emphasis on understanding the relationship between social support and mental health outcomes among sexually maltreated youth may potentially contribute to the development of intervention programs aimed at enhancing positive outcomes and facilitating resilience.
Peer Rejection

In the developmental psychology literature, peer rejection is broadly described as peers’ dislike, social avoidance, or hesitation to associate with an individual child (Juvonen & Gross, 2005). Developmental researchers have operationalized peer rejection as the overall group attitude towards an individual; measures of peer rejection have been developed in which students are asked to indicate the social standings of their peers. Healthy peer relations have been found to be associated with the development of moral development and reciprocity (Hartup, 1983) while peer rejection has been associated with current and future adjustment difficulties (Ladd, 2006; Laird et al., 2001; Troop-Gordon & Ladd, 2005; Werner & Crick, 2004). Adolescence is a critical period for the development of close relationships, in which expectations regarding desirable characteristics are formed and play an influential role in the friendship selection process (Wolfe, Wekerle, Reitzel-Jaffe, & Lefebvre, 1998). As adolescents spend less time with family members, the influence of peer relations becomes increasingly important to examine, particularly within the school context. For a substantial number of youth in the United States, the school has been regarded as a primary developmental context for the formation of friendships. The daily lives of most adolescents revolve around the school setting; it is in the school where a considerable number of adolescents form friendships and deal with complex interpersonal matters found in adolescence.

Research has provided support for the idea that factors associated with the maltreating environment of children and adolescents have a negative influence on the development of peer relations, including peer rejection (Anthonysamy & Zimmer-Gembeck, 2007; Bolger & Patterson, 2001; Leve, Fisher, & DeGarmo, 2007). Studies
examining peer relations in maltreated children have shown a consistent association between child maltreatment and impaired peer relationships (Bolger, Patterson, & Kupersmidt, 1998; Fantuzzo, Weiss, Atkins, Meyers, Noone, 1998; Manly, Kim, Rogosch, & Cicchetti, 2001; Parker & Herrera, 1996; Rogosch & Cicchetti, 1994). Specifically, several domains of peer relations that have received consideration include having fewer friendships and significantly younger friends (Salzinger, Feldman, Hammer, & Rosario, 1993), having fewer meaningful and intimate peer relationships (Parker & Herrera, 1996), and receiving more negative peer ratings (Dodge, Pettit, & Bates, 1994; Rogosch & Cicchetti, 1994). Parker and Herrera (1996) found that abused children and their best friends were significantly more likely to display less intimacy than non-abused children and their best friends. Additionally, maltreated youth were more likely to display more negative affect and less positive affect than non-abused children during activities related to conversation and discussion. The findings of this study suggest that intimacy may not be characteristic of abused children’s close relationships in the same manner that it may be characteristic of non-abused children and their relationships. Additionally, the findings of this study suggest that although maltreated children are able to identify a “best” friend, they may be more likely to report confused patterns of relatedness, reporting high levels of emotional quality but yet unable to have the desired level of intimacy reciprocated within the relationship.

Dodge and colleagues (1994) followed a sample of physically maltreated youth over a five-year period and found that they were substantially more likely to be rated by peers, teachers, and mothers as more disliked, less popular, and more socially withdrawn than non-maltreated children even after controlling for family socioeconomic status.
Moreover, rejection of maltreated children by their peers was found to increase as children grew older. Anthonysamy and Zimmer-Gembeck (2007) also examined whether young children with a history of maltreatment were more likely to have impaired peer relations in comparison to children without a history of maltreatment, as indicated by peer ratings and nominations. The authors found that maltreated children were rated as being more disliked, physically and verbally aggressive, socially withdrawn, and less prosocial in comparison to non-maltreated children. Additionally, children’s interaction with their peers mediated the relation between maltreatment and whether they were liked or disliked by their peers; this finding suggests that maltreated children engaged in less positive and more negative interactions with their peers and these interactions were related to whether or not they were liked by their peers. Taken together, the results of these studies indicate that maltreated youth that are less well-received by their peers may miss out on opportunities to develop and practice appropriate social skills in which they can relate to other individuals; consequently, they may become involved in negative social interactions and peer relations, and subsequently be placed at increased risk for psychological maladjustment.

In sum, existing research documents a relationship between the negative effects of child maltreatment on the development of peer relations. However, further attention to this issue is warranted for a number of reasons. First, toddlers, preschool, and elementary-school children have been the focus of a substantial amount of research documenting the relationship between child maltreatment and peer relations. Less information is known about prosocial relatedness among maltreated youth transitioning to adolescence. Because the formation of peer relations is a stage-salient developmental task (Cicchetti & Lynch,
1995), the impact of child sexual abuse during the transition to adolescence on peer interactions may be particularly detrimental. Sexual maltreatment that is more proximal to the onset of adolescence may have a greater influence on the formation of intimate friendships and how sexually maltreated adolescents relate to other individuals. Second, a sizeable amount of research has been conducted with physically maltreated youth and less research has examined peer rejection among sexually maltreated youth (Elliott, Cunningham, Linder, Colangelo, & Gross, 2005; Salzinger, Feldman, Ng-Mak, Mojica, & Stockhammer, 2001; Salzinger et al., 1993). Third, while the studies described above have consistently documented the relationship between maltreatment and impaired peer relations, fewer studies have examined whether the presence of environmental risk factors may be associated with peer rejection in sexually maltreated youth. Thus, our understanding of individual variation in peer relations among sexually maltreated youth is less developed. Given the negative outcomes that have been noted among sexually maltreated youth, it is critical to identify factors that may be related to psychological adjustment among this at-risk group of individuals.

**Peer Rejection as a Potential Mediator**

A number of researchers have examined the mediating influence of peer rejection and have provided support for the role of peer rejection as a mediator in relation to a number of outcomes among maltreated youth, including mental health and psychological well-being (Hanish & Guerra, 2000; Laird, Jordan, Dodge, Pettit, & Bates, 2001; Ostrov, 2008; Pedersen, Vitaro, Barker, & Borge, 2007; Wei & Chen, 2009). For instance, Anthonysamy and Zimmer-Gembeck (2007) examined whether children with a history of maltreatment experienced greater difficulties with peer relationships and classroom
behaviors in comparison to children without a history of maltreatment and whether children’s interactions with peers mediated the relations between maltreatment and problematic peer relations. Children provided information about their classmates with regards to whether they liked or disliked them, and the Preschool Social Behavior Scale (Crick, Casas, & Mosher, 1997) was used to examine children’s interactions with their classmates (e.g. physical aggression, verbal aggression, prosocial behaviors, and withdrawal). Results indicated that young maltreated children are less likely to be liked and more likely to be rejected in comparison to non-maltreated children. In addition, children’s interactions with their peers mediated the association between maltreatment and peer ratings. While these findings suggest that maltreated children’s interactions influence the relationship between maltreatment and peer acceptance, it is unclear whether peer rejection was related to negative interactions with classmates or whether negative interactions were related to increased rejection from peers. Consequently, temporal sequencing cannot be determined. In another study, Kim and Cicchetti (2010) found that among those that were maltreated (e.g. neglect, physical/sexual abuse), decreased emotion regulation at Time 1 was related to greater externalizing symptomatology at Time 1 that contributed to peer rejection at Time 2, which in turn was related to greater externalizing symptomatology at Time 2. Conversely, increased emotion regulation was related to greater peer acceptance over time, which in turn was associated with decreased levels of internalizing symptoms. The findings of this study suggest that there may be different pathways in the relation between emotion regulation and psychopathology, depending on whether maltreated youth were accepted or rejected by others. Taken together, these studies highlight the importance of peer rejection as a mediator in relation to a host of
outcomes. However, there are a number of limitations in the studies discussed above that may not allow for generalizations to sexually maltreated youth. As a result, our understanding of the mediating role of peer rejection in sexually maltreated youth is limited.

**Gender Variations among Children who have been Sexually Maltreated**

Much of what is known about the correlates and sequelae of child sexual abuse is based on samples consisting exclusively of female victims (Bailey & McCloskey, 2009; Valente, 2005). It was not until the 1980s that researchers began to include male victims of child sexual abuse in their samples (Finkelhor, 1984); this may be due in part to the historical underreporting and lack of awareness of child sexual abuse among male victims. While studies that include sexually abused boys are becoming more prevalent, exclusively male samples are rare, typically consist of thirty or fewer participants (Feiring, Taska, & Lewis, 1999), and usually consist of adult men reporting retrospectively on their experience with child sexual abuse (Briggs & Hawkins, 1995). Much of what is known about how child sexual abuse affects boys is derived from case studies, anecdotal reports, and qualitative studies (Durham, 2003).

Studies that have included examinations of child sexual abuse in both boys and girls have yielded inconsistent findings, with some studies suggesting that child sexual abuse affects boys and girls differently (Fontanella, Harrington, & Zuravin, 2000) and other studies finding no gender differences in the effects of child sexual abuse (Calam, Horne, Glasgow, & Cox, 1998; Maikovich-Fong & Jaffee, 2010; Young, Bergandi, & Titus, 1994). In an examination of risk factors for the development of psychological disturbance among sexually maltreated children, Calam and colleagues (1998) did not find
any gender differences with regard to emotional and behavioral indicators of disturbance, such as depressive symptoms and sleep difficulties. Young and colleagues (1994) also investigated the effects of sexual abuse on male and female children and examined sex differences in the areas of depression, self-concept, interpersonal problems, and levels of aggression. The authors examined gender differences in the areas of depressive symptoms, interpersonal relationship difficulties, and levels of aggression as a means of distinguishing between male and female reactions to sexual abuse. Data were analyzed using MANOVA procedures and showed that there was no interaction effect of the sexually abused group by gender, disconfirming the hypothesis that among the sexually abused group there would be significant gender differences in depressive symptoms, interpersonal relationship difficulties, and levels of aggression. This finding provides support to the idea that there may be more similarities than differences between male and female victims of child sexual abuse.

Maikovich-Fong and Jaffee (2010) examined sex differences in child sexual abuse characteristics and victims’ behavioral and emotional problems and hypothesized that a number of abuse characteristics (e.g. whether or not the abuse was substantiated, whether or not the abuse was penetrative, and other types of maltreatment experienced) would be equally associated with psychopathology in boys and girls. The results of this study revealed sex differences with regard to the prevalence of two abuse characteristics; girls were more likely to have their abuse substantiated and to have experienced penetrative abuse. However, despite sex differences in the prevalence of these two abuse characteristics, there were no differences between male and females in the severity of internalizing, externalizing, and trauma symptoms. The findings of this study suggest that
while there may be specific characteristics of sexual abuse that are more common in females than males (e.g. substantiated cases and penetrative abuse), these characteristics appear to affect both boys and girls in a similar fashion.

**The Present Study**

There is considerable evidence that socioenvironmental risk is related to poor outcomes among youth and may be especially detrimental for youth exposed to child sexual maltreatment (Appleyard et al., 2005; Crooks et al., 2007; Gabalda et al., 2010; Kilpatrick et al., 2000; Mersky & Reynolds, 2007; Weiss et al., 1999). The literature also provides support that despite living in high-risk environments, sexually maltreated youth may function well and be successful. A better understanding of the relations among socioenvironmental risk, social support, peer rejection, and various outcomes (i.e. depressive symptomatology, substance use, and delinquency) may be beneficial for individuals working directly with youth victims of sexual maltreatment and their families. Additionally, much of the research that has examined outcomes among maltreated youth has relied on retrospective reports or has not focused exclusively on sexually maltreated youth. In order to better understand the influence of socioenvironmental risk on various outcomes (i.e. depressive symptomatology, substance use, delinquency) in sexually maltreated youth, it is important for research to address these areas among youth as they transition to adolescence.

The present study may potentially contribute to existing literature by prospectively examining a variety of outcomes (e.g. depressive symptomatology, substance use, involvement in delinquent acts) in a subset of youth with either alleged or substantiated cases of sexual maltreatment. The present study will examine a model based on Cicchetti
and Lynch’s ecological-transactional model of maltreatment (Cicchetti & Lynch, 1993) to examine a mediated-moderation model (see Figures 1a, 1b, 1c). It is hypothesized that peer rejection will partially mediate associations between socioenvironmental risk and each outcome (e.g. depressive symptomatology, substance use, and delinquency) and social support and each outcome (e.g. depressive symptomatology, substance use, and delinquency). Socioenvironmental risk is expected to predict greater rejection from peers and in turn, increased levels of depressive symptomatology, substance use, and delinquency. It is further hypothesized that social support is expected to negatively relate to peer rejection and in turn, negatively relate to decreased levels of depressive symptomatology, substance use, and delinquency. Social support is expected to buffer against the harmful effects of socioenvironmental risk on depressive symptomatology, substance use, and delinquency and this relation will be less significant when peer rejection is taken into consideration. Specifically, for sexually maltreated youth with increased levels of social support, socioenvironmental risk is expected to be less strongly related to peer rejection, and peer rejection is expected to be less strongly related to depressive symptoms, substance use, and involvement in delinquent acts. Alternately, for sexually maltreated youth with decreased levels of social support, socioenvironmental risk is expected to be more strongly related to peer rejection, and peer rejection is expected to be more strongly related to depressive symptoms, substance use, and involvement in delinquent acts.

