

Internalizing and Externalizing Pathways to Suicidality in Abused and Neglected Children

Grown Up

by

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Abstract

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This dissertation examines major depressive disorder (MDD), substance abuse and/or dependence (DA), antisocial personality disorder (ASPD), and borderline personality disorder (BPD) as potential mediators of the relationship between child abuse/neglect and suicidality in middle adulthood. Children with documented cases of physical and sexual abuse and neglect (ages 0-11) during 1967-1971 were matched with non-maltreated children and followed into middle adulthood (approximately age 40). Mediators were assessed in young adulthood (approximately age 29) through in-person interviews between 1989 and 1995. Suicidality was assessed via self-report during 2000-2002 (N = 892). Logistic regressions were used to test whether: (1) Children with documented histories of child abuse/neglect (as well as specific types of abuse/neglect) were at increased risk for suicidal ideation and suicidal behavior in middle adulthood in comparison with matched controls; (2) Children who have documented histories of abuse/neglect were at increased risk for lifetime diagnoses of MDD, DA, ASPD, and BPD in comparison with matched controls; and (3) Diagnoses of MDD, DA, ASPD, and BPD mediate the relationship between child abuse/neglect and suicidality. Interactions for sex and race were also examined and separate analyses were conducted for males, females, Blacks, and Whites. Child abuse/neglect was associated with increased risk for suicidality in middle adulthood and only MDD mediated the relationship between child abuse/neglect and suicidality. When specific

types of abuse/neglect were considered, ASPD mediated the relationship for neglect and suicidality, while MDD and BPD mediated the associations for physical abuse and suicidality and multiple forms of maltreatment and suicidality. Separate analyses for males and females revealed significant sex differences. MDD acted as a mediator between child abuse/neglect and suicidality only for females, BPD was a mediator between child abuse/neglect and suicidality for males, and ASPD was a mediator for both abused/neglected males and sexually abused females. While MDD significantly mediated the relationship between child abuse/neglect for Whites, none of the diagnoses mediated the relationship between abuse/neglect and suicidality for Blacks. These results suggest the importance of considering the roles not only of internalizing symptoms but also of externalizing symptoms in suicide risk assessments among the maltreated population.

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Introduction

Suicide is the eleventh leading cause of death for all ages in the United States (CDC, 2005) and the fourteenth leading cause of death for all ages worldwide (Krug, Dahlberg, Mercy, Zwi, & Lorenzo, 2002). More than 32,000 suicides occurred in the United States in 2004 (CDC, 2005). Among adolescents and young adults, suicide is the third leading cause of death in the United States, accounting for 4,599 deaths in 2004 (CDC, 2005), including one suicide for approximately every 150 attempts (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). Furthermore, in 2005, 16.9% of U.S. high school students reported that they had seriously considered attempting suicide within the past year, and 8% of those students reported that they had attempted suicide one or more times during the same period (Eaton, Kann, Kinchen, Rodd, Hawkins, Harris, et al., 2006). Therefore, the need to understand the psychological correlates of suicide extend beyond those individuals who complete suicides to the many individuals who survive suicide attempts, as well as to those who have not yet made attempts but are considering doing so (Krug et al., 2002).

Definitions

“Suicidal behavior ranges in degree from merely thinking about ending one’s life, through developing a plan to commit suicide and obtaining the means to do so, attempting to kill oneself, to finally carrying out the act (“completed suicide”)” (Krug et al., 2002, p. 185). In any definition of suicide, the intent to die is a key element. However, it is often difficult to ascertain intent in suicides unless the individuals have made clear statements about their intentions (Krug et al., 2002). Therefore, defining suicide and suicidal behavior is problematic. There has been significant debate about the most suitable definition for suicidal behavior (Krug et al., 2002). The terms “completed suicide” and “fatal suicidal behavior” are most commonly used to refer to

suicidal acts that result in death (Krug et al., 2002). Similarly, “non-fatal suicidal behavior,” “attempted suicide,” “parasuicide,” and “deliberate self-harm” are terms most frequently used to refer to non-fatal suicidal behavior (Krug et al., 2002). The term “suicidal ideation” refers specifically to thoughts of killing oneself and does not refer to suicidal behavior per se (Krug et al., 2002). “Suicidality” refers to the constellation of suicidal ideation, suicidal behavior, and suicide attempts (Bergen, Martin, Richardson, Allison, & Roeger, 2003). The remainder of this paper is focused on the full spectrum of suicidal ideation, behavior, and attempts and will, therefore, use the term “suicidality” for ease of reference.

Literature on Child Maltreatment and Suicidality

A history of physical abuse, sexual abuse, or neglect in childhood is believed to increase the risk of suicidality in adolescents and adults (Brezo, Paris, Vitaro, Hebert, Tremblay, & Turecki, 2008; Brown, Cohen, Johnson, & Smailes, 1999; Deykin, Alpert, & McNamarra, 1985; Martin, Bergen, Richardson, Roeger, & Allison, 2004; Peters & Range, 1995). The possibility that child abuse and neglect may place children at an increased risk for later self-destructive behavior in the form of suicide has received considerable attention since Green (1978) found that among 59 physically abused children, the rates of suicide attempts and self-harming behaviors were significantly higher than for neglected children or non-abused controls. Furthermore, traumatic childhood experiences that occur within the context of family and caregiving relationships are thought to have strong associations with self-destructive behaviors (Gratz, Conrad, & Roemer, 2002). Green (1978) suggested that incidents of maltreatment have a cumulative effect on children, increasing their risk for using self-destructive behaviors to cope. Combined with unstable families and poorly developed coping skills, abused and neglected children are thought to manifest greater risk for suicidal behaviors as they grow up than those

children who have not been subjected to maltreatment in childhood.

In addition, recent research has suggested that children experiencing multiple forms of maltreatment are at an even greater risk for later psychological consequences than children exposed to only one form of maltreatment (Brezo et al., 2008; Clemmons, Walsh, DiLillo, & Messman-Moore, 2007). Within the child maltreatment literature, children with documented histories of multiple forms of child maltreatment have been shown to exhibit greater internalizing and externalizing symptoms, depression, anger and aggression, posttraumatic stress symptoms, and less social competence than children with histories of only one type of maltreatment (Clemmons et al., 2007; English, Graham, Litrownik, Everson, & Bangdiwala, 2005; Lau et al., 2005; Rossman, Hughes, & Hanson, 1998). Furthermore, among adult samples, histories of comorbid sexual and physical abuse have been associated with more severe psychiatric symptomatology (Brown & Anderson, 1991; Schaaf & McCanne, 1998). In fact, a study of college students found that students who reported histories of multiple forms of child maltreatment also reported greater symptoms of depression, substance abuse, delinquency, and suicidal behavior (Arata, Langhinrichsen-Rohling, Bowers, & O’Farrill-Swails, 2005). Additionally, a recent study found that adults reporting histories of both sexual and physical abuse in childhood reported higher rates of suicidal behaviors than their peers reporting either sexual or physical abuse (Brezo et al., 2008). Although these studies have methodological shortcomings, including the use of retrospective self-reports of childhood abuse and neglect, they suggest the importance of considering the potential of increased risk for psychopathology and suicidality among those individuals who have experienced the cumulative effects of multiple forms of child maltreatment.