In mediated-moderation models, the path from the predictor to the mediator (e.g. socioenvironmental risk to peer rejection) depends on the level of the moderator (e.g. social support) whereas the effect of the mediator on the outcome (e.g. emotional and
behavioral problems) remains steady (Morgan-Lopez & MacKinnon, 2006). One advantage of this approach is that it allows for the examination of the conjoint influences of risk and protective factors on outcomes and may reveal how protective factors influence maladaptive pathways (Appleyard et al., 2010). Such analyses may point to subgroups of individuals for whom interventions may be most effective.
Chapter II: Method

Procedure

A secondary data analysis was conducted using data from the National Survey of Child and Adolescent Well-Being (NSCAW). A national longitudinal study, the primary objective of NSCAW was to examine individual and contextual factors among youth on the rolls of Child Protective Services, including family circumstances and environmental factors. NSCAW aimed to provide an in-depth understanding of how child, family, community, and service factors influence children’s well-being. Furthermore, NSCAW aimed to address critical policy, program, and public health issues in relation to the child welfare system.

The total NSCAW Child Protective Services (CPS) sample was comprised of approximately 5,501 children between the ages of 0 and 14 at the first data collection who were the subjects of child abuse or neglect investigations conducted by CPS and who lived in states in the U. S. not requiring first contact with a CPS agency staff member. Participants were selected using a two-stage stratified sampling design. During the first part, the United States was divided into nine sampling strata, with eight strata corresponding to the eight states with the highest child welfare caseloads and the ninth strata consisting of the remaining forty-two states and the District of Columbia. From this, primary sampling units (PSUs) were created within each of the nine strata and were sampled using a proportionate-to-size procedure that gave a higher probability of selection to PSUs with higher caseloads.

Within each PSU, children were selected from records of children who were investigated for child abuse or neglect between October 1999 and December 2000. Each
month, agencies provided records that contained all children that were under investigation for child abuse or neglect in the previous month. Children were excluded from participation if they were a sibling of a child that was previously selected for participation, or if they were being investigated as a perpetrator of abuse. The present study took advantage of three waves of data from NSCAW. Wave 1 data collection took place between November 1999 and April 2001, Wave 3 data collection took place between April 2001 and September 2002, and Wave 4 data collection took place between August 2002 and February 2004.

Prior to data collection, both active consent and passive consent processes were implemented depending on the state in which data was collected. NSCAW utilized a narrow definition of “serious ongoing abuse” to guide its mandatory reporting requirements that permitted individuals to alert authorities about ongoing serious situations. Questions pertaining to sensitive topics were asked using the Automated Computer Assisted Survey Interview (ACASI) in order to increase the response rate to questions about sensitive issues. Child participants who were ten years or younger were provided with a $10 gift certificate to a local toy store, and child participants who were eleven years or older were provided with a $10 gift certificate to a local music or video store.

Due to the sensitive nature of the subject content, vulnerabilities of children selected for participation, and risks to participating families, NSCAW underwent a thorough and rigorous Institutional Review Board (IRB) process. Special attention was given to the content of consent forms, mandatory reporting requirements, payment of participants, communication of updated information with regards to adverse circumstances.
(e.g. reporting of suspected child abuse or neglect, distressed respondents), and the data release plan for NSCAW. Prior to data collection, a number of NSCAW project staff were required to submit IRB review packages; this included the University of North Carolina at Chapel Hill, the University of California at Berkeley, Duke University, San Diego Children’s Hospital, and the University of Pittsburgh University Medical Center. In addition, IRB approval was obtained from the University at Albany in order to conduct secondary analyses of data collected through NSCAW.

Participants

For the purposes of the proposed study, data were drawn from 269 youth between the ages of 10 and 14 at Wave 1 with alleged or substantiated cases of child sexual maltreatment. Only sexually abused youth were included in the present study because it was a primary focus to examine outcomes (i.e. depressive symptomatology, substance use, delinquency) in youth with either alleged or substantiated cases of sexual abuse. The selection of participants included in the present study was based upon NSCAW’s description of sexual abuse. Sexual abuse referred to either alleged or substantiated cases of sexual abuse or exploitation by an individual that is responsible for the child’s welfare. An allegation was defined as an “assertion that a parent, caregiver, or other, as defined under state law, caused or allowed the child to be objected to sexual abuse” (NDCAN, 2002, p. 106) whereas substantiated was defined as “a type of investigation/assessment disposition that is used when the maltreatment or risk of maltreatment was supported or founded by state law or state policy” (NDCAN, 2002, p. 114). Participants ranged in age from 10 to 14 years at Wave 1 ($M = 12.07$ years, $SD = 1.45$; 212 females; 57 males) whose ethnic identification was Black/Non-Hispanic ($n = 75$; 27.9%), White/Non-Hispanic ($n =$
Participants ranged in age from 11 to 16 years at Wave 3 ($M = 13.38$ years, $SD = 1.53$) and from 12 to 17 years at Wave 4 ($M = 14.70$ years, $SD = 1.51$). At Wave 1, participants and their families were classified into one of five categories based upon total family income over the past year: (1) $0 - $9,999; (2) $10,000 - $19,999; (3) $20,000 - $29,999; (4) $30,000 - $39,999; and (5) $40,000 and above. The mean income score of participants and their families at Wave 1 was 2.29 (SD = 1.99).

Measures

Research has indicated that youth are capable of reliably and validly reporting symptoms in self-report questionnaires and interviews (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998; Lundqvist, Rugland, Clench-Aas, Bartonova, Hofoss, 2010). There is also increasing evidence to suggest that other informants of youth symptomatology, such as parents, may be insensitive to information that may be indicative of youth symptomatology (Angold, Weissman, John, Merikangas, Prusoff, Wickramaratne et. al, 1987; Chi & Henshaw, 2002; De Los Reyes & Prinstein, 2004; Treutler & Epkins, 2003). For instance, a number of studies have shown that across a variety of ages, children reported greater levels of depressive symptomatology than their parents report them to have (Gartstein, Bridgett, Dishion, & Kaufman, 2009). It has been posited that the increased levels of depressive symptomatology reported by children, in comparison to their parents’ reports, represent parental insensitivity to details and circumstances contributing to current levels of youth-reported symptomatology. This is consistent with reports in which information gathered from adults has typically been found to underestimate symptomatology when compared to information gathered directly from the
individual (Angold et al., 1987; Gartstein et al., 2009). Moreover, it may be particularly difficult to obtain valid and reliable information from parents about youth symptomatology when the home and community environments of the parent and child are characterized by a number of stressors. Consequently, the present study will primarily focus on symptomatology reported by youth, rather than information obtained from parents and caregivers.

**Socioenvironmental risk.** A cumulative risk factor index was computed taking all seven possible risk factors into consideration (e.g., income, maternal psychological distress, witnessing domestic violence within the household, prior reports of child maltreatment, poor parenting skills, inappropriate or excessive disciplining with regards to child rearing, and youth’s poor ability to self-protect given the stressors within their environments). Each possible risk factor will be coded dichotomously and assigned either a value of 0 (risk absent) or 1 (risk present). The total number of risk factors was summed to yield a cumulative risk score ranging from 0 to 7. Items comprising the risk factor index were drawn from caseworker responses to NSCAW project-developed questions. At the time of the investigation, caseworkers were asked whether (a) the primary caregiver had a history of serious mental health or emotional problems, (b) there was a history of domestic violence against the primary caregiver, (c) any previous reports of child maltreatment reported to the agency, (d) the primary caregiver engaged in behaviors perceived as poor parenting skills (e.g. failure to supervise or monitor children adequately), (e) the primary caregiver engaged in harsh or excessive disciplining with regards to childrearing, and (f) whether the child has a poor ability to protect him or herself given their environmental circumstances.
Social support. The Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) Resiliency Scale (Runyan, Curtis, Hunter, Black, Kotch, Bangdiwala, et al., 1998) was used to examine social support resources within children’s environments that may facilitate positive outcomes. The items for the LONGSCAN Resiliency Scale were project developed after a review of existing measures of adolescent resilience. The LONGSCAN Resiliency Scale consists of seven questions, and participants responded either “1 = Yes” or “2 = No” with the exception of two questions pertaining to religion or spirituality (see Appendix). To reflect consistency in how these items are coded, these two items were converted to a dichotomous factor and assigned either a value of 1 (social support present) or 2 (social support absent). Sample items include “Do you feel you can go to a parent or someone who is like a parent with a serious problem?” and “Has there ever been an adult outside of your family who has encouraged and believed in you?” Total positive factor scores were created by summing standardized scores, with higher scores denoting increased levels of positive factors. For the present study, the internal consistency of the LONGSCAN Resiliency Scale was adequate (α = .81; Runyan et al., 1998), and the LONGSCAN Resiliency Scale has been found to be associated with the Social Competency Scale of the Youth Self Report (ranging from .11 to .31).

Peer rejection. The Loneliness and Social Dissatisfaction Scale (Asher, Hymel, & Renshaw, 1984; Asher & Wheeler, 1985) was used to examine feelings of loneliness, social adequacy vs. inadequacy, and appraisals of whether important relationship provisions are being satisfied within the context of a school setting. The Loneliness and Social Dissatisfaction Scale consists of 16 items and are rated along a five-point Likert scale ranging from “1 = Never” to “5 = Always.” Sample items include “It’s easy for me
to make new friends at school” and “I don’t have any friends at school.” The score was based on the sum of the 16 items, with higher scores denoting greater levels of perceived rejection from peers at school. The internal consistency of the Loneliness and Social Dissatisfaction Scale in the present study was good (α = .89; Grogan-Kaylor, Ruffolo, Ortega, & Clarke, 2008).

**Outcome Measures**

**Depressive symptomatology.** The Children’s Depression Inventory (CDI; Kovacs, 1992) was used to examine depressive symptomatology. The CDI is a 27-item self-report measure of cognitive, affective, and behavioral symptoms of childhood depression and is a downward extension of the Beck Depression Inventory (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961). Each item consists of statements with scores ranging from zero to two, in order of increasing severity. Previous studies have established adequate levels of internal consistency, test-retest reliability, and construct, convergent, and predictive validity (Blumberg & Izard, 1986; Kazdin et al., 1983; Lobovits & Handel, 1985; Saylor et al., 1984). Previous studies, including prior analyses of NSCAW, have shown the CDI to have adequate internal consistency (α = .71 to .88; Kolko, Hurlburt, Zhang, Barth, Leslie, & Burns, 2010; Kovacs, 1992). The internal consistency of the CDI in the present study was good (α = .84).

**Substance use.** The Drug Free School Community Act Outcome study questions from the Drug Free Schools and Communities Act of 1986 was used to examine substance use. The Drug Free School Community Act Outcome study questions consist of 14 items that ask individuals about self-reported knowledge, attitudes, and behaviors regarding the use of alcohol and other drugs. Items are rated along a six-point Likert scale ranging from
“1 = 1 day” to “6 = 20 days or more.” Sample items include “In your whole life, on how many days have you smoked a cigarette?”; “In the last thirty days, on how many days did you smoke a cigarette?”; “In your whole life, on how many days did you drink an alcoholic beverage including beer, wine, wine coolers, and liquor”; and “In the last thirty days, on how many days did you drink an alcoholic beverage?” The substance use score included substances that were reported to be used most frequently by youth in the present study, alcohol, cigarettes, and marijuana. Williams & Nelson-Gardell (2011) have found the internal consistency of the Drug Free School Community Act Outcome study questions, as reported by youth to be good (α = .90). In the present study, the internal consistency of the Drug Free School Community Act Outcome study questions was good (α = .87).

**Delinquency.** The Delinquency subscale of the Youth Self-Report (YSR; Achenbach, 1991) was used to examine youth participation in delinquent activities. The YSR is a widely used, well-established instrument with good psychometric properties (Achenbach, 1991). The Delinquency subscale of the YSR consists of eleven items related to stealing, lying, cheating, and use of alcohol and other drugs. Items are rated along a three-point Likert scale ranging from “0 = Not true” to “2 = Very often true.” Sample items include “I don’t feel guilty after doing something I shouldn’t” and “I lie or cheat.” Total delinquency scores was created by summing items, with higher scores denoting increased levels of involvement in delinquent activities. James and colleagues (2009) have found the internal consistency of both the total YSR scale (α = .90) and the Delinquency subscale to be adequate (α = .76). The internal consistency of the Delinquency subscale of the YSR in the present study was adequate (α = .75).
Chapter III: Results

Results are presented in several sections. The first section discusses power analyses that were conducted and the second section discusses analyses that were conducted in the calculation of the risk factor score. The third section examines descriptive statistics and zero-order relationships among study variables. The fourth section examines path analytic models designed to investigate study hypotheses.

Power Analysis

The MPlus statistical software program (Version 6.0; Muthén & Muthén, 2010) was utilized as a means of determining a priori statistical power. MPlus allows researchers to use Monte Carlo methodology to determine the power within the context of a given model, sample size, and data set. Monte Carlo studies in SEM research are typically used to examine test statistics under various conditions manipulated by the researcher, such as sample size, degree of model misspecification, and extent of data non-normality (Paxton, Curran, Bollen, Kirby, & Chen, 2001). However, Muthen & Muthen (2002) have utilized the Monte Carlo method to determine power when designing SEM studies. The Monte Carlo method requires specification of an $H_1$ model containing the population values of all parameters. Samples are randomly generated based on the population values of the model. The model is estimated in each sample, and the results of these analyses (e.g. parameter values, standard errors) are averaged across samples. These averages are used to determine the power of the estimates, such as the proportion of samples in which the parameter is significantly different from zero. Muthen and Muthen (2002) have determined the following criteria to be appropriate in determining sample size: (1) the bias of the parameters and their standard errors do not exceed 10% for any parameter in the model;
(2) for parameters that are the specific focus of the power analysis, bias of their standard errors do not exceed 5%; and (3) coverage is between .91 and .98. Appropriate sample size is determined when the power of the salient model parameters is .80 or above (Cohen, 1988). For the proposed study, results of the Monte Carlo simulation were based on 500 replications and meet all of the criteria listed above for a sample consisting of approximately 269 individuals (power = .78).

**Formation of the Risk Factor Score**

Two a priori criteria were used to confirm that each of the variables (e.g. income, maternal psychological distress, witnessing domestic violence in the household, prior reports of child maltreatment, poor parenting skills, inappropriate or excessive disciplining with regards to child rearing, and youth’s poor ability to self-protect given the stressors within their environments) comprising the risk factor score functioned as risk factors (Sameroff, Seifer, & Bartko, 1997). The first criterion, an association between the risk variable and at least one of the three outcomes (e.g. depressive symptoms, substance use, and involvement in delinquent acts) was supported. The second criterion was that a significant difference exists between youth that were exposed to a particular risk and youth that were not exposed to a particular risk with regards to one of the outcomes. For instance, for poor parenting skills, it was examined whether a significant difference existed in one of the outcome variables between youth with parents having poor parenting skills and youth with parents without poor parenting skills. The results of t-tests conducted for risk variables between the present and absent risk groups suggested that a significant difference exists between the groups in at least one of the three outcomes. The dichotomous risk factors were summed to yield a cumulative risk score, ranging from 0 to
The mean number of risks was 2.85 ($SD = 1.60$). The distribution of risk scores varied, with 10 individuals who had no risk factors and 2 individuals who had all seven risk factors (see Table 1).

**Descriptive Statistics and Zero-Order Relationships**

Correlations, means, and standard deviations for the main study variables are presented in Tables 2 and 3 for the entire sample and separately by gender. Descriptive statistics with regards to the outcome variables, depressive symptoms, substance use, and involvement in delinquent acts, are presented in Tables 4 and 5. Initial levels of depressive symptoms, substance use, and involvement in delinquent acts were included to control for the initial effects of these variables. As hypothesized, socioenvironmental risk at Wave 1 was significantly correlated with depressive symptoms and substance use at Wave 4. In contrast, socioenvironmental risk at Wave 1 was marginally associated with peer rejection at Wave 3 and was not associated with involvement in delinquent acts at Wave 4. Peer rejection at Wave 3 was significantly associated with depressive symptoms and involvement in delinquent acts at Wave 4 but was not associated with substance use at Wave 4. Social support at Wave 1 was negatively associated with peer rejection at Wave 3 and depressive symptoms at Wave 4; however, social support at Wave 1 was not associated with reports of substance use and involvement in delinquent acts at Wave 4. In addition, all three outcomes at Wave 4, depressive symptoms, substance use, and involvement in delinquent acts, were significantly associated with one another. As can be seen in Table 4, the percentage of youth reporting depressive symptoms in the clinically significant range decreased from Wave 1 to Wave 4 and the percentage of youth reporting
involvement in delinquent acts in the clinically significant range remained relatively stable from Wave 1 to Wave 4.

Of the 269 participants included in the present study, 48 individuals had substantiated cases of sexual maltreatment. Questions related to the individual responsible for the abuse were asked of all participants; however, limited information was provided, with approximately 213 (79.2%) participants indicating that they would like to skip or not provide a response. Of the remaining 56 participants, 18 participants reported abuse by a male relative, 5 participants reported abuse by a female relative, 5 participants reported abuse by their mothers’ boyfriend, 7 participants reported abuse by a friend, and 21 participants did not provide any response to this question. Questions related to types of sexual abuse were asked of all participants; however, limited information was provided, with approximately 220 (81.9%) participants indicating that they would like to either skip or not provide a response. Of the remaining 49 participants, 17 participants reported fondling/molestation, 9 participants reported vaginal or anal intercourse, 8 participants in reported masturbation, 6 participants reported digital vaginal or anal penetration, 4 participants reported oral copulation of adult or child, and 5 participants reported a less severe type of sexual abuse.

A higher percentage of caregivers reported experiencing high levels of stress within the family (49.8%) in comparison to caregivers reporting low levels of stress (40.5%) and caregivers indicating that they were unsure of the amount of stress experienced within their families (9.7%). However, a larger percentage of the sample reported having adequate levels of social support (52%) in comparison to those reporting low levels of social support (36.8%) or those indicating that they were unsure of the
amount of support they received (19.2%). The majority of caregivers reported being
employed on at least a part-time basis (65.8%) in comparison to those reporting that they
are not employed (34.2%). Approximately two-thirds of the youth in the present study
(66.2%) reported participating in outpatient treatment services in the past. In addition, it is
noted that a portion of youth participated in a peer support group at school (20.8%),
attended a community center (17.1%), and received family services (16%).

Prior to examining the study hypotheses, Box’s M procedure (Box, 1949) was
conducted to determine whether the variance and covariance matrices of the relationships
among the variables differ across gender groups. The results showed no significant
differences across gender with regards to the relationships among the variables to be
included in the proposed study, socioenvironmental risk, social support, peer rejection,
depressive symptomatology, substance use, and involvement in delinquent acts (Box’s $M =
30.74$, $p = .22$). This supports the decision to examine the hypothesized model by
combining males and females. Additionally, Box’s M procedure was examined to
determine whether the variance and covariance matrices of the proposed variables differ
for alleged versus substantiated cases of sexual maltreatment. The results showed no
significant differences for alleged versus substantiated cases of sexual maltreatment with
regards to the relationships among the variables to be included in the proposed study,
socioenvironmental risk, social support, peer rejection, depressive symptomatology,
substance use, and involvement in delinquent acts (Box’s $M = 35.41$, $p = .13$). This
supports the decision to examine the hypothesized model by combining alleged and
substantiated cases of sexual maltreatment.
Overview of Data Analytic Strategy

The overall fit of the hypothesized model was tested with path analytic models using MPlus statistical software (Version 6.0; Muthén & Muthén, 2010). There are a number of advantages to using MPlus for the present study, including its ability to deal with models with categorical and non-normally distributed data, missing data, and indirect effects with a range of estimation options. Analyses were conducted using full-information maximum likelihood (FIML) data estimation procedures, which generate more efficient and less biased parameter estimates than more traditional methods of dealing with missing data, such as listwise deletion (Schafer & Graham, 2002). FIML is appropriate when data are considered to be missing-at-random, which assumes that the probability that an observation is missing on variable X can depend on another observed variable, but not the values of X itself. The missing-at-random assumption is considered less restrictive in the sense that the observed values do not need to be randomly selected from a hypothetically complete dataset (Enders & Bandalos, 2007). FIML procedures use all information from the observed data, including the mean and variance of the missing portions of a variable, in relation to the observed portions of other variables (Wothke, 1998). Based on these procedures, analyses in the present study were limited to 257 individuals without any missing values on the predictor variables.

Evaluation of model fit. Model fit is typically assessed with the chi-square statistic, with a non-significant $p$ value indicating an overall better fit. The chi-square statistic has been found to be misleading for a number of reasons. For instance, the larger the sample size, the more likely the rejection of the model and the likelihood of a Type II error occurring (Raykov & Marcoulides, 2006). Consequently, many researchers believe
that with an adequate sample size (> 200) and good approximate fit as indicated by other fit indices, the significance of the chi-square test may be interpreted less stringently. Due to the limitations noted above by the chi-square goodness-of-fit index, model fit was assessed with the following indices: the comparative fit index (CFI), the Tucker Lewis index (TLI), and the root mean square error of approximation (RMSEA). The CFI and TLI both indicate how much better the model fits the data than a null model; values can range between zero and one, with a value of one indicating a perfect fit. RMSEA has been conceptualized as an index of badness of fit. Values below .1 have been considered acceptable while others have argued that a more stringent criterion of .08 for the RMSEA would indicate a reasonable error of approximation (Byrne, 1998). It is important to note that a perfect model fit is rarely attainable and that it is not necessary for a model’s fit to meet all of the above criteria in order to be considered acceptable (Hatcher, 1994). Consequently, model fit was considered acceptable if the majority of the fit indices suggested adequate fit.

**Mediated-moderation analyses.** The hypothesized model in the present study was examined following procedures outlined by Morgan-Lopez and MacKinnon (2006). Moderation means that the influence of a variable on a particular outcome is altered, or moderated, by another variable and is typically described as an interaction of two variables. If moderation is mediated, then the typical pattern of mediation is occurring; however, the X variable is an interaction and is referred to as mediated-moderation. Baron and Kenny (1986) first described a method for examining mediated-moderation, which involves first showing an interaction effect of X (e.g. socioenvironmental risk) and W (e.g. social support) on Y (e.g. depressive symptoms, substance use, involvement in delinquent
acts) and then introducing a mediator of that interaction effect. In the Baron and Kenny (1986) approach, the effects of the predictor variables on the outcome variables are first assessed. Second, the effects to and from the proposed mediator are examined. Next, the effect from the interaction is examined. If the interaction affects the outcome in the first step and is weakened when the mediator is included, one may conclude that this variable mediated the effect of the interaction on the outcome.

Morgan-Lopez and MacKinnon (2006) have described mediated-moderation as involving the interaction effect between two predictor variables on a mediator which then affects an outcome. Put in another way, the path from the predictor variable to the mediator (e.g. $X \rightarrow M$) depends on the level of the moderator, $Z$, whereas the effect of the mediator on the outcome (e.g. $M \rightarrow Y$) remains constant. In the present study, the indirect influence will be examined using the products of coefficients test (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; MacKinnon, Lockwood, & Williams, 2004). This procedure utilizes the coefficients of the paths in the mediation model to test for the joint estimation of mediating variable influences on the outcome, where path $a$ is the path between the interaction of the predictor variable (e.g. socioenvironmental risk) and the proposed moderator (e.g. social support) and the proposed mediator (e.g. peer rejection) and path $b$ is the path between the proposed mediator (e.g. peer rejection) and each outcome (e.g. depressive symptoms, substance use, and involvement in delinquent acts). In order to test for this interaction, the product coefficients terms for path $a$ and path $b$ will be computed. The products of coefficients test of mediation has been considered preferable to the traditional causal steps test (Baron & Kenny, 1986) because it allows for a joint estimation of mediating variable effects and because the causal steps test has been
shown to be underpowered (MacKinnon et al., 2002). To test the significance of the indirect effect of the predictor variable on the outcome variable through the mediator, the Goodman version (1960) of the Sobel formula (1982) was examined. The Goodman test equation \( \text{SE}_{ab} = \left[ (b^2 \cdot s^2_a) + (a^2 \cdot s^2_b) - (s^2_a \cdot s^2_b)^{1/2} \right] \) produces the standard error of the indirect effect, and a statistically significant \( Z \) value indicates the presence of mediation.