Sex Differences in Suicidality

In order to better understand the relation between child maltreatment and suicidality, we cannot overlook the well-documented sex disparities in suicidality among the general population. Males complete suicides at nearly four times the rate of females, and represent 78.8% of all completed suicides in the United States (CDC, 2005). In fact, every country other than China shows a similar pattern of male suicides surpassing female suicides (Hunt, Sweeting, Keoghan, & Platt, 2006). This phenomenon has received substantial attention, particularly in light of the fact that women consistently report higher rates of suicidal ideation and nonfatal suicidal behavior (Beautrais, 2006; Canetto, 1997). During their lifetime, women attempt suicide approximately two to three times more often than men (Krug et al., 2002). One frequently cited explanation for this sex difference is that men typically use more lethal methods of self-inflicted injury (Beautrais, 2002, 2006; Denning, Conwell, King, & Cox, 2000). Specifically, firearms are the most commonly used method of suicide among males, while poisoning is the most common method of suicide for females (CDC, 2005). Other possible explanations for this sex difference include: higher rates of psychopathology in males; higher rates of substance abuse in males; more violent behavior among males; and less use of mental health services by males (Beautrais, 2002, 2006; Denning et al., 2000). Beautrais (2002) suggests that the disproportionate rate of male suicides “obscure[s] the fact that women are more suicidal than men” (p. 155) and urges that research focusing on the morbidity of suicidal behavior rather than the suicide itself will greatly benefit suicide treatment and prevention.

Although it is generally accepted that a sex disparity exists in suicidal behavior, research examining the relation between suicidality and child maltreatment has almost exclusively focused on female victims (Bergen et al., 2003; Curtis, 2006; Deykin et al., 1985; Martin et al.,

2004, Peters & Range, 1995; Stone, 1993). Therefore, research in this area has largely overlooked the sex disparity of suicidality when addressing suicidality in maltreated children and adults. In order to address this shortcoming in the literature, recent research by Landry and Widom (2007) specifically examined sex differences in suicidality among a sample of maltreated and matched nonmaltreated children who were followed prospectively into young adulthood. An assessment of suicidality completed when the participants were approximately 29 years old, found that abused and neglected children, as a group, were more likely to report three types of suicidality: wish for death, thoughts of suicide, and suicide attempts. However, when males and females were examined separately, abuse and neglect had differing relationships to the suicidality variables for the sexes. Specifically, abuse and neglect predicted suicidal thoughts, wish for death, and suicide attempts in women, but did not predict suicidal thoughts in men. These findings highlight the need for further research examining sex differences in suicidality and the possible pathways from child maltreatment to adult suicidality for both men and women.

Depression and Suicidality

One area of research receiving recent attention in both the areas of child maltreatment and suicidality is the presumed differing roles of externalizing and internalizing behaviors for males and females. Females have long been thought to be at greater risk for internalizing problems, such as depression (Lansford, Malone, Stevens, Dodge, Bates, & Pettit, 2006). Depression is the most frequent form of psychopathology associated with suicidality, and has been indicated as a major risk factor in completed suicides (Kessler, Borges, & Walters, 1999). The World Report on Violence and Health (Krug et al., 2002) reported that up to 80% of people who commit suicide also exhibit several symptoms of depression. Therefore, it is not surprising that depression is the most common mediating variable examined in relation to child

maltreatment and suicidality, or that most studies have focused on females (Krug et al., 2002). However, recent research has suggested that depression is not only an important correlate of suicidality for females (Beautrais, 2002, 2006), but should also be considered a risk factor for males (Krug et al., 2002). The fact that depression is often difficult to detect in men, who seek mental health assistance less frequently than woman, has been suggested as a possible explanation for the sex difference in completed suicides (Krug et al., 2002). This argument suggests that depression is an important correlate of suicidality for both males and females, but that the presentation of depression is not being recognized as such in males.

Male and female presentations of depression have been suggested to be different, such that symptoms of depression in males present as symptoms more traditionally considered externalizing rather than internalizing, such as violence, aggression, substance use, and antisocial behaviors (Baldry, 2007; Baldry, 2003; Baldry & Farrington, 2000; Duncan, 1999; Junger, Stroebe, & van der Laan, 2001). Worchel, Nolan, and Wilson (1987) conducted an item analysis of the Beck Depression Inventory (BDI) for a sample of adolescent boys and girls with similar Total Depression scores, and found that girls endorsed more internalizing symptoms while boys endorsed more externalizing symptoms. Gjerde, Block, and Block (1978) examined psychologist ratings of dysphoric symptoms for a sample of adult men and women and found that dysphoric men were rated as more disagreeable, aggressive, and antagonistic, whereas women were seen as more ruminative. Nolen-Hoeksema (1990) suggested that men use externalizing efforts to distract themselves from depression, which leads to diagnoses of externalizing disorders and substance abuse rather than depression. The Mayo Clinic (2004) published a report urging clinicians to be more attuned to male presentations of depression. The report indicated that, unlike the internalizing symptoms often seen in women with depression,

depressed men more often present with symptoms of anger, violent behavior, risk-taking behavior, and abuse of alcohol and drugs. Extending these findings to the maltreatment literature, it has been suggested that when men experience depression resulting from a history of maltreatment, their symptoms are less likely to be identified as depression due to the fact that clinicians and researchers might not look beyond what appear at first glance to be externalizing symptoms (Krug et al., 2002). Therefore, it is possible that the presentation of externalizing problems is precluding the diagnosis of depression in males who were abused and/or neglected in childhood, resulting in men receiving services for their externalizing symptoms, rather than their underlying depression. If a man is at risk for suicidal behaviors, failing to recognize and identify depressive symptoms as related to suicidality could be detrimental to the well-being of that individual.

Externalizing Behaviors and Suicidality

While recognizing that sex differences in clinical presentations of internalizing symptoms may help explain the differences in suicidality among some maltreated individuals, it does not explain the full spectrum of suicidal behaviors seen in this population. Research indicates that individuals with a history of childhood maltreatment are also at increased risk, compared to their nonmaltreated peers, for exhibiting externalizing behaviors, such as aggression, conduct disorders, and delinquency (Lansford et al., 2006; Widom, 1997). Not only do sex differences in internalizing symptoms suggest possible explanations for sex differences in suicidality among maltreated children, but possible sex differences in externalizing symptoms may be relevant here as well. It is important to note that researchers have found that psychiatric diagnoses tend to conform to societal stereotypes about sex roles, such that females are more often given diagnoses that conform to “feminine” characteristics and males tend to receive diagnoses characterized by

more traditional “masculine” characteristics (Dixon, Gordon, & Khomusi, 1995; Widom, 1984). Therefore, it appears that sex stereotyping does not only impact the diagnosis of internalizing symptoms, but it may influence the diagnosis of externalizing symptoms as well. Just as women are more often diagnosed with internalizing symptoms, men are more likely to be diagnosed with externalizing symptoms, such as antisocial behavior (Baldry, 2007; Kerig, 1999; Kolbo, Blakley, & Engleman, 1996).

When one considers the maltreated population, failure to recognize externalizing symptoms in females and internalizing symptoms in males might be particularly detrimental for deciding the most appropriate treatment interventions. Recent research has suggested that males and females are both at increased risk for non-sex-role stereotyped symptoms. Specifically, maltreated males appear to exhibit increased internalizing symptoms and maltreated females present with increased externalizing symptoms in comparison to the general population. For example, Baldry (2007) found that in a sample of 532 adolescents, externalizing problems were significantly associated with physical and sexual abuse for both boys and girls. Exposure to abuse was associated with increased risk of aggressive and deviant acts, suggesting that both males and females exposed to childhood maltreatment are at an increased risk for externalizing problems. Contrary to prior belief, Verona and Sachs-Ericsson (2005) found that self-reports of child abuse were associated with higher numbers of externalizing symptoms, particularly for women, among a sample of 5,424 adults taking part in a national epidemiological study. Furthermore, Maxfield and Widom (1996) reported increased risk for arrests for crime and violence among male and female abused and neglected children compared to controls. More recently, Widom and Czaja (2007) found that maltreatment increases risk for internalizing and externalizing symptoms in both males and females. When relating child maltreatment to

suicidality, Grilo, Sanislow, Fehon, Lipschitz, Martino, and McGlashan (1999) found that both internalizing and externalizing problems predicted suicidality in male and female adolescents who reported child abuse. In addition, they found that the relation between externalizing problems and suicidality differentiated the abused adolescents from the non-abused adolescents, who exhibited primarily internalizing pathways to suicidality. Grilo et al. (1999) suggested that their finding supports the “cycle of violence” for maltreated children, such that “violence begets violence both against oneself and others” (p. 426).