**Examination of the Hypothesized Model with Depressive Symptoms as an Outcome**

Results of the hypothesized model with depressive symptoms at Wave 4 as an outcome are presented in Figure 2a. Estimation of the hypothesized model for the entire sample showed acceptable levels of fit when examining depressive symptoms at Wave 4 (RMSEA = .05, CFI = .92, TLI = .93). Examining the total effects of socioenvironmental risk at Wave 1, social support at Wave 1, peer rejection at Wave 3, and depressive symptoms at Wave 4, no socioenvironmental risk by social support interaction existed after controlling for initial levels of depressive symptoms \( (B = .05, SE_B = .06, p = .12) \); that is, the indirect effect of socioenvironmental risk at Wave 1 on depressive symptoms at Wave 4 through peer rejection at Wave 3 did not vary as a function of social support at Wave 1. The entire model accounted for approximately 22% of the variance in depressive symptoms at Wave 4, with depressive symptoms at Wave 1 accounting for approximately 17% of the variance in depressive symptoms at Wave 4.

Removing the interaction term, tests for mediation were conducted separately with socioenvironmental risk at Wave 1 and social support at Wave 1 as predictors. Mediation was not pursued with socioenvironmental risk at Wave 1 due to a marginal association between socioenvironmental risk at Wave 1 and peer rejection at Wave 3 \( (B = 1.11, SE_B = .61, p = .07) \). While mediation was not pursued in further detail with socioenvironmental
risk at Wave 1 as a predictor, several significant paths were observed. Socioenvironmental risk at Wave 1 was significantly associated with depressive symptoms at Wave 4 (\(B = .92, SE_B = .38, p < .05\)) and peer rejection at Wave 3 was significantly associated with depressive symptoms at Wave 4 (\(B = .43, SE_B = .16, p < .01\)). However, these paths were no longer significant after accounting for initial levels of depressive symptoms (see Table 6). The path between peer rejection at Wave 3 and depressive symptoms at Wave 4 approached significance after accounting for depressive symptoms at Wave 1.

Social support at Wave 1 was significantly associated with depressive symptoms at Wave 4 (\(B = -1.53, SE_B = .51, p < .01\)) and peer rejection at Wave 3 (\(B = -1.63, SE_B = .80, p < .05\)). As stated previously, peer rejection at Wave 3 was significantly associated with depressive symptoms at Wave 4 (\(B = .43, SE_B = .16, p < .01\)). Results indicated that peer rejection at Wave 3 partially mediated the relationship between social support at Wave 1 and depressive symptoms at Wave 4 (\(B = .16, SE_B = .05, p < .05\)). The indirect effect of social support at Wave 1 on depressive symptoms at Wave 4 through peer rejection at Wave 3 approached significance (\(Z = -1.81, p = .07\)). Nonetheless, social support at Wave 1 was significantly associated with peer rejection at Wave 3, which in turn was marginally associated with depressive symptoms at Wave 4. It is important to note that after accounting for initial levels of depressive symptoms, this effect was no longer observed.

**Examination of the Hypothesized Model with Substance Use as an Outcome**

Results of the hypothesized model with substance use at Wave 4 as an outcome are presented in Figure 2b. Estimation of the hypothesized model for the entire sample showed acceptable levels of fit when examining substance use at Wave 4 (RMSEA = .06, CFI = .90, TLI = .90). Examining the total effects of socioenvironmental risk at Wave 1, social
support at Wave 1, peer rejection at Wave 3, and substance use at Wave 4, no socioenvironmental risk by social support interaction existed after controlling for initial levels of substance use ($B = .06$, $SE_B = .04$, $p = .25$) that is, the indirect effect of socioenvironmental risk at Wave 1 on substance use at Wave 4 through peer rejection at Wave 3 did not vary as a function of social support at Wave 1. The entire model accounted for approximately 14% of the variance in substance use at Wave 4, with substance use at Wave 1 accounting for approximately 9% of the variance in substance use at Wave 4.

Removing the interaction term, tests for mediation were conducted separately with socioenvironmental risk at Wave 1 and social support at Wave 1 as predictors. Mediation was not pursued with socioenvironmental risk at Wave 1 due to a non-significant association between socioenvironmental risk at Wave 1 and peer rejection at Wave 3 ($B = 1.11$, $SE_B = .61$, $p = .07$) and no relationship between peer rejection at Wave 3 and substance use at Wave 4 ($B = .13$, $SE_B = .16$, $p = .42$). While mediation was not pursued with socioenvironmental risk at Wave 1 as a predictor, socioenvironmental risk at Wave 1 was significantly associated with substance use at Wave 4 ($B = .65$, $SE_B = .31$, $p < .05$). However, this path was no longer significant after accounting for initial levels of substance use.

Social support at Wave 1 was not significantly associated with substance use at Wave 4 ($B = .31$, $SE_B = .41$, $p = .45$). As there was no observed relationship between social support at Wave 1 and substance use at Wave 4, mediation was not examined in further detail. As stated previously, social support at Wave 1 was significantly associated with peer rejection at Wave 3 ($B = -1.63$, $SE_B = .80$, $p < .05$) and this relationship
remained significant after accounting for initial levels of substance use ($B = -1.60, SE_B = .82, p < .05$). No additional paths were found to be significant after controlling for initial levels of substance use.

**Examination of the Hypothesized Model with Involvement in Delinquent Acts as an Outcome**

Results of the hypothesized model with involvement in delinquent acts at Wave 4 as an outcome are presented in Figure 2c. Estimation of the hypothesized model for the entire sample showed a poorer model fit when examining involvement in delinquent acts at Wave 4 (RMSEA = .07, CFI = .89, TLI = .89). Examination of the modification indices did not suggest that the model may be revised to improve model fit. Examining the total effects of socioenvironmental risk at Wave 1, social support at Wave 1, peer rejection at Wave 3, and involvement in delinquent acts at Wave 4, no socioenvironmental risk by social support interaction existed ($B = .09, SE_B = .05, p = .21$); that is, the indirect effect of socioenvironmental risk at Wave 1 on involvement in delinquent acts at Wave 4 through peer rejection at Wave 3 did not vary as a function of social support at Wave 1. The entire model accounted for approximately 17% of the variance in delinquency at Wave 4, with delinquency at Wave 1 accounting for approximately 11% of the variance in delinquency at Wave 4.

Removing the interaction term, tests for mediation were conducted separately with socioenvironmental risk at Wave 1 and social support at Wave 1 as predictors. As stated previously, mediation was not pursued with socioenvironmental risk at Wave 1 due to a non-significant association between socioenvironmental risk at Wave 1 and peer rejection at Wave 3 ($B = 1.11, SE_B = .61, p = .07$). It is important to note that peer rejection at Wave
3 was significantly associated with involvement in delinquent acts at Wave 4 ($B = .03, SE_B = .01, p < .05$) and that this relationship remained significant after accounting for initial levels of involvement in delinquent acts ($B = .03, SE_B = .01, p < .05$).

Social support at Wave 1 was marginally associated with involvement in delinquent acts at Wave 4 ($B = -.31, SE_B = .18, p = .06$). As stated previously, social support at Wave 1 was significantly associated with peer rejection at Wave 3 ($B = -1.63, SE_B = .80, p < .05$) and social support at Wave 1 was marginally associated with involvement in delinquent acts at Wave 4 after accounting for initial levels of involvement in delinquent acts ($B = -1.57, SE_B = .81, p = .09$). No additional paths were found to be significant after controlling for initial levels of involvement in delinquent acts.

**Post-Hoc Analyses**

There is research to suggest that there may be a trigger point in which the risk for developing maladjustment is significantly higher (Garmezy, 1983; Rutter, 1979). For instance, a number of researchers have found that youth with three or less risk factors are not at risk for negative outcomes and that the “tipping point” was having four or more risk factors (Dube et al., 2003; Kilpatrick et al., 2000; Garmezy, 1983). Regression analyses were conducted for sexually maltreated youth with four or more risk factors (70 participants) to determine whether a stronger association existed for those with four or more risk factors. Socioenvironmental risk at Wave 1 was marginally associated with depressive symptoms at Wave 4 ($B = .13, SE_B = .11, p = .09$). Socioenvironmental risk at Wave 1 was not associated with either substance use at Wave 4 ($B = 1.06, SE_B = .82, p = .11$) or involvement in delinquent acts at Wave 4 ($B = .44, SE_B = .12, p = .12$). In addition, social support at Wave 1 was not associated with depressive symptoms at Wave 4 ($B = -
1.50, $SE_B = .63, p = .11$), substance use at Wave 4 ($B = -.14, SE_B = .11, p = .31$), and involvement in delinquent acts at Wave 4 ($B = -.57, SE_B = .45, p = .22$).

Because there is evidence to suggest that social support may function as a mediator (Pepin & Banyard, 2006; Seeds et al., 2010), the indirect influence of socioenvironmental risk at Wave 1 on mental health outcomes at Wave 4 (e.g. depressive symptoms, substance use, involvement in delinquent acts) through social support at Wave 1 was examined. Socioenvironmental risk at Wave 1 was not associated with social support at Wave 1 ($B = .04, SE_B = .05, p = .36$); as such, examination of the possibility of mediation was not pursued with depressive symptoms, substance use, and involvement in delinquent acts at Wave 4 as outcomes.

Due to an interest in examining the hypothesized model among females alone, separate analyses were conducted excluding males. Due to excluding males from analyses, power was reduced considerably (power = .69) in comparison to examining males and females together. Analyses in the present study were limited to 203 females without any missing values on the predictor variables. Examining the total effects of socioenvironmental risk at Wave 1, social support at Wave 1, peer rejection at Wave 3, and mental health outcomes at Wave 4, it was found that no socioenvironmental risk by social support interaction existed for depressive symptoms ($B = .10, SE_B = .07, \beta = .13, p = .18$), substance use ($B = .03, SE_B = .01, \beta = .10, p = .21$) and involvement in delinquent acts ($B = .02, SE_B = .01, \beta = .11, p = .20$).

Removing the interaction term, tests for mediation were conducted separately for each hypothesized model among females. Socioenvironmental risk at Wave 1 was not significantly associated with substance use at Wave 4 after accounting for initial levels of
substance use ($B = .33, SE_B = .01, p = .07$) and involvement in delinquent acts at Wave 4 after accounting for initial levels of involvement in delinquent acts ($B = .23, SE_B = .15, p = .12$); consequently, examination of the possibility of mediation was not pursued in further detail. Results indicated that peer rejection at Wave 3 fully mediated the relationship between socioenvironmental risk at Wave 1 and depressive symptoms at Wave 4 ($B = .88, SE_B = .50, p = .08$). The indirect effect of socioenvironmental risk at Wave 1 on depressive symptoms at Wave 4 through peer rejection at Wave 3 was significant ($Z = 2.04, p = .04$); socioenvironmental risk at Wave 1 was significantly associated with peer rejection at Wave 3, which in turn was significantly associated with depressive symptoms at Wave 4. These results are in contrast to results obtained when examining the hypothesized model with depressive symptoms as an outcome at Wave 4 in males and females, in which socioenvironmental risk at Wave 1 was not significantly associated with peer rejection at Wave 3. It is important to note that after controlling for initial levels of depressive symptoms, peer rejection at Wave 3 no longer mediated the relationship between socioenvironmental risk at Wave 1 and depressive symptoms at Wave 4 ($B = .08, SE_B = .06, p = .13$).
Chapter IV: Discussion

The present study sought to examine a model in which perceived social support was expected to moderate socioenvironmental risk, such that socioenvironmental risk would be less strongly associated with later reports of depressive symptoms, substance use, and involvement in delinquent acts; it was expected that this relationship would differ for sexually maltreated youth with high levels of social support compared to those with low levels of social support. In addition, it was hypothesized that social support would buffer against the negative influences of socioenvironmental risk on mental health outcomes and that this relationship would be less significant when peer rejection is taken into consideration. While the overall model was not supported with regards to the outcomes examined in the present study (e.g. depressive symptoms, substance use, involvement in delinquent acts), support was obtained for specific pathways.