Research findings supporting the overwhelming influence of major depressive disorder (MDD) on suicidality continue to guide the focus of suicidality research towards internalizing disorders (Angst, DeGonda, & Ernst, 1992; Apter, Gothelf, Orbach, Har-even, Weizman, & Tyano, 1995; Beck, Steer, Sanderson, & Skeie, 1991; McHolm, MacMillan, & Jameison, 2003). For example, Kessler et al.’s (1999) finding that the odds ratio for major depression was 11.0 in suicidal participants compared to 5.7 for antisocial personality disorder (ASPD), and 5.6 for panic disorder (PD) led to the conclusion that MDD is the most important risk factor for suicidality, overshadowing the significant contributions of the externalizing disorders.

Therefore, while previous research has consistently found a strong association between internalizing disorders and suicidality, it is possible that the increases in externalizing disorders among maltreated children are resulting in an additional pathway to suicidality, one characterized predominantly by externalizing symptoms. Externalizing disorders, such as cluster B personality disorders, have begun to receive increased focus in the suicide literature recently. In a study of suicidality, Verona, Sachs-Ericsson, and Joiner (2004) emphasized that externalizing disorders may be related to the impulsive and anger-related behaviors associated with many suicides. Examining suicide attempts, internalizing, and externalizing

psychopathology among a sample of 4,745 adults in the general population, Verona et al. found that suicidal women were more likely than suicidal men to have an internalizing disorder and men were more likely to have an externalizing disorder. However, consistent with the findings of researchers such as Baldry (2003, 2007) and Junger et al. (2001), suicidal men were also more likely than woman to have a history of both internalizing and externalizing symptoms, suggesting that we must consider both internalizing and externalizing symptoms in males.

In one study examining the roles of both externalizing and internalizing disorders, Hills Cox, McWilliams, and Sareen (2005) used a sample of 5,877 participants ranging in age from 15 to 54 years to replicate and extend Verona et al.'s (2004) findings by differentiating between anxious-misery internalizing disorders, such as major depression, and fear internalizing disorders, such as phobic disorders. Participants were determined to have an anxious-misery disorder if they met diagnoses for major depression, dysthymia, generalized anxiety disorder, or posttraumatic stress disorder. Externalizing disorder was considered present if the participants were diagnosed with antisocial personality disorder, drug dependence, or alcohol dependence. They found that anxious-misery and externalizing disorders were both significantly associated with suicide attempts, but that fear disorders were not. Externalizing disorders were associated with suicide attempts even in the absence of internalizing disorders. Both Verona et al. (2004) and Hills et al. (2005) concluded that the risk-taking behavior and/or impulse-control deficits associated with externalizing disorders appear to be independently contributing to suicidal behavior.

Considering that both internalizing and externalizing symptoms appear to be contributing to suicidal behavior, it is important that future research examine why certain individuals abused as children may develop internalizing diagnoses leading to suicidality, while others develop

externalizing diagnoses leading to suicidality. Furthermore, it is necessary to examine some of the underlying cognitive mechanisms and personality traits that may be contributing to suicidality in both internalizing and externalizing diagnoses.

The Role of Hopelessness, Impulsivity, and Cluster B Personality Disorders

Hopelessness

Although researchers and clinicians generally believe that the presence of MDD increases the risk of suicidality (Chioqueta & Stiles, 2007), a number of researchers have suggested that hopelessness, rather than the diagnosis of MDD, is the best predictor of suicidality. Over the past 20 years, researchers have found that feelings of hopelessness contribute to suicidality over and above the diagnosis of MDD (Alford, Lester, Patel, Buchanan, & Giunta, 1995; Beck et al., 1985; Kuo, Gallo, & Eaton, 2004). Hopelessness has consistently been found to be associated with suicidal ideation (Beck et al., 1985; Chioqueta & Stiles, 2007), suicide attempts (Weishaar & Beck, 1990; Wetzel, 1976), and completed suicides (Beck, Brown, Berchirck, Stewart, & Steer, 1990; Weishaar & Beck, 1990). While hopelessness is not a stable characteristic, it appears to be more stable than psychiatric diagnoses, particularly MDD (Malone, Oquendo, Hass, Ellis, Lee, & Mann, 2000). Malone, Haas, Sweeney, and Mann (1995) found that even after acute hopelessness remits, such as upon remission of a major depressive episode, significantly higher levels of hopelessness continue to remain in patients with a history of suicide attempts than in patients without such a history.

According to Beck (1967), hopelessness acts as the mediator between major depression and suicidality. Therefore, although hopelessness is a core characteristic of depression, Beck believes that hopelessness is more predictive of suicide attempts than a diagnosis of MDD. Minkoff, Bergman, Beck, and Beck (1973) found that suicidal ideation was more highly

correlated with hopelessness than with depression. Beck, Kovacs, and Weissman (1975) found that among 384 suicidal inpatients who self-reported suicidal ideation, hopelessness, and depression, hopelessness accounted for 76% of the relationship between depression and self-reported suicide attempts. Bedrosian and Beck (1979) and Wetzel, Margulies, and Davis (1980) found that hopelessness was also more highly associated with suicidal ideation than depression, even in the absence of suicide attempts. In fact, the most commonly used measure of hopelessness, the Beck Hopelessness Scale (BHS) (Beck, 1988), accurately predicted 90.9% of eventual completed suicides in a sample of 165 individuals exhibiting suicidal ideation who were followed for between five to ten years (Beck, Weissman, Lester, & Trexel, 1974). Similarly, in a study of 1,969 outpatients followed for six years, the BHS accurately predicted 15 of 16 completed suicides (93.8%) (Beck, 1986). Drake and Cotton (1986) also found that clinician ratings of hopelessness accurately predicted eventual suicides among inpatients, suggesting that both self-reported and clinician-rated hopelessness are useful in determining risk for suicide completion.

Hopelessness is also believed to increase risk for suicidality among individuals diagnosed with personality disorders (Beck et al., 1985). Beck et al. found that hopelessness not only predicted completed suicides in depressed patients, but hopelessness also predicted suicide attempts and completed suicides in patients with personality disorders. Beck et al. theorized that hopelessness is a psychological state that increases to peak levels of intensity during acute episodes of psychiatric disturbance. When psychiatric disturbance remains at a relatively constant level of severity, hopelessness may show recurring high levels of intensity, which may display itself as suicide attempts (Beck et al., 1985). Following this theory, if hopelessness repeatedly peaks leading to repeated suicide attempts, the risk that any one attempt may be

completed increases the chance of eventual death by suicide (Beck et al., 1985). In support of this, Beck et al. found that the only factor differentiating hospitalized psychiatric patients (both male and female) who eventually died by suicide from those who did not was a higher mean level of hopelessness.

Malone et al. (2000) studied negative life events in relation to hopelessness and suicidality and found that, while suicidal participants exhibited higher levels of hopelessness than non-suicidal participants, neither group differed significantly on the number of negative life events experienced. Malone et al. theorized that it is not the experience of negative life events that leads to suicidality, but the perception of those negative life events. Therefore, the high levels of hopelessness among suicidal individuals suggest that it is the cognitive appraisal of negative life experiences that may be most relevant to suicidality rather than the objective occurrence of those same events (Malone et al., 2000).

Several researchers have found that the one protective factor that consistently emerges for hopelessness is having good family relationships, such as strong family support systems and positive parenting techniques (Anteghini, Fonseca, Ireland, & Blum, 2001; Chioqueta & Stiles, 2007; Harris & Molock, 2000; Lewinsohn, Rodhe, & Seeley, 1994; Pharris, Resnick, & Blum, 1997; Anteghini et al., 2001). Anteghini et al. (2001) found that in adolescents, only good family relationships emerged as a protective factor against suicidal ideation for both boys and girls. Similarly, Pharris et al. (1997) found that the absence of hopelessness in a sample of 13,923 adolescents was associated with parental and family caring, as was the absence of suicidal ideation for both boys and girls. More specifically, Pharris et al. found that among adolescents with histories of sexual abuse, high levels of family connectedness and strong positive relationships with at least one parent were associated with lower levels of hopelessness

and suicidal ideation. Pharris et al. concluded that strong family relations act as a protective factor for adolescents in general, but particularly for sexually abused adolescents. Chioqueta and Stiles (2007) found that having a high level of family cohesion protected their sample of 314 young adults against suicidal ideation. In addition, Harris and Molock (2000) and Lewinsohn et al. (1994) found that perceiving oneself as having good family support was an important factor in reducing levels of suicidal ideation among high school and college students. Considering the high degree of family disruption occurring among abused and neglected abuse victims, these findings suggest that hopelessness may be an especially important factor in the risk for suicidality within this population.

While hopelessness has been the most widely recognized and researched cognitive correlate of suicidality, it has more often been associated with suicidality in women than in men (Brezo et al., 2006). Some researchers have suggested that while hopelessness is clearly associated with suicidal ideation and appears to be an important risk factor for suicide completions, it is not consistently associated with non-lethal suicide attempts (Brezo et al., 2006). Some researchers have theorized that there are two separate pathways to suicidality: hopelessness and impulsivity (Horesh, Orbach, Gothelf, Efrati, & Apter, 2003; Kernberg, 1978). Although impulsivity has received less attention in the suicidality literature than hopelessness, this attention has recently been increasing (Horesh et al., 2003).

Impulsivity

In a review of the suicidality literature, Brezo et al. (2005) found that the role of impulsivity in suicidal behavior has been generally supported. Specifically, impulsivity has been associated with suicide attempts in diverse populations, including children, adolescents, and adults. Impulsivity has been related to both suicide attempts and suicide completions among

individuals with Cluster B personality disorder diagnoses, males, and forensic populations.

Furthermore, impulsivity has been found to be associated with violent suicide methods.

Considering the evidence that males use more lethal suicide methods, some researchers have suggested that impulsivity may be an important risk factor for male suicides (Krug et al., 2007).

However, it is important to note that Conner, Cox, Duberstein, Tian, Nisbett, and Conwell (2001) found that when women complete suicides they often involve greater violence and impulsivity than completed suicides in men. Therefore, it is important to recognize that hopelessness and impulsivity may not be mutually exclusive, and that both may contribute to suicidality in men and women.

A number of researchers have posited that impulsivity may be associated with suicidal behaviors, such as attempts and completions, whereas hopelessness may be associated more with suicidal ideation and planning (Apter et al., 1995; Dumais, Lesage, Alda, Rouleau, Dumont, Chawky, et al., 2005; Garrison, McKeown, Valois, & Vincent, 1993; Horesh et al., 2003; Simon, Swann, Powell, Potter, Kresnow, & O'Carroll, 2002). Apter et al. (1995) proposed that suicide attempts could also be divided into two types: a planned desire to die, which is associated with depression and hopelessness, and impulsive attempts. In following this theory, Simon et al. (2001) sought to differentiate individuals who make impulsive suicide attempts and those who make non-impulsive suicide attempts based on levels of hopelessness and impulsiveness. They hypothesized that individuals who made impulsive attempts would be less depressed and hopeless but more impulsive than individuals who made non-impulsive attempts (Simon et al., 2001). In support of their hypothesis, they found that impulsiveness was positively associated with impulsive suicide attempts, while depression was negatively associated with impulsive attempts. However, they also found that hopelessness was positively associated with impulsive

suicide attempts in those individuals who also score high on impulsivity, suggesting that these constructs may not be completely independent in all individuals.

Conner, Meldrum, Wieczorek, Duberstein, and Welte (2004) examined the impact of impulsivity on suicidal behaviors to determine if impulsivity contributes to suicide attempts, but not suicidal ideation. They hypothesized that impulsivity would be associated with suicidal behavior that does not involve premeditation or planning, but not associated with suicidal ideation. Conner et al. found that when they measured impulsivity as a general construct, it was significantly associated with suicidal ideation. In response to this finding, Conner et al. suggested that researchers should consider impulsivity related to aggression rather than impulsivity in general when differentiating between suicidal ideation and impulsive suicidal behaviors.

Dumais et al. (2005) were specifically interested in impulsive behaviors associated with aggression. They examined whether a construct of aggressive-impulsivity contributed to suicidal behavior even when major depression was controlled. Using samples of male suicide completers and suicidal male noncompleters, Dumais et al. found that aggressive-impulsivity significantly predicted suicide attempts over and above depression in males with diagnoses of cluster B personality disorders (Antisocial Personality Disorder, ASPD, and Borderline Personality Disorder, BPD). They concluded that impulsivity and aggression should be examined more closely in association with suicidality, particularly in relation to BPD and ASPD for both males and females.

A series of studies by Horesh and colleagues (Horesh, 2001; Horesh, Gothelf, Ofek, & Weizman, 1999; Horesh et al., 2003) examined the relation between aggressive-impulsivity and suicidal behavior. Horesh et al. (1999) were interested in Apter et al.'s (1988) theory that

aggressive-impulsivity may be as important in some types of suicidal behaviors as depression is in other types. Specifically, Horesh et al. (1999) hypothesized that adolescents self-reporting high levels of aggression and impulsivity on an inpatient unit would be more suicidal than the non-aggressive and non-impulsive adolescents. While they found that the construct of aggressive-impulsivity was significantly and positively correlated with suicidality for boys, it was not for girls. Horesh (2001) replicated these findings using clinician ratings of aggression and impulsivity rather than self-reports. Horesh (2001) concluded that males are more likely to exhibit impulsive suicide attempts, while females are more likely to exhibit non-impulsive suicidal planning and attempts.

In seeking to explore whether females might also exhibit impulsive suicidal behaviors in some circumstances, Horesh et al. (2003) noted that a large proportion of individuals who complete suicides, or who make severe suicide attempts, suffer from personality disorders. They were particularly interested in females diagnosed with BPD, due to the fact that they are characterized by aggressive, impulsive, and suicidal behaviors. Examining suicidal behavior among a sample of adolescents hospitalized with a diagnosis of either BPD or MDD, Horesh et al. found that impulsivity was associated with suicidal behaviors in the BPD group but not the MDD group. They concluded that impulsivity is also related to suicidal behavior in females when they suffer from BPD.

Findings such as these suggest that the theories explaining sex disparities in suicidality based on different presentations of internalizing symptoms may not explain the full range of suicidal behaviors in male and female victims of child maltreatment. Research, such as Brezo et al.'s (2005) findings that sex discrepancies in suicidality are due to differences in internalizing and externalizing symptoms, makes sense if one assumes that females exhibit higher levels of

internalizing symptoms, such as depression and hopelessness, whereas males exhibit higher rates of externalizing symptoms, such as aggression and impulsivity. However, research such as that by Conner et al. (2001), which found that the relationship between aggression and completed suicides was greater in female completers than male completers, and Horesh et al.'s (2003) finding that males are not the only ones to engage in aggressive and impulsive suicidal behaviors, raises concern over limiting our theories of suicidal behavior to more traditional sex stereotyped views of internalizing and externalizing behaviors. Therefore, when one considers suicidality among victims of maltreatment, it would appear necessary to consider the possibility that elevated levels of internalizing and externalizing symptoms may represent two distinct pathways to suicidality in men and women.