The hypothesis that greater levels of socioenvironmental risk would be associated with various mental health outcomes was supported for depressive symptoms and substance use. Sexually maltreated youth exposed to greater levels of socioenvironmental risk were more likely to report higher levels of depressive symptoms and substance use at a later time point. This finding is consistent with findings of previous research that found a link between socioenvironmental risk and maladjustment (Auerbach et al., 2010; Dube et al., 2003; Gabalda et al., 2010; Roberts et al., 2009). For instance, Raviv and colleagues (2010) found that maltreated youth with multiple risks were more likely to report experiencing symptoms associated with anxiety and depression and that symptom levels increased with an increase in the number of risk factors. Similarly, Dube and colleagues (2003) found that youth were more likely to report illicit substance use as the number of
risk factors increased. The results of previous studies and the present study provide support for the cumulative risk perspective (Garmezy, 1983; Rutter, 1979). The cumulative risk perspective allows for the simultaneous examination of co-occurring risks, and numerous studies have shown that multiple risk factors are a better predictor of developmental outcomes than any single risk factor (Appleyard et al., 2005; Deater-Deckard et al., 1998; Fergusson & Horwood, 2003; Gutman, Sameroff, & Cole, 2003). In the present study, it is likely that an accumulation of socioenvironmental risks is experienced as stressors among sexually maltreated youth transitioning to adolescence. Sexually maltreated youth experiencing multiple risks may be more likely to develop depressive symptoms and to use substances in comparison to sexually maltreated youth with no socioenvironmental risks. Consequently, an emphasis on multiple risks may better reflect the realities faced by sexually maltreated youth and their families.

Contrary to expectations, socioenvironmental risk at Wave 1 was not associated with involvement in delinquent acts at Wave 4. Moreover, the hypothesized model with involvement in delinquent acts as an outcome was largely unsupported, with the exception of the path between peer rejection at Wave 3 and involvement in delinquent acts at Wave 4. In the present study, sexually maltreated youth reported engaging in delinquent acts at a relatively low rate. This finding has been documented less frequently among youth with a history of sexual abuse (Goodkind, Ng, & Sarri, 2006; Smith, Ireland, & Thornberry, 2005), and research has linked physical abuse to involvement in delinquent acts more consistently (Fagan, 2005; Ford, Elhai, Connor, & Frueh, 2010; Widom & Maxfield, 1996). For instance, Smith and colleagues (2005) found that adolescents that were sexually
abused were not at increased risk for involvement in delinquent acts during late adolescence in comparison to those who were physically abused.

In understanding why the hypothesized model was unsupported with involvement in delinquent acts as an outcome, it is important to consider the higher proportion of females to males that are typically reported in prevalence rates of sexual abuse. Studies have often found a larger percentage of females to be victims of sexual abuse in comparison to males (Dube et al., 2005). For instance, prevalence rates have indicated that approximately 12 to 40 percent of females and approximately 4 to 17 percent of males in the United States have experienced at least one episode of sexual abuse in childhood and adolescence (Finkelhor, 2009). The number of males and females participating in the present study is consistent with what has been reported in previous studies, which included a subsample of males that was significantly lower than females (e.g. 57 males in comparison to 212 females). Given that males are historically more likely to display externalizing symptoms in comparison to females (Yates, Dodds, Sroufe, & Egeland, 2003; Zahn-Waxler, Shirtcliff, & Marceau, 2008), it is possible that the hypothesized model with involvement in delinquent acts may be supported with a larger sample of males for which there are a wider range of responses. While there was insufficient power to conduct separate analyses for males, future researchers may be interested in determining whether such a relationship exists with regards to involvement in delinquent acts among sexually maltreated males.

In addition to a lack of support for the hypothesized model with involvement in delinquent acts as an outcome, the hypothesized model was unsupported with substance use as an outcome. Contrary to expectations, social support did not buffer against the
indirect effects of socioenvironmental risk on substance use through peer rejection. This finding is surprising given that socioenvironmental risk has been associated with substance use among youth in the general population (Ostaszewski & Zimmerman, 2006; Randolph, 2004; Spoth, Goldberg, Neppl, Trudeau, & Ramisetty-Mikler, 2001). However, reports of substance use among youth involved with child welfare services have varied depending on the sample examined and how substance use is assessed (Johnston, 2007; Traube, James, Zhang, & Landsverk, 2012; Wall & Kohl, 2007). Using the NSCAW dataset, Wall & Kohl (2007) found that approximately 71% of maltreated youth (e.g. physical abuse, sexual abuse, neglect) in their study reported no substance use, approximately 20% of youth reported low levels of substance use, and approximately 9% of youth reported moderate to high levels of substance use. Other regional studies have reported that approximately 50% of adolescents that were either physically, sexually, or emotionally abused reported alcohol use (Moran, Vuchinich, & Hall, 2004). Sexually maltreated youth in the present study reported using three substances at rates that are comparable to the general population, alcohol, cigarettes, and marijuana. For example, reports of using marijuana in the present study (38.3%) are equivalent to reports of using marijuana in the general population (38.9%; Youth Risk Behavior Surveillance, 2011). A higher percentage of youth in the general population reported using alcohol (70.8%; Youth Risk Behavior Surveillance, 2011) in comparison to youth in the present study (56.1%) while a higher percentage of youth in the present study reported smoking cigarettes (57.6%) in comparison to the general population (44.7%; Youth Risk Behaviors Surveillance, 2011). Results obtained from the present study may inform researchers about substances that are more likely to be used among sexually maltreated youth transitioning to adolescence.
The higher levels of substance use for particular substances (e.g. cigarettes), as reported by youth in the present study, are expected for a sample that has experienced significant adversity (Kilpatrick et al., 2000). However, there appear to be inconsistencies in youth’s report of substance use from the initial wave of data collection to the fourth wave of data collection, and these inconsistencies may not be reflective of actual substance use in this particular sample. Notably, there appears to be a decrease in the number of youth reporting that they have used certain substances at Wave 3 in comparison to Wave 1. If youth are accurately reporting upon their substance use in the present study, one would expect the number of youth reporting substance use to either remain the same or to increase over time. Inconsistencies in youth report of substance use over time may result for a variety of reasons, including lying, errors in recall, or random errors (Siddiqui, Mott, Anderson, & Flay, 1999). For instance, adolescent substance use that is based on self-report may be underreported if youth are concerned that others will disapprove of their behaviors if they answer truthfully. It is equally plausible that there are uncertainties regarding what constitutes substance use (Young, Boles, & Cotero, 2007). Youth that have used substances once or twice may not consider themselves to be users, and this may be reflected in their responses. Indeed, substance use is commonplace in adolescence (Williams, Holmbeck, & Greenley, 2002) and research has suggested that many adolescents do not perceive their substance use to be problematic (Zamboanga, Schwartz, Ham, Jarvis, & Olthuis, 2009). It is possible that youth do not perceive any problems regarding their substance use and this may be reflected in their responses. Moreover, the measure used to examine substance use in the present study, the Drug Free School Community Act outcome questions, inquires about current and lifetime substance use and
does not tap into facets of substance use that may be beneficial in understanding what leads youth to use substances. For instance, examining factors associated with availability and accessibility, as well as youth perception of substance use, may be beneficial in understanding why particular substances are preferred in sexually maltreated youth.

Contrary to expectations, the path between socioenvironmental risk at Wave 1 and peer rejection at Wave 3 was unsupported when males and females were examined together. This finding is inconsistent with research highlighting the detrimental impact of cumulative risk on peer rejection (Gaylord, Kitzmann, & Lockwood, 2003; Gerard & Buehler, 2004). Several explanations may provide clarity as to why this finding was not obtained in the present study. Symptoms of psychopathology, such as depressive symptoms, may undermine the formation of meaningful relationships, which subsequently may influence the extent to which youth perceive themselves to be rejected by peers (Masten, 2006; Sameroff, 2000). For instance, in the present study depressive symptoms at Wave 1 were significantly associated with peer rejection at Wave 3, suggesting that youth reporting depressive symptoms at Wave 1 were more likely to report higher levels of peer rejection at Wave 3. Research has shown that maltreated youth that report experiencing depressive symptoms are often withdrawn from others in social settings, such as school (Bolger, Patterson, & Kupersmidt, 1998; Elliott, Cunningham, Linder, Colangelo, & Gross, 2005). It is important to consider the possibility that baseline levels of symptomatology (e.g. depressive symptoms) may be more strongly related to later reports of peer rejection, rather than exposure to socioenvironmental risks within maltreated youth’s environments.
A second possibility for the lack of association between socioenvironmental risk and peer rejection in the present study involves the use of different sources of information and how this may have influenced results. Items comprising the socioenvironmental risk composite in the present study were derived from caseworkers’ evaluations of youth’s environments. While it is a methodological strength to include multiple sources of information, it is equally plausible that caseworkers’ reports do not accurately reflect the circumstances with which youth are confronted in their environments (Dorsey, Mustillo, Farmer, & Elbogen, 2008). For instance, Dorsey and colleagues (2008) found that caseworkers’ responses were associated with a limited number of identified risk factors in the NSCAW dataset. The authors asserted that the overall findings of their study suggest a multifaceted depiction of risk assessment in which there were few risk factors that were associated with caseworker classification of risk and various outcomes (e.g. subsequent reports of maltreatment). The findings of the present study are inconsistent with studies that have identified risk factors to be associated with peer rejection among maltreated youth (Gaylord et al., 2003; Gerard & Buehler, 2004). For instance, Gerard & Buehler (2004) found that cumulative environmental risk, which was comprised of both parent and youth responses, was significantly associated with difficulties in peer relations in a sample of inner-city youth, with youth reporting more difficulties with peer acceptance. The authors’ findings suggest that childhood sexual abuse occurs within the context of adverse experiences and that these factors are associated with peer rejection.

While previous research has identified a relationship between socioenvironmental risk and peer rejection, it is important to consider that perhaps there is no relationship between socioenvironmental risk and peer rejection in this particular sample of youth.
Research has indicated that sexually maltreated youth may not necessarily exhibit difficulties with regards to peer interactions (Bolger & Patterson, 1998). In their examination of peer relationships and self-esteem among children who have been maltreated, Bolger and Patterson (1998) found that sexual abuse was predictive of low self-esteem but not difficulties in peer relationships. The authors concluded that the type of abuse that has been experienced is likely to influence the extent to which youth experienced difficulties within peer interactions. For instance, physical abuse has been consistently shown to be associated with an interest in gaining compliance in peer relations rather than developing a reciprocal, mutually satisfying relationship (Hart, Ladd, & Burleson, 1990). In contrast, an emphasis is typically placed on peer interactions that receive immediate attention among sexually maltreated youth, including inappropriate sexual behaviors or acting out in social and interpersonal situations (Pithers, Gray, Busconi, & Houchens, 1998). Consequently, any peer difficulties that are less severe may go undetected over an extended period of time for sexually maltreated youth as they may not necessarily exhibit changes when interacting with peers.

Though not a primary objective of the present study, socioenvironmental risk at Wave 1 was significantly associated with peer rejection at Wave 3 among females, a finding that was not observed when males and females were examined together. In addition, depressive symptoms at Wave 1 were significantly associated with depressive symptoms at Wave 4 among females. This finding is consistent with observed means differences in depressive symptoms between males and females in the present study and is not surprising, given that females are more likely than males to experience internalizing problems during adolescence (Crawford, Cohen, Midlarsky, & Brook, 2001). However,
while depressive symptoms at Wave 1 were significantly associated with depressive symptoms at Wave 4, the average level of symptoms was not at the clinical cutoff for the CDI. Indeed, rates of depressive symptoms decreased over time in the present study, with a three-point decrease in depressive symptoms between Wave 1 and Wave 4; reports of depressive symptoms were highest at Wave 1. This finding is unexpected, given that research has shown that sexually maltreated youth are at increased risk for experiencing depressive symptoms (Feiring et al., 1998; Ferguson et al., 2008; Kendler, Kuhn, & Prescott, 2004; Mendelson et al., 2010; Weiss et al., 1999). It is possible that initial incidents proximal to reports placed at local child protective service agencies resulted in a temporary increase in depressive symptoms among females and that symptoms gradually decreased over time. In a study examining longitudinal trajectories of depressive symptoms in maltreated and non-maltreated children, Kim and Cicchetti (2006) found that sexual abuse was not a significant predictor of the growth factor of depressive symptoms and that depressive symptoms decreased over a four-year period. It is also important to consider the potential impact of testing/practice effects due to habituation among youth in the present study. In a meta-analysis of the Children’s Depression Inventory, Twenge and Nolen-Hoeksema (2002) compared the third wave of studies with a six-month time lag to the second wave of studies with a one-year time lag (e.g. the CDI was re-administered approximately six months or one year after it was initially administered but was either the second or third time that participants completed it) and found scores of third-wave respondents to be lower than second-wave respondents. The authors concluded that the number of times that respondents completed the CDI appeared to be a critical factor in how items were endorsed. It is plausible that youth in the present study became familiar
with items on the CDI and responded in a manner that do not accurately reflect depressive symptoms.

Social support did not buffer against the negative impact of socioenvironmental risk on later reports of depressive symptoms, substance use, and involvement in delinquent acts. Findings on the buffering effect of social support have been inconsistent with some researchers finding support for the buffering effect (Eisenberg et al., 2007; Holt & Espelage, 2005; Jaffee et al., 2007; Saewyc & Edinburgh, 2010; Salazar et al., 2011) and others failing to find a buffering effect (Bal et al., 2003; Josephs, Williams, & Yule, 1997). For example, Bal and colleagues (2003) found that social support did not moderate the relationship between stressful events and ability to cope. Sexually abused adolescents reported greater levels of depressive symptoms and were less likely to seek support from individuals in comparison to adolescents exposed to other stressors (e.g. being attacked, exposed to community violence). The authors concluded that sexual abuse may be associated with an increased vulnerability to identify individuals perceived to be trustworthy and to form meaningful relationships with them.

While social support was posited to have a buffering influence on various mental health outcomes in the present study, it is possible that social support functioned as a mediator for youth with either alleged or substantiated cases of sexual maltreatment. Post-hoc analyses were conducted in which social support was examined as a mediator between socioenvironmental risk and later reports of depressive symptoms, substance use, and involvement in delinquent acts; however, the mediating influence of social support was not examined due to a lack of association between socioenvironmental risk at Wave 1 and social support at Wave 1. There may be specific details surrounding the abuse that were
not available in the present study but that may be relevant in exploring why social support did not exert any positive effects. For instance, it is important to consider the age at which the sexual abuse occurs and how this may contribute to the availability of social support, the choice of primary support, and subsequent responses in relation to the abuse (Meyerson, Long, Miranda Jr., Marx, 2002). Sexually maltreated youth may be less likely to seek out the support of a parent or caregiver if the perpetrator was a family relative. In addition, it is important to consider the availability and accessibility of social support networks to sexually maltreated youth in the present study. Families that are confronted with multiple stressors, in addition to having a child that has been sexually maltreated, may not necessarily have or be aware of social supports available to them within their communities.

Overall, adolescent levels of functioning in the emotional and behavioral domains examined in the present study are comparable to levels obtained in the general population. The results of this study also suggest that participants appear to be doing fairly well despite exposure to adversity. The high levels of socioemotional functioning, per participants’ report, are in contrast to what has been obtained in previous studies. A number of researchers have reported higher percentages of maltreated youth with internalizing and externalizing symptoms in the clinically significant range (Cicchetti & Toth, 2000; Sternberg, Lamb, Guterman, & Abbott, 2006). For instance, Yancey and colleagues (2002) found that sexually abused adolescents reported experiencing clinical levels of depressive symptoms, as measured by the CDI, in comparison to adolescents that were not sexually abused. One possible explanation why sexually maltreated youth in the present study are doing well may be due to receiving treatment to address symptoms.
Indeed, approximately half of the youth in the present study reported participating in outpatient treatment services within the last year. Research has shown an association between treatment participation and psychological adjustment among sexually maltreated youth (Cohen, Deblinger, Mannarino, & Steer, 2004; Cohen, Mannarino, & Knudsen, 2005; Sawyer, 2007; Saywitz et al., 2000). In a study examining responses to two alternative treatments for sexually abused children, Cohen and colleagues (2005) identified trauma-focused cognitive behavioral therapy as being superior to a supportive therapeutic approach in decreasing symptoms related to depression, posttraumatic stress, and anxiety. Moreover, these effects were maintained at a one-year follow-up period. The results of this study provide support for the utility of treatments in decreasing symptoms and improving functioning in sexually maltreated youth.

While the results of the present study may accurately reflect psychological functioning, several cautions are warranted. Specifically, the composition of the sample examined in the present study differs from the composition of samples examined in previous studies. Researchers have typically examined functioning in youth with substantiated cases of maltreatment (Kaplow & Widom, 2007; Sprang, Clark, & Bass, 2005; Wekerle, Wall, Leung, Trocme, 2007). In contrast, NSCAW was designed to examine functioning in children referred to child protective service agencies, regardless of whether reports were substantiated or unsubstantiated. The majority of cases for whom referrals were made to child protective service agencies in the present study were not substantiated. In addition, it is unclear whether participants in the present study experienced one episode of sexual abuse or whether this abuse occurred multiple times; as such, it is unclear whether this information may be associated with lack of support for the
hypothesized models in the present study. Moreover, it is important to note that many children and their families from whom data were obtained were the subject of current investigations with their local child protective service agencies, and the extent to which this may have influenced reports of children’s functioning is unclear. For instance, it is possible that participants and their families in the present study did not provide accurate information due to concerns that youth will be removed from the home if information surrounding the abuse is shared.

Given that sexually maltreated youth in the present study do not, on average, meet clinical thresholds when they reported upon their symptoms, it is important to consider whether there are possible “sleeper effects” operating within this particular sample. Sleeper effects refer to the absence of symptoms in victims of sexual abuse (Finkelhor & Berliner, 1995; Putnam, 2003). According to this perspective, symptoms or reactions to sexual abuse may not become apparent until many years have elapsed from disclosure of the abuse (Briere, 1992). A number of studies have provided support for the sleeper effect in sexually maltreated youth, with research showing that sexually maltreated youth that initially display few symptoms deteriorate in functioning over time (Feiring et al., 1996; Noll et al., 2006; McCrae, Chapman, & Christ, 2006; Saywitz, Mannarino, Berliner, & Cohen, 2000). While the sleeper effect has been raised as a possibility for why sexually maltreated youth initially present as asymptomatic, there have been fewer longitudinal studies examining the influence of sleeper effects over an extended period of time (Chu & DePrince, 2006; Noll et al., 2006). It is possible that there are sleeper effects that may manifest in this sample of youth, especially as they continue to transition to adolescence and young adulthood.
Limitations

The results of the present study should be interpreted with caution and viewed in light of their limitations. While NSCAW is representative of youth residing in neighborhoods throughout the United States, sample size constraints did not allow for examination of the model according to race and ethnicity. Consequently, it is unclear whether findings are generalizable to youth of a particular ethnic background (e.g., Latino, African American) or youth of different ethnic backgrounds that were not examined in NSCAW. The cultures in which children of different races and ethnicities are raised may result in diverse understandings of sexual abuse experiences, and the balance of risk and protective factors that characterize sexually maltreated males and females may function differently depending upon race and ethnicity. In addition, the results may not generalize to sexually maltreated youth residing in diverse settings and from different socioeconomic backgrounds (e.g., upper middle class). The findings of the present study may be confirmed, or refuted, through further examination of the model with a larger sample size that includes a fairly equal distribution across ethnicity and gender. Second, the present study was constrained by the limited number of behavioral and mental health constructs in NSCAW (e.g., questions related to perpetrator of sexual abuse resulting in referral to CPS agency). Variables of interest that may have been helpful in enhancing our understanding of the relationship between socioenvironmental risk and social support and various mental health outcomes (e.g., depressive symptomatology, substance use, involvement in delinquent acts) were not available to examine in the present study. It is possible that there are unstudied factors that may have been beneficial in understanding why sexually maltreated youth in the present study fared better than would be the case in a higher
adversity or lower functioning sample. In addition, specific information related to severity of abuse and perpetrator status was unavailable in the present study thus limiting generalizations that may be made from the present sample to the general population. It is important to consider that the limited information obtained with regards to the individual responsible for the abuse may be difficult for respondents, as they are directly confronted with providing information about who may have been responsible for the abuse. In addition, research has shown that peer influences become increasingly salient among youth transitioning to adolescence (Collins & Madsen, 2006; Wolfe et al., 1998). Given the importance of peer relations in adolescence, obtaining additional information about positive peer influences may be beneficial in determining the potential role of peers in buffering against poor outcomes among sexually maltreated youth. Third, self-report measures were used to examine the constructs in the present study, and it is possible that the use of self-report measures could have resulted in biased reporting. Lastly, caution is warranted in making causal interpretations from the present findings. As the hypothesized model was unsupported, it is possible that the variables examined in the present study operated in a manner that differed from what was originally posited. For instance, it is possible that sexually maltreated youth that use substances are more likely to be rejected thus potentially increasing the risk that their environment poses to them (e.g., seeking out substances in environments that are unsafe), rather than increased socioenvironmental risk and peer rejection leading to substance use. While the present study utilized a longitudinal design, the manner in which these variables relate to one another should be examined in further detail in future studies.
Clinical Implications and Directions for Future Research

Despite the limitations, the present study adds to a growing area of literature emphasizing mental health outcomes in a sample of sexually maltreated youth. The present findings suggest that participating in treatment may be beneficial in decreasing symptoms among sexually maltreated youth. Research has suggested that trauma-focused cognitive therapy is the “gold standard” for addressing symptoms associated with maltreatment (Cohen et al., 2004; Nolan, Carr, Fitzpatrick, O’Flaherty, Keary, Turner, et al., 2002). It is important for individuals working with sexually maltreated youth and their families to consider the influence of multiple risks present within youth environments rather than examining individual risk factors in isolation. In doing this, it is important to consider the relation of symptoms to stressors associated with sexual abuse and to ongoing issues in youth’s environments that may either exacerbate or ameliorate symptoms; this supports the idea of services that are abuse-informed but not exclusively abuse-informed (Saunders et al., 2001). It may be beneficial for researchers to continue examining how socioenvironmental risks relate to heterogeneity in peer relations, including the formation of healthy peer relationships and rejection from peers. Examination of the relationship between socioenvironmental risk and peer rejection contemporaneously and longitudinally may provide information about how socioenvironmental risk may be related to peer rejection both concurrently and as sexually maltreated youth become older. Interventions designed to improve peer relations may be beneficial in decreasing internalizing and externalizing symptoms and improving overall quality of life.

When examining the stability of symptoms over time, it is important to consider how the occurrence of sexual abuse proximal to developmental and proximal changes
associated with adolescence may contribute to this stability. Acute responses to traumatic events, such as sexual abuse, may be confused for coinciding changes associated with puberty (Noll, Trickett, Susman, & Putnam, 2006; Trickett, Noll, & Putnam, 2011). Particularly for females, where there is a two-fold increase in depressive symptoms associated with adolescence (Wade, Cairney, & Pevalin, 2002), it is important to maintain an awareness of how distinguishing symptoms associated with puberty from symptoms associated with trauma may inform treatment. Early and accurate identification of symptoms may be helpful in providing treatment that is appropriate for sexually maltreated youth and their families.

Moreover, parents and caretakers of children that have been sexually abused may benefit from receiving support with regards to increasing their communication with their children about sensitive topics (e.g. forming intimate relationships with others, stressors associated with abuse). As research has suggested that adolescents perceive the family structure as most important with regards to providing support (Hart, Hodgkinson, Belcher, Hyman, & Cooley-Strickland, 2012), intervention efforts should place an emphasis on increasing parents’ and caregivers’ confidence as reliable sources of support (Stagner & Lansing, 2009). Given the complex stressors that sexually maltreated youth and their families confront on a regular basis, a wraparound approach that is family-centered and encourages cross-collaboration among agencies may be best suited to appropriately address families’ needs. It is important for mental health professionals to be aware of the unique needs of sexually maltreated youth and their families and to facilitate communication with agencies of care to ensure that they are receiving care that is appropriate to their level of need. Furthermore, clinicians treating families in which a child
transitioning to adolescence has been sexually maltreated may help clients by identifying sources of social support, either within the family structure or in the community (e.g. school, community center). Helping to increase awareness of social supports available to sexually maltreated youth may effectively reduce perceived peer rejection as well as levels of depressive symptoms, substance use, and involvement in delinquent acts. Lastly, the results of the present study suggest that sexual abuse is not necessarily predictive of adjustment difficulties. As such, it is important for practitioners to adequately assess youth that have been sexually maltreated and to recognize factors that may facilitate positive outcomes.