In a study examining the association between childhood physical and sexual abuse in women and later suicidality, Brodsky, Oquendo, Ellis, Haas, Malone, and Mann (2001) found that child abuse was significantly related to both impulsivity and suicide attempts. However, they also found that participants who exhibited the trait of impulsivity but who did not self-report histories of child abuse were at an increased risk for suicide attempts, indicating that impulsivity alone did not mediate the relationship between child abuse and suicidality. When they also factored in diagnoses of BPD they found that abused women who exhibited impulsivity and met the diagnostic criteria for BPD were more likely to have attempted suicide than either abused women who were not diagnosed with BPD or non-abused women. In other words, the diagnosis of BPD was not only more common among women with histories of abuse, but it differentiated between abused women with histories of suicide attempts and those who had not attempted suicide. The abused women who met the diagnosis for BPD were found to rate higher on impulsivity than the abused women who exhibited impulsivity but did not meet the diagnosis of

BPD. Oquendo, Brent, Birmaher, Greenhill, Kolko, Stanley, et al. (2005) were interested in determining whether the relationship between child abuse, impulsivity, and suicidality existed for other personality disorders besides BPD. Using a sample of men and women recruited from inpatient hospital units, they found that impulsivity was not significantly related to child abuse status, but that it was significantly related to the cluster B personality disorders of BPD and ASPD. Furthermore, when considering MDD separately and in association with the cluster B disorders, they found that those individuals with a comorbid MDD and cluster B diagnosis were the most at risk for suicidality, and those without a cluster B diagnosis were the least at risk. In addition, they found that although women were most often diagnosed with BPD and men with ASPD, these diagnoses were not exclusive to the sexes.

Taken together these findings suggest that there are two pathways to suicidality: One associated with depression and hopelessness and one associated with impulsivity and the cluster B personality disorders. Although these pathways may not be completely independent, research supports the theory that different individuals may reach the similar state of suicidality in very different ways. Furthermore, it appears that these pathways may be particularly relevant for victims of child maltreatment due to the increased risk for internalizing and externalizing symptoms among victims of child abuse and neglect. Therefore, it is important to focus research attention not only on the internalizing pathways to suicidality among abused and neglected individuals, but to potential externalizing pathways.

Cluster B Personality Disorders and Suicidality

Of the personality disorders, antisocial personality disorder (ASPD) and borderline personality disorder (BPD) have most frequently been associated with suicidality. However, most studies in this area have focused on whether MDD alone or MDD with a co-morbid

personality disorder place individuals at greater risk for suicidality. Not surprisingly, due to the overwhelming focus on MDD, little attention has been given to the independent risk posed by personality disorder diagnoses. Several researchers have found that suicide attempts are more common among individuals with dual diagnoses of MDD and BPD than in individuals with MDD alone or MDD co-morbid with another personality disorder (Corbitt, Malone, Haas, & Mann, 1996; Kelly, Soloff, Lynch, Haas, & Mann, 2000). Recent studies, such as those by Verona et al. (2004) and Hills et al. (2005), suggest that personality disorders should be considered as a potentially independent pathway mediating the relationship from child maltreatment to suicidality. Yen, Shea, Pagano, Sanislow, Grilo, McGlashan et al. (2003) found that MDD, BPD, and substance dependence all independently contributed to suicide attempts, reinforcing the need for research differentiating these contributing factors.

Krysinska, Heller, and De Leo (2006) have further emphasized the need to consider personality disorder diagnoses as a risk factor for suicidality. In conducting a review of several psychological autopsy studies, Krysinska et al. found that as many as 57% of the individuals who died by suicide were diagnosed with personality disorders, with the risk for personality disorders higher in male than female suicides. In examining the prevalence of personality disorder diagnosis among studies of suicides and suicide attempts, Krysinska et al. noted that the cluster B personality disorders (ASPD and BPD) were the most frequently associated with suicidal behaviors.

In addition to the fact that BPD is characterized by emotional lability, impulsivity, and suicidal behaviors, it has also been associated with histories of child maltreatment, particularly sexual abuse. In fact, a number of retrospective studies have found that childhood sexual abuse is significantly correlated with suicidality among individuals suffering from BPD (Krysinska et

al., 2006; Sansone, Songer, & Miller, 2005; Soderberg, Kullgren, & Renberg, 2004).

Considering the findings of Oquendo et al. (2001), it appears that the diagnosis of BPD may place victims of child maltreatment at a higher risk for suicidality than victims of maltreatment who do not meet the diagnosis but who do exhibit impulsive tendencies. Rather than focusing our attention in suicidality risk assessments on traits of impulsivity in victims of child maltreatment, it may be more important to attend to impulsivity in conjunction with both histories of maltreatment and diagnoses of BPD. These findings suggest the need to further specify risk assessments from impulsive victims of child maltreatment to impulsive victims of child maltreatment who also meet the diagnostic criteria for BPD.

Using cross-sectional designs, researchers have consistently found an association between childhood sexual abuse and BPD (e.g., McLean & Gallop, 2003; Soderberg et al., 2004; Zanarini, Yong, Frankenburg, Hennen, Reich, Marino, & Vujanovic, 2002). A number of studies have also found that a history of childhood physical abuse or neglect is also associated with diagnosis of BPD (Herman, Perry, & van der Kolk, 1989; Ogata, Silk, Goodrich, Lohr, Westen, & Hill, 1990; Westen, Ludolph, Misle, Ruffind, & Block, 1990; Zanarini, Williams, Lewis, Reich, Vera, Marino, et al., 1997). Zanarini et al. (1997) found that approximately 60% of 358 patients with BPD reported childhood physical abuse, 61% reported childhood sexual abuse, and 35% reported childhood physical neglect. Similarly, Battle et al. (2004) found that among 214 individuals diagnosed with BPD, a significant number reported histories of childhood physical abuse, sexual abuse, and physical neglect. Using descriptions of 524 adult patients diagnosed with personality disorders provided by a national sample of psychologists, Bradley, Jenei, and Westen (2005) found that history of abuse was significantly associated with diagnosis of BPD using multiple regression analysis.

While child maltreatment has repeatedly been implicated in both BPD and suicidality, fewer studies have examined the interrelationships of these three variables. Furthermore, those studies that have examined the roles of both child maltreatment and BPD in predicting suicidality have almost exclusively been cross-sectional in design and have focused on female samples, thereby limiting the conclusions that can be drawn from these studies. However, these studies suggest potential pathways for further research.

For example, Yen et al. (2004) studied 621 men and women between the ages of 18 and 45, who were taking part in the Collaborative Longitudinal Personality Disorders Study in order to assess the relationship between BPD and suicide attempts. Yen et al. divided BPD into three characteristics (impulsivity, affective instability, and identity disturbance) and found that impulsivity significantly predicted suicidal behaviors. Furthermore, while sexual abuse also predicted suicide attempts, MDD did not. In addition, these relationships remained even after they controlled for the parasuicidal behaviors that are characteristic of BPD, suggesting that the impulsivity associated with BPD is significantly contributing to suicidality in individuals with histories of childhood sexual abuse.

These results are consistent with those of Brodsky et al. (1997) who found that of the specific BPD characteristics, only impulsivity significantly predicted suicide attempts. These results remained significant after they controlled for lifetime major depression. Brodsky et al. theorized that the association of childhood maltreatment with suicidal behavior might be mediated by a causal relationship between abuse experiences and the development of impulsivity, which is then associated with suicidality in adulthood.

Soloff, Lynch, and Kelly (2002) examined whether childhood physical or sexual abuse increased the risk of suicidal behavior in adulthood. They were particularly interested in whether

child abuse increased certain risk factors for suicidal behavior, such as antisocial behavior and hopelessness. Among 61 participants meeting the diagnosis of BPD, Soloff et al. reported high base rates of suicidal behavior (83.6%) and childhood abuse (65.5%), with 28 patients reporting sexual abuse and 30 patients reporting physical abuse. Furthermore, they found that the odds of an abused patient attempting suicide were 10 times greater than that of a non-abused patient. Among the abused participants, the risk of adult suicidal behavior in BPD was increased by antisocial traits, severity of BPD, hopelessness, or comorbid MDD.

Paris (2005) has suggested that the unique combination of hopelessness and impulsivity that presents in BPD results in the severity of suicidal and self-harming behaviors seen in this diagnosis compared with other cluster B diagnoses. Although individuals diagnosed with ASPD also exhibit suicidal behaviors, these behaviors are often viewed as more impulsive than suicide attempts associated with BPD (Paris, 2005). Linehan (1993) has suggested that there is a unique pattern of impulsivity associated with BPD, which is not only characterized by impulsive suicidal behaviors, but which is influenced by extremely labile affective states. Based on this theory, BPD presents a particularly strong risk for suicide attempts and completed suicides due to a combination of impulsivity and hopelessness. However, it is important to note that Chapman, Specht, and Celluci (2005) found that the diagnosis of BPD continued to predict suicide attempts in a sample of 105 female inmates with histories of child abuse even after hopelessness was controlled for, suggesting that within this population of women, BPD-related impulsivity has a particularly strong relationship with suicidal behavior.

Few studies have examined the relationship between ASPD and suicidality. Those studies that have examined the role ASPD plays in suicidality have done so primarily through the study of psychopathy. A series of studies conducted by Verona and colleagues (Verona, Hicks,

& Patrick, 2005; Verona, Patrick, & Joiner, 2001) have found that the antisocial behavior component of psychopathy, particularly aggression, impulsivity, and antisocial behaviors, is related to suicide attempts, while the emotional and interpersonal components are not. Verona et al. (2001) first examined the relationship between antisocial behavior and suicide risk using a sample of 313 male inmates. Examining the emotional and behavioral components of the Psychopathy Checklist-Revised (PCL-R; Hare, 1991), the authors found that suicide risk was significantly related to items assessing the antisocial deviance characteristic of ASPD but not those items assessing the absence of emotion and empathy more characteristic of psychopathy. Furthermore, Verona et al. reported that variables similar to hopelessness and impulsivity (negative emotionality and low behavioral constraint) mediated the relationship between antisocial deviance and suicide attempts. Verona et al. (2005) replicated these results with a sample of female inmates.

Douglas, Herbozo, Poythress, Belfrage, and Edens (2006) reported a correlation between the impulsive aspects of antisocial deviance but no association with the emotional components of psychopathy when they studied 12 different inmate populations. Poythress, Skeem, and Lilienfeld (2006) found that self-reported child abuse was associated with the impulsivity typically characteristic of ASPD but not the lack of emotionality characteristic of psychopathy among a sample of male inmates. Taken together, these studies suggest that antisocial personality disorder rather than psychopathy is the relevant diagnosis for this area of research. However, these studies have been confined to cross-sectional and retrospective designs. Therefore, in order to better understand the relationship between ASPD and suicidality, longitudinal and prospective designs are needed.

Findings from Crawford, Cohen, and Brook's (2001) longitudinal community study

suggest that both male and female adolescents with cluster B personality symptoms continue to exhibit impulsive symptoms into adulthood. Whereas continuing psychopathology was predicted by externalizing symptoms for males, they found that females with continuing psychopathology were characterized by a combination of internalizing and externalizing symptoms. It is possible that this difference is related more to sex stereotyped diagnoses than a meaningful difference in symptomatology. Looking at sex differences in Axis I diagnoses, women are more likely to meet the diagnosis for a mood disorder (Weissman & Klerman, 1985), whereas men are more likely to be diagnosed with substance abuse (Robins & Reiger, 1991). However, these have been suggested to represent the parallel diagnostic categories for men and women (Horsfall, 2001). The life course for both BPD and ASPD is similar, suggesting that BPD (which diagnostically consists of both internalizing and externalizing symptoms) and ASPD (which diagnostically consists of externalizing symptoms) are parallel trajectories for men and women with similar adverse life circumstances (Paris, 2005). Both disorders are associated with childhood adversity, particularly child abuse and neglect, and both disorders tend to peak in young adulthood and then taper off with age (Paris, 1997, 2005). Considering that ASPD patients are approximately 80% male, while BPD patients are approximately 80% female (Paris, 2005), it is possible that these disorders are representing parallel externalizing pathways from child maltreatment to suicidality for men and women, whereas MDD and substance abuse represent the parallel Axis I pathways. More research is needed to determine whether these disorders are specific to the sexes, or whether they are simply representing sex-stereotyped categories of the same symptoms and behaviors. Examination of this issue will help improve understanding of the pathways to suicidality for men and women who experience maltreatment in childhood.

The Role of Race and Ethnicity

Sex differences in developmental reactions to child abuse and neglect may not sufficiently explain the relationship between child maltreatment and adult suicidality. Another factor to consider is the potential role of race and ethnicity. The majority of research on suicidality involves predominantly White samples (Gutierrez, Rodriguez, & Garcia, 2001). Even when minorities are included in studies, the racial/ethnic composition of the sample rarely comes close to approximating the racial composition of the population. Although research has suggested that Whites are more than twice as likely to commit suicide as Blacks (e.g., Early, 1992; Molock, Kimbrough, Lacy, McClure, & Williams, 1994; Hoyert, Kochanek, & Murphy, 1999), it is possible that these rates are influenced by sampling errors occurring when the proportion of Whites to Blacks in a research sample are not representative of the actual racial composition of the population.

On the other hand, the suicide rate for Blacks in the general community has consistently been lower than the rate for Whites (CDC, 2005; Vanderwerker, Chen, Charpentier, Paulk, Michalski, & Prigerson, 2007). While this data is not subject to the sampling problems of smaller research studies, the validity of such rates has been questioned in recent years (Vanderwerker et al., 2007). Researchers have produced several possible explanations for these findings: 1) Blacks have greater protective factors than Whites, which prevents suicide completions (Garlow, Purselle, & Heninger, 2005); 2) Risk factors for suicide are more relevant for Whites than Blacks (Vanderwerker et al., 2007); 3) Blacks are more likely to underreport suicidal ideation; and 4) Blacks and Whites do not differ in their rates of suicide, but Black suicides are more often miscategorized. Each of these potential explanations is discussed below.

Garlow et al. (2005) examined national suicide data for the years 1999 and 2000, in order

to compare completed suicides for Blacks and Whites. They found that Whites completed twice the number of suicides than Blacks, and that Blacks were significantly younger at the time of suicide than Whites. Garlow et al. expected that differences in the severity of cognitive disturbance, anxiety, and depression would explain the disparity in suicide rates. Instead they found that Blacks and Whites who completed suicides did not differ on these variables. In pointing out that Blacks in many parts of the country have more limited access to mental health treatment than Whites and that Blacks have been reported to find receiving psychiatric care for depression less acceptable than Whites, Garlow et al. noted that Blacks should be at a greater risk for completed suicides. They reasoned that, “[i]f suicide is considered to be an adverse outcome of untreated or inadequately treated psychiatric illness, then African Americans should be at greater risk than are Caucasians” (p. 322). However, their data refuted this conclusion. Despite the lower rates of psychiatric treatment among the Blacks in their study, they exhibited lower rates of completed suicides. In attempting to explain these results, Garlow et al. noted that cultural factors have been proposed to act as protective factors against suicide for Blacks. Specifically, religiosity, family support, and a “community-held attitude that suicide is unacceptable” (Garlow et al., 2005, p. 322) have been suggested to protect Blacks against suicide (Gibbs, 1997; Greening & Stoppelbein, 2002; Harris & Molock, 2000; Marion & Range, 2003; Nisbet, 1996). Orthodox religious beliefs and high rates of church attendance have been shown to act as particularly strong buffers against suicide among older Blacks (Garlow et al., 2005; Stack, 1998; Walker, Utsey, Bolden, & Williams, 2005). Family cohesion and support, as well as a tendency to seek support from friends and family have also been associated with protecting against suicide among Blacks (Garlow et al., 2005; Gibbs, 1988). Garlow et al. (2005) suggested that these protective factors are more prevalent in Blacks than Whites, particularly among older

Blacks. They noted that rates of suicide among Black adolescents have been increasing, and that their data support the notion that younger Blacks are at a greater risk for completed suicide than older Blacks. They concluded that protective factors, such as religiosity and family cohesion, are less relevant for younger generations of Blacks and that as the importance of these factors continues to decline within Black communities that suicide rates among Blacks will increase.