Conclusion

Although many sexually maltreated youth will continue to experience difficulties across domains, efforts will continue to bring awareness to social and mental health consequences observed among youth that have been sexually maltreated. Therefore, it is essential for schools and programs to provide information about support networks readily available to sexually maltreated youth and their families. Additional studies are warranted, particularly among sexually maltreated youth from ethnically diverse backgrounds, in order to continue identifying characteristics associated with the environments of sexually maltreated youth and mechanisms through which sexually maltreated youth develop internalizing and externalizing symptoms. In addition, future studies should also continue examining how sexually maltreated youth transitioning to adolescence simultaneously handle the developmental changes associated with puberty and the unique stressors associated with their abuse. While the findings of the present study are preliminary in
nature, it is the hope that these findings will provide a stepping stone from which future researchers will be able to build upon and expand.
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abuse and neglect and illicit drug use in middle adulthood: The potential mediating


Appendix

The Loneliness and Social Dissatisfaction Scale (Asher, Hymel, & Renshaw, 1984; Asher & Wheeler, 1985)

Responses: 1 Never
2 Hardly ever
3 Sometimes
4 Most of the time
5 Always

How often is this true about you?

1. It’s easy for me to make new friends at school.
2. I have nobody to talk to at school.
3. I’m good at working with other kids at school.
4. It’s hard for me to make friends at school.
5. I have lots of friends at school.
6. I feel alone at school.
7. I can find a friend when I need one.
8. It’s hard to get kids in school to like me.
9. I don’t have anyone to play with at school.
10. I get along with other kids at school.
11. I feel left out of things at school.
12. There are no kids at school that I can go to when I need help.
13. I don’t get along with other kids at school.
15. I am well liked by the kids at school
16. I don’t have any friends at school.

The Drug Free School Community Act outcome questions (Drug Free School Community Act, 1986)

1. In your whole life, on how many days did you drink an alcoholic beverage including beer, wine, wine coolers, and liquor? Please do not include any sips you may have had from another person's drink.

   1 1 day
   2 2 days
   3 3 to 5 days
   4 6 to 11 days
   5 12 to 19 days
   6 20 days or more
   8 I have never done this
2. In the last 30 days, on how many days did you drink an alcoholic beverage?
   1  1 day
   2  2 days
   3  3 to 5 days (about 1 day a week)
   4  6 to 11 days (about 2 days a week)
   5  12 to 19 days (about 3 or 4 days a week)
   6  20 days or more (5 days a week or more)
   8  I have not done this in the past 30 days

3. In your whole life, on how many days have you smoked a cigarette?
   1  1 day
   2  2 days
   3  3 to 5 days
   4  6 to 11 days
   5  12 to 19 days
   6  20 days or more
   8  I have never done this

4. In the last 30 days, on how many days did you smoke a cigarette?
   1  1 day
   2  2 days
   3  3 to 5 days (about 1 day a week)
   4  6 to 11 days (about 2 days a week)
   5  12 to 19 days (about 3 or 4 days a week)
   6  20 days or more (5 days a week or more)
   8  I have not done this in the past 30 days

5. In your whole life, on how many days have you used chewing tobacco or snuff?
   1  1 day
   2  2 days
   3  3 to 5 days
   4  6 to 11 days
   5  12 to 19 days
   6  20 days or more
   8  I have never done this
6. In the last 30 days, on how many days did you use chewing tobacco or snuff?

1  1 day
2  2 days
3  3 to 5 days (about 1 day a week)
4  6 to 11 days (about 2 days a week)
5  12 to 19 days (about 3 or 4 days a week)
6  20 days or more (5 days a week or more)
8  I have not done this in the past 30 days

7. In your whole life, on how many days have you used marijuana (pot, grass) or hashish (hash)?

1  1 day
2  2 days
3  3 to 5 days
4  6 to 11 days
5  12 to 19 days
6  20 days or more
8  I have never done this

8. In the last 30 days, on how many days did you use marijuana or hashish?

1  1 day
2  2 days
3  3 to 5 days (about 1 day a week)
4  6 to 11 days (about 2 days a week)
5  12 to 19 days (about 3 or 4 days a week)
6  20 days or more (5 days a week or more)
8  I have not done this in the past 30 days

9. In your whole life, on how many days have you sniffed glue, gasoline or other liquids and gases to get high?

1  1 day
2  2 days
3  3 to 5 days
4  6 to 11 days
5  12 to 19 days
6  20 days or more
8  I have never done this
10. In the last 30 days, on how many days did you sniff glue, gasoline or other liquids and gases to get high?

1 1 day
2 2 days
3 3 to 5 days (about 1 day a week)
4 6 to 11 days (about 2 days a week)
5 12 to 19 days (about 3 or 4 days a week)
6 20 days or more (5 days a week or more)
8 I have not done this in the past 30 days

11. In your whole life, on how many days have you used hard drugs such as cocaine, crack, or heroin?

1 1 day
2 2 days
3 3 to 5 days
4 6 to 11 days
5 12 to 19 days
6 20 days or more
8 I have never done this

12. In the last 30 days, on how many days did you use hard drugs such as cocaine, crack, or heroin?

1 1 day
2 2 days
3 3 to 5 days (about 1 day a week)
4 6 to 11 days (about 2 days a week)
5 12 to 19 days (about 3 or 4 days a week)
6 20 days or more (5 days a week or more)
8 I have not done this in the past 30 days
13. Sometimes people take prescription drugs and medicines that were not prescribed by a doctor for them, or because they are interested in the experience or feeling these drugs cause. The types of drugs people sometimes use this way include painkillers like codeine, tranquilizers like Valium, stimulants like uppers or speed, and sedatives like downers or sleeping pills. In your whole life, on how many days have you taken painkillers, tranquilizers, stimulants, and sedatives when they weren't prescribed for you or because you wanted the feeling they caused?

<table>
<thead>
<tr>
<th></th>
<th>1 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 days</td>
</tr>
<tr>
<td>3</td>
<td>3 to 5 days</td>
</tr>
<tr>
<td>4</td>
<td>6 to 11 days</td>
</tr>
<tr>
<td>5</td>
<td>12 to 19 days</td>
</tr>
<tr>
<td>6</td>
<td>20 days or more</td>
</tr>
<tr>
<td>8</td>
<td>I have never done this.</td>
</tr>
</tbody>
</table>

14. In the last 30 days, on how many days did you take painkillers, tranquilizers, stimulants, and sedatives when they weren't prescribed for you or because you wanted the feeling they caused?

<table>
<thead>
<tr>
<th></th>
<th>1 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 days</td>
</tr>
<tr>
<td>3</td>
<td>3 to 5 days (about 1 day a week)</td>
</tr>
<tr>
<td>4</td>
<td>6 to 11 days (about 2 days a week)</td>
</tr>
<tr>
<td>5</td>
<td>12 to 19 days (about 3 or 4 days a week)</td>
</tr>
<tr>
<td>6</td>
<td>20 days or more (5 days a week or more)</td>
</tr>
<tr>
<td>8</td>
<td>I have not done this in the past 30 days.</td>
</tr>
</tbody>
</table>

The Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) Resiliency Scale (Runyan, Curtis, Hunter, Black, Kotch, Bangdiwala, et al., 1998)

1. Is there an adult or adults you can turn to for help if you have a serious problem?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

2. Do you feel you can go to a parent or someone who is like a parent with a serious problem?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>
3. Could you go to another relative (not a parent) with a serious problem?
   1  Yes
   2  No

4. Has there ever been an adult outside of your family who has encouraged and believed in you?
   1  Yes
   2  No

5. Would you say this person has made a difference in your life?
   1  Yes
   2  No

6. How important is religion or spirituality to you?
   1  Not important at all
   2  Only a little important
   3  Somewhat important
   4  Very important

7. Over the past year, how many times did you go to church, synagogue, or attend religious or spiritual services or activities?
   1  Never
   2  Rarely or occasionally
   3  Once or twice a month
   4  Once a week or more
# Table 1

Description of Risk Indicators and Cumulative Risk Index

<table>
<thead>
<tr>
<th>Risk variable</th>
<th>Mean (SD)</th>
<th>Source</th>
<th>Risk status criterion</th>
<th>At-risk youth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>0.54 (0.39)</td>
<td>Parent</td>
<td>Based on current federal poverty guidelines</td>
<td>53.9</td>
</tr>
<tr>
<td>Prior reports of maltreatment</td>
<td>0.56 (0.42)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether there are prior reports of maltreatment</td>
<td>56</td>
</tr>
<tr>
<td>Maternal psychological distress</td>
<td>0.23 (0.43)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether there is maternal psychological distress</td>
<td>23.5</td>
</tr>
<tr>
<td>Witness to domestic violence</td>
<td>0.33 (0.47)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether child witnessed domestic violence</td>
<td>32.7</td>
</tr>
<tr>
<td>Youth poor ability to self-protect</td>
<td>0.54 (0.40)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether child is able to self-protect</td>
<td>53.5</td>
</tr>
<tr>
<td>Poor parenting</td>
<td>0.53 (0.40)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether there is poor parenting</td>
<td>52.5</td>
</tr>
<tr>
<td>Inappropriate or excessive discipline</td>
<td>0.12 (0.33)</td>
<td>Caseworker</td>
<td>Caseworker risk assessment of whether there is inappropriate or excessive discipline</td>
<td>12.2</td>
</tr>
</tbody>
</table>

Cumulative risk 2.85(1.60) 0 1 2 3 4 5 6 7

Distribution (%) 4.9 16.7 25.0 19.1 16.2 13.2 3.9 1.0

*Note.* Youth who met the risk criterion for any risk factor were coded 1; all others were coded 0. The number of risk factors was calculated for each participant to yield a cumulative risk score, with scores ranging from 0 to 7.
<table>
<thead>
<tr>
<th></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>
</tr>
</thead>
<tbody>
<tr>
<td>1. Soc. Risk (W1)</td>
<td>1.00</td>
<td>0.10</td>
<td>0.14†</td>
<td>0.10</td>
<td>0.12</td>
<td>0.14†</td>
<td>0.42**</td>
<td>0.19*</td>
<td>0.17*</td>
<td>0.11</td>
</tr>
<tr>
<td>2. Social Support (W1)</td>
<td>1.00</td>
<td>-0.16*</td>
<td>-0.29**</td>
<td>-0.04</td>
<td>-0.16*</td>
<td>0.13</td>
<td>-0.22**</td>
<td>0.06</td>
<td>-0.14</td>
<td></td>
</tr>
<tr>
<td>3. Peer Rejection (W3)</td>
<td>1.00</td>
<td>0.31**</td>
<td>0.15*</td>
<td>0.09</td>
<td>0.14†</td>
<td>0.25**</td>
<td>0.06</td>
<td>0.15*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Depressive Symptoms (W1)</td>
<td>1.00</td>
<td>0.20**</td>
<td>0.39***</td>
<td>0.14†</td>
<td>0.45***</td>
<td>0.11</td>
<td>0.18**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Substance Use (W1)</td>
<td>1.00</td>
<td>0.47***</td>
<td>0.12</td>
<td>0.14†</td>
<td>0.59***</td>
<td>0.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Involvement in Delinquent Acts (W1)</td>
<td>1.00</td>
<td>0.10</td>
<td>0.22**</td>
<td>0.31**</td>
<td>0.30**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Soc. Risk (W4)</td>
<td>1.00</td>
<td>0.41**</td>
<td>0.15†</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Depressive Symptoms (W4)</td>
<td>1.00</td>
<td>0.27**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Substance Use (W4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Involvement in Delinquent Acts (W4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.85</td>
<td>4.27</td>
<td>29.86</td>
<td>11.40</td>
<td>3.32</td>
<td>3.93</td>
<td>3.03</td>
<td>9.09</td>
<td>4.75</td>
<td>3.66</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.60</td>
<td>1.09</td>
<td>11.97</td>
<td>8.71</td>
<td>4.89</td>
<td>3.21</td>
<td>1.64</td>
<td>7.79</td>
<td>5.98</td>
<td>2.75</td>
</tr>
</tbody>
</table>
Table 3
Correlations, Means, and Standard Deviations for All Study Variables for Females ($n=212$) and Males ($n=57$)