Joe (2006) examined birth cohort effects on the incidence of Black suicides between the years 1981 and 2002 and found support for Garlow et al.'s (2005) theory that declines in orthodox religious beliefs and strong family cohesion among younger generations of Blacks may help to explain the recent increase in suicide rates among Blacks. Joe (2006) found higher rates of completed suicides among Blacks born after 1958. This same time period has been associated with an increase in social stressors for Blacks, as well as a weakening of the role of church and family among Blacks (Joe, 2006; Wilson, 1996). Joe (2006) concluded that the disparity seen among White and Black suicide rates may be a cohort effect resulting from the strong sense of church and family that older Blacks still retain. Watt and Sharp (2002) examined suicide rates among Black and White adolescents and found that although Blacks reported more social stressors than Whites, Blacks who self-reported greater religiosity also endorsed less suicidal behavior than both their Black and White peers. Watt and Sharp concluded that religion acts as a protective factor for Black adolescents. Unlike Garlow et al. (2005) and Joe (2006), however, Watt and Sharp (2002) found that family and community supports did not affect rates of suicidal behavior among Blacks any more so than among Whites.

Research findings (e.g., Garlow et al., 2005; Joe, 2006; Watt & Sharp, 2002) lend some support to the idea that Blacks may be protected against suicide by factors such as religion but they do not adequately explain why these same factors would not act as protective factors for

Whites. In attempting to better explain the differences between suicidal behavior in Blacks and Whites, it has been suggested that Blacks are not better protected against suicide, but that the primary risk factors for suicide, including depression and substance abuse, only predispose Whites to suicidality. Vanderwerker et al. (2007) examined one of the primary risk factors for suicidality in 68 Black and 63 White patients, and found no significant differences in rates of major depressive disorder (MDD). However, diagnoses of MDD were associated with suicide attempts for White participants, but not associated with suicide attempts for Black participants. Vanderwerker et al. concluded that psychiatric diagnosis is not a significant predictor of suicidality in Blacks, and suggested that Blacks are less likely to commit suicide when faced with a mood disorders than Whites.

Castle, Duberstein, Meldrum, Conner, and Conwell (2004) utilized data gathered from the next-of-kin of 1,488 suicide decedents and 4,395 accidental decedents to assess whether psychiatric symptoms were differentially associated with suicide among Whites and Blacks. They found that both depression and substance abuse diagnoses significantly predicted suicidal behavior in Whites, but not in Blacks. Castle et al. also considered antisocial personality disorder (ASPD) and found that similar to depression and substance abuse, ASPD differentially predicted suicidal behavior in Whites and Blacks, such that high levels of antisocial behaviors predicted suicidal behavior in Whites but not Blacks. Blacks only appeared to be at an elevated risk for suicidal behavior when moderate levels of antisocial behaviors were reported. Castle et al. concluded that more research should examine the role of MDD, ASPD, and substance abuse in suicide among Blacks using stronger methodologies to help better understand the relation between these diagnoses and suicidality.

Rockett, Samora, and Coben (2006) considered another possible explanation for the

racial discrepancy: Data on Black suicides is not as complete as that for White suicides.

Drawing from gender research which suggests that female suicides are more often classified as accidental deaths than male suicides, Rockett et al. theorized that the same phenomenon might be occurring in classification of Black suicides compared to White suicides. Considering that Blacks experience many of the life stressors believed to predispose White individuals to suicidality (i.e., socioeconomic disadvantage, substance abuse, educational disadvantage), Rockett et al. suggested that Blacks may not be committing suicide less often, but their suicides may be more often misclassified as accidental deaths. In order to test this theory, they examined death classifications in the United States between 1992 and 2002, including suicides, deaths preceded by histories of intentional self-harm, unintentional poisoning and exposure to noxious substances, and unintentional drowning. They found that accidental deaths were often suspected suicides, but lacked sufficient evidence of intent to officially classify them as suicides. Reclassifying them as suicides and comparing the rates for Blacks and Whites, Rockett et al. found that the suicide gap significantly decreased. They concluded that Blacks, similar to White women, may be more likely to use less violent methods of suicide, such as poisoning and drowning, which may lead to a greater number of misclassifications as accidental deaths rather than suicides.

Considering that the rate of attempted suicide among Black adolescents has increased from 3.3% in 1991 to 7.5% in 2005 (Joe & Marcus, 2003), there is a need to better understand the role of race in suicide. Warshauer and Monk (1978) suggested that completed suicide is not the best measure of suicide risk in Blacks, due to evidence supporting an underreporting of completed suicides as suicides among Blacks. Suicide already has a low base-rate in the general population. Focusing suicidality research on completed suicides makes it difficult to explain the

inconsistencies found in studies examining discrepancies among Black and White suicide (Morrison & Downey, 2000).

Although most research examining racial differences in suicidality have focused on the use of psychological autopsy methodology, it has been suggested that using self-report methodologies does not produce more reliable evidence within the Black community (Morrison & Downey, 2000). Unfortunately, research suggests that Blacks underreport suicidal ideation and suicide attempts (Watt & Sharp, 2002). The low rate of self-disclosure may act to exacerbate research-based differences in the Black/White suicide rate, rather than to better explain the contributing factors.

Morrison and Downey (2000) suggest that a lack of self-disclosure of suicidal ideation among Blacks may contribute to the research data suggesting that Blacks have lower rates of suicidal ideation, attempts, and completions. Although little research has focused on suicidal ideation among Blacks (in part due to concerns over self-disclosure), Morrison and Downey posit that the general assumption that Blacks experience fewer suicidal ideation and attempts than Whites follows from the belief that Blacks have fewer completed suicides. However, as Morrison and Downey point out, “a high rate of completion is not always correlated with a high rate of ideation or attempts” (p. 377). Examining many of the theoretical explanations for suicide, one would expect Blacks to have a higher rate of suicidal ideation than Whites. Therefore, rather than discounting the theoretical underpinnings of suicidality research, it is necessary to consider other possible explanations, such as protective factors as suggested by Garlow et al. (2005). The recent increase in the rates of suicide completions and attempts for Blacks, suggests that the difference may not be in the suicide rates, but in the processes that lead to suicide (Watt & Sharp, 2002) or labeling the act suicide. Regardless of whether the disparity

is real or not, research examining risk factors for suicidality cannot afford to overlook the potential impact of the reporting disparities among Blacks and Whites.

Conclusion

Research examining the relationship between child maltreatment and suicidality is important for the development of adequate assessments of suicide risk and interventions within the abused and neglected population (Read, Agar, Barker-Collo, Davies, & Moskowitz, 2001). Suicidality is generally thought to reflect sex disparities, with men completing suicide more often than women, and women attempting suicide more often than men (Krug et al., 2002). Despite these differences, research on suicidality within the maltreated community has focused almost exclusively on females. Furthermore, researchers have only recently begun to explore the relation between externalizing symptoms and suicidal behaviors, placing primary focus on internalizing symptoms, such as depression (Angst et al., 1992; Apter et al., 1995; Beck et al., 1991).