<table>
<thead>
<tr>
<th></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>M\textsubscript{Females}</th>
<th>SD\textsubscript{Females}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Soc. Risk (W1)</td>
<td>1.00</td>
<td>0.10</td>
<td>0.17*</td>
<td>0.06</td>
<td>0.13</td>
<td>0.10</td>
<td>0.20*</td>
<td>0.20*</td>
<td>0.14</td>
<td>2.84</td>
<td>1.60</td>
</tr>
<tr>
<td>2. Social Support (W1)</td>
<td>-0.06</td>
<td>1.00</td>
<td>-0.16*</td>
<td>-0.33**</td>
<td>0.08</td>
<td>-0.13†</td>
<td>-0.25**</td>
<td>0.06</td>
<td>-0.13</td>
<td>4.27</td>
<td>1.08</td>
</tr>
<tr>
<td>3. Peer Rejection (W3)</td>
<td>0.21</td>
<td>-0.10</td>
<td>1.00</td>
<td>0.24**</td>
<td>0.06</td>
<td>0.11</td>
<td>0.22**</td>
<td>-0.13</td>
<td>0.12</td>
<td>30.63</td>
<td>12.28</td>
</tr>
<tr>
<td>4. Dep. Symptoms (W1)</td>
<td>0.24</td>
<td>-0.11</td>
<td>0.67*</td>
<td>1.00</td>
<td>0.18*</td>
<td>0.40**</td>
<td>0.44**</td>
<td>0.09</td>
<td>0.16*</td>
<td>11.79</td>
<td>8.89</td>
</tr>
<tr>
<td>5. Substance Use (W1)</td>
<td>0.06</td>
<td>-0.10</td>
<td>0.16</td>
<td>0.23</td>
<td>1.00</td>
<td>0.43**</td>
<td>0.10</td>
<td>0.54***</td>
<td>0.15†</td>
<td>3.53</td>
<td>1.86</td>
</tr>
<tr>
<td>6. Involvement in Delinquent Acts (W1)</td>
<td>0.34</td>
<td>-0.28†</td>
<td>0.29†</td>
<td>0.37*</td>
<td>0.59**</td>
<td>1.00</td>
<td>0.19*</td>
<td>0.24**</td>
<td>0.28**</td>
<td>3.89</td>
<td>3.09</td>
</tr>
<tr>
<td>7. Dep. Symptoms (W4)</td>
<td>0.23</td>
<td>-0.21</td>
<td>0.44**</td>
<td>0.64**</td>
<td>0.58**</td>
<td>0.66**</td>
<td>1.00</td>
<td>0.24**</td>
<td>0.42**</td>
<td>9.72</td>
<td>8.23</td>
</tr>
<tr>
<td>8. Substance Use (W4)</td>
<td>0.06</td>
<td>-0.07</td>
<td>0.34*</td>
<td>0.25</td>
<td>0.61**</td>
<td>0.55**</td>
<td>0.36*</td>
<td>1.00</td>
<td>0.45**</td>
<td>5.15</td>
<td>3.21</td>
</tr>
<tr>
<td>9. Involvement in Delinquent Acts (W4)</td>
<td>0.04</td>
<td>-0.15</td>
<td>0.29†</td>
<td>0.30†</td>
<td>0.54**</td>
<td>0.54**</td>
<td>0.58**</td>
<td>0.57**</td>
<td>1.00</td>
<td>3.73</td>
<td>2.78</td>
</tr>
</tbody>
</table>

M\textsubscript{Males}          | 2.89  | 4.27  | 26.74 | 9.91  | 2.51  | 4.17  | 6.53  | 3.10  | 3.36  |

SD\textsubscript{Males}         | 1.64  | 1.12  | 10.14 | 7.78  | 1.98  | 3.69  | 4.61  | 2.64  | 2.66  |
### Table 4

Percentage of Clients in Clinically Significant Range for Depressive Symptoms and Delinquency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive Symptoms (W1)</td>
<td>11.4</td>
</tr>
<tr>
<td>Depressive Symptoms (W3)</td>
<td>9.3</td>
</tr>
<tr>
<td>Depressive Symptoms (W4)</td>
<td>7.5</td>
</tr>
<tr>
<td>Delinquency (W1)</td>
<td>9.7</td>
</tr>
<tr>
<td>Delinquency (W3)</td>
<td>10.1</td>
</tr>
<tr>
<td>Delinquency (W4)</td>
<td>8.2</td>
</tr>
</tbody>
</table>

*Note.* The percentages reported above are based on scores of 65 or greater, as reported by participants to be in the clinically significant range; W1 = Wave 1, W3 = Wave 3, W4 = Wave 4.
<table>
<thead>
<tr>
<th>Type of Substance</th>
<th>Wave 1 Percentage of Sample</th>
<th>Wave 3 Percentage of Sample</th>
<th>Change from Previous Wave?</th>
<th>Wave 4 Percentage of Sample</th>
<th>Change from Previous Wave?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>134</td>
<td>51.7</td>
<td>Increase</td>
<td>151</td>
<td>Increase</td>
</tr>
<tr>
<td>Cigarettes</td>
<td>153</td>
<td>51.7</td>
<td>Decrease</td>
<td>155</td>
<td>Increase</td>
</tr>
<tr>
<td>Chewing tobacco</td>
<td>76</td>
<td>28.3</td>
<td>Decrease</td>
<td>66</td>
<td>Decrease</td>
</tr>
<tr>
<td>Marijuana</td>
<td>111</td>
<td>41.3</td>
<td>Decrease</td>
<td>121</td>
<td>Increase</td>
</tr>
<tr>
<td>Sniffing glue</td>
<td>91</td>
<td>23.4</td>
<td>Decrease</td>
<td>66</td>
<td>Increase</td>
</tr>
<tr>
<td>Hard drugs (e.g. cocaine, heroin)</td>
<td>80</td>
<td>23.8</td>
<td>Decrease</td>
<td>70</td>
<td>Increase</td>
</tr>
<tr>
<td>Prescription pills</td>
<td>95</td>
<td>35.3</td>
<td>Decrease</td>
<td>87</td>
<td>Increase</td>
</tr>
</tbody>
</table>
Table 6
Unstandardized Regression Coefficients and Standard Errors for Entire Sample with Depressive Symptoms as Outcome

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dep. Symptoms (W1) → Dep. Symptoms (W4)</td>
<td>0.393***</td>
<td>0.053</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Dep. Symptoms (W4)</td>
<td>0.917*</td>
<td>0.380</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Dep. Symptoms (W4)</td>
<td>Dep. Symptoms (W1)</td>
<td>0.521</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>1.109†</td>
<td>0.607</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>Dep. Symptoms (W1)</td>
<td>0.903</td>
</tr>
<tr>
<td>Social Support (W1) → Dep. Symptoms (W4)</td>
<td>-1.531**</td>
<td>0.511</td>
</tr>
<tr>
<td>Social Support (W1) → Dep. Symptoms (W4)</td>
<td>Dep. Symptoms (W1)</td>
<td>-0.695</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>-1.627*</td>
<td>0.797</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>Dep. Symptoms (W1)</td>
<td>-0.726</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Dep. Symptoms (W4)</td>
<td>0.426**</td>
<td>0.157</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Dep. Symptoms (W4)</td>
<td>Dep. Symptoms (W1)</td>
<td>0.076†</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>0.093</td>
<td>0.044</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>Dep. Symptoms (W1)</td>
<td>0.135</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Dep. Symptoms (W4)</td>
<td>0.061</td>
<td>0.092</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Dep. Symptoms (W4)</td>
<td>Dep. Symptoms (W1)</td>
<td>0.051</td>
</tr>
</tbody>
</table>

Note. SR (W1) x SS (W1) = Abbreviation for “socioenvironmental risk at Wave 1 by social support at Wave 1 interaction”. The bars in the first column indicate that the effects of the variables following the bars have been partialled out.

*p < .05. **p < .01. *** p < .001.
Table 7
Unstandardized Regression Coefficients and Standard Errors for Entire Sample with Substance Use as Outcome.

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance Use (W1) → Substance Use (W4)</td>
<td>0.239**</td>
<td>0.024</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Substance Use (W4)</td>
<td>0.645*</td>
<td>0.305</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Substance Use (W4)</td>
<td>0.483</td>
<td>0.337</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>1.109†</td>
<td>0.607</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>1.091</td>
<td>0.783</td>
</tr>
<tr>
<td>Social Support (W1) → Substance Use (W4)</td>
<td>0.305</td>
<td>0.405</td>
</tr>
<tr>
<td>Social Support (W1) → Substance Use (W4)</td>
<td>0.244</td>
<td>0.346</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>-1.627*</td>
<td>0.797</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>-1.604*</td>
<td>0.824</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Substance Use (W4)</td>
<td>0.126</td>
<td>0.157</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Substance Use (W4)</td>
<td>0.090</td>
<td>0.214</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>0.093</td>
<td>0.044</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>0.081</td>
<td>0.066</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Substance Use (W4)</td>
<td>0.094†</td>
<td>0.025</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Substance Use (W4)</td>
<td>0.062</td>
<td>0.044</td>
</tr>
</tbody>
</table>

*Note. SR (W1) x SS (W1) = Abbreviation for “socioenvironmental risk at Wave 1 by social support at Wave 1 interaction”. The bars in the first column indicate that the effects of the variables following the bars have been partialled out.

*p < .05. **p < .01. ***p < .001
Table 8
Unstandardized Regression Coefficients and Standard Errors for Entire Sample with Involvement in Delinquent Acts as Outcome

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delinquency (W1) → Delinquency (W4)</td>
<td>0.256***</td>
<td>0.061</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Delinquency (W4)</td>
<td>0.184</td>
<td>0.128</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Delinquency (W4)</td>
<td>Delinquency (W1)</td>
<td>0.042</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>1.109†</td>
<td>0.607</td>
</tr>
<tr>
<td>Socioenvironmental Risk (W1) → Peer Rejection (W3)</td>
<td>Delinquency (W1)</td>
<td>0.005</td>
</tr>
<tr>
<td>Social Support (W1) → Delinquency (W4)</td>
<td>-0.307†</td>
<td>0.175</td>
</tr>
<tr>
<td>Social Support (W1) → Delinquency (W4)</td>
<td>Delinquency (W1)</td>
<td>-0.170</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>-1.627*</td>
<td>0.797</td>
</tr>
<tr>
<td>Social Support (W1) → Peer Rejection (W3)</td>
<td>Delinquency (W1)</td>
<td>-1.572†</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Delinquency (W4)</td>
<td>0.033*</td>
<td>0.014</td>
</tr>
<tr>
<td>Peer Rejection (W3) → Delinquency (W4)</td>
<td>Delinquency (W1)</td>
<td>0.028*</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>0.093</td>
<td>0.044</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Peer Rejection (W3)</td>
<td>Delinquency (W1)</td>
<td>0.072</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Delinquency (W4)</td>
<td>0.102</td>
<td>0.028</td>
</tr>
<tr>
<td>SR (W1) x SS (W1) → Delinquency (W4)</td>
<td>Delinquency (W1)</td>
<td>0.094</td>
</tr>
</tbody>
</table>

*Note. SR (W1) x SS (W1) = Abbreviation for “socioenvironmental risk at Wave 1 by social support at Wave 1 interaction”. The bars in the first column indicate that the effects of the variables following the bars have been partialled out.

*p < .05. **p < .01. *** p < .001.
Figure 1a. Hypothesized mediated-moderation model of the relation between socioenvironmental risk and depressive symptomatology for sexually maltreated youth.
Figure 1b. Hypothesized mediated-moderation model of the relation between socioenvironmental risk and substance use for sexually maltreated youth.
**Figure 1c.** Hypothesized mediated-moderation model of the relation between socioenvironmental risk and involvement in delinquent acts for sexually maltreated youth.
Figure 2a. Mediated moderation model of the relation between socioenvironmental risk, social support, peer rejection, and depressive symptoms after controlling for initial levels of depressive symptoms. Unstandardized regression coefficients are reported; standard errors are in parentheses.

$\dagger p < .10$. $^* p < .05$. $^{**} p < .01$. 
Figure 2b. Mediated moderation model of the relation between socioenvironmental risk, social support, peer rejection, and substance use after controlling for initial levels of substance use. Unstandardized regression coefficients are reported; standard errors are in parentheses.

†p < .10. *p < .05. **p < .01.
Figure 2c. Mediated moderation model of the relation between socioenvironmental risk, social support, peer rejection, and involvement in delinquent acts after controlling for initial levels of involvement in delinquent acts. Unstandardized regression coefficients are reported; standard errors are in parentheses. Unstandardized regression coefficients are reported; standard errors are in parentheses. 
†p < .10. *p < .05. **p < .01.