Although recent research findings suggest that both maltreated males and females exhibit high rates of internalizing and externalizing symptoms (Hills et al., 2005; Verona et al., 2004), there is an absence of research examining whether these symptoms mediate the relationship between child maltreatment and adult suicidality. With the exception of Landry and Widom (2007), research examining the relationship between child maltreatment and suicidality has been limited to cross-sectional and retrospective designs.

To properly assess for suicide risk among the abuse and neglect population, it is important to understand how and why some maltreated individuals grow up to be suicidal, while others do not. This means gaining a better understanding of the complex relationship between child maltreatment and suicidality for both men and women. Furthermore, it is necessary to

understand potential differences between Whites and Blacks. One cannot assume that a Black child or adolescent is less at-risk for suicidality, when the research suggests that he or she may simply be less likely to self-disclose suicidal ideation (Morrison & Downey, 2000). Unless one understands these complex relationships, it will not be possible to assess the risk that an individual may pose for attempting, and/or completing suicide.

This study expands on earlier research by Landry and Widom (2007) in several ways: (1) The cohort of abused and neglected individuals and matched controls was followed into middle adulthood and re-interviewed at the approximate age of 40; (2) Suicidality was re-assessed during this second interview, such that information on suicidality is available for participants at approximately ages 29 and 40; (3) The four questions used to assess for suicidality at ages 29 and 40 will be factor analyzed to determine their relationship to suicidality; and (4) The role of psychiatric diagnosis (Major Depressive Disorder (MDD), Drug Abuse (DA), Antisocial Personality Disorder (ASPD), and Borderline Personality Disorder (BPD)) on the relationship between child maltreatment (sexual abuse, physical abuse, and neglect) and adult suicidality will be examined. Due to the fact that hopelessness and impulsivity were not defined and assessed for this dataset in comparable ways to those used in the suicidality literature, this dissertation will not explicitly address the roles of hopelessness or impulsivity in suicidality. Instead, diagnoses typically believed to be characterized by hopelessness and/or impulsivity will be examined.

This research has several advantages: (1) the use of a prospective longitudinal design to provide important information about the temporal sequence of the variables of interest; (2) examination of suicidality in middle adulthood, providing an important extension of knowledge about suicidality to a developmental stage rarely studied in this area; (3) the use of documented cases of child abuse and neglect minimizes the concern over the reliability of retrospective

reports used in prior research in this field; (4) the samples are diverse and consist of males and females and Blacks and Whites; and (5) this research examines the role of both internalizing and externalizing disorders to better understand how these disorders may contribute to adult suicidality.

HYPOTHESES

This dissertation has several major hypotheses:

(1) Children with documented histories of abuse and/or neglect will be at increased risk for suicidal ideation and suicidal behavior in middle adulthood in comparison with matched controls.

(2) It is hypothesized that individuals who experienced multiple forms of childhood maltreatment will have the highest risk of suicidality.

(3) Children who have documented histories of abuse and/or neglect will be at increased risk for lifetime diagnoses of major depressive disorder, drug abuse and/or dependence, antisocial personality disorder, and borderline personality disorder in comparison with matched controls.

(4) Diagnoses of major depressive disorder, drug abuse and/or dependence, antisocial personality disorder, and borderline personality disorder will mediate the relationship between child abuse and/or neglect and suicidality. That is, a diagnosis of major depressive disorder, drug abuse, antisocial personality disorder, or borderline personality disorder will, at least partially, explain the relationship between child abuse and/or neglect and adult suicidality.

(5) Alternatively, diagnoses of major depressive disorder, substance abuse, antisocial personality disorder, and borderline personality disorder will moderate the relationship between child abuse and/or neglect and suicidality, such that child abuse and/or neglect will interact with

each of these psychiatric diagnoses to increase the risk of suicidality.

(6) It is hypothesized that there will be sex differences in mediators between child abuse and neglect and suicidality, such that drug abuse and antisocial personality disorder will significantly mediate the relationship for males but not for females, while major depressive disorder and borderline personality disorder will mediate the relationship for females but not for males.

(7) It is also hypothesized that there will be sex differences in the moderators of the relationship between child abuse/neglect and suicidality, such that drug abuse and antisocial personality disorder will interact with child abuse and neglect to increase the risk of suicidality for males but not for females, while major depressive disorder and borderline personality disorder will interact with child abuse and neglect to increase the risk of suicidality for females but not for males.

(8) It is hypothesized that these relationships will apply to all three forms of childhood maltreatment included in this study (that is, physical abuse, sexual abuse, and neglect).

(9) It is hypothesized that these relationships will be significant even when race is controlled.

METHOD

Participants

The data used here are from a large research project based on a prospective cohort design study in which abused and/or neglected children were matched with non-victimized children and followed prospectively into adulthood. Because of the matching procedure, the subjects are assumed to differ only in the risk factor: that is, having experienced childhood abuse or neglect. Since it is not possible to randomly assign subjects to groups, the assumption of equivalency for

the groups is an approximation.

Cases were drawn from the records of county juvenile and adult criminal courts in a metropolitan area in the Midwest during the years 1967 through 1971. The rationale for identifying the abused and neglected group was that their cases were serious enough to come to the attention of the authorities. Only court-substantiated cases of child abuse and neglect were included. Abuse and neglect cases were restricted to those in which the children were younger than 11 years of age at the time of the abuse or neglect incident. Excluded from the sample were court cases that represented: (1) adoption of the child as an infant; (2) involuntary neglect only -- usually resulting from the temporary institutionalization of the legal guardian; (3) placement only; or (4) failure to pay child support.

Physical abuse cases included injuries such as bruises, welts, burns, abrasions, lacerations, wounds, cuts, bone and skull fractures, and other evidence of physical injury. Sexual abuse charges varied from relatively non-specific charges of "assault and battery with intent to gratify sexual desires" to more specific charges of "fondling or touching in an obscene manner," rape, sodomy, incest, and so forth. Neglect cases reflected a judgment that the parents' deficiencies in childcare were beyond those found acceptable by community and professional standards at the time. These cases represented extreme failure to provide adequate food, clothing, shelter, and medical attention to children.

A critical element of the design involved the selection of a comparison group, matched with the maltreated sample on the basis of age, sex, race/ethnicity, and approximate family social class during the time period under study. Matching for approximate family social class was important in this study because it is theoretically plausible that any relationship between child abuse and neglect and subsequent outcomes may be confounded with or explained by social class

differences (MacMillan, et al., 2001; Widom, 1989a). It is difficult to match exactly for social class because higher income families could live in lower social class neighborhoods and vice versa. The matching procedure used here is based on a broad definition of social class that includes neighborhoods in which children were reared and schools they attended. Similar procedures, with neighborhood school matches, have been used in studies of schizophrenics to match approximately for social class (Watt, 1972). The control group establishes the base rates of pathology to be expected in a sample of adults from comparable circumstances who did not come to court attention in childhood as victims of abuse or neglect. Where possible, two matches were found to allow for loss of comparison group members. Thus, individuals who were initially selected for the comparison group who were reported in the official abuse and neglect files were eliminated and replaced, where possible, with a second matched comparison subject. Any comparison group child with an official record of abuse or neglect was eliminated, regardless of whether the record was before or after the period of the study. This occurred in 11 cases.

Children who were under school age at the time of the abuse and/or neglect were matched with children of the same sex, race, date of birth (+/- 1 week), and hospital of birth through the use of county birth record information. For children of school age, records of more than 100 elementary schools for the same time period were used to find matches with children of the same sex, race, date of birth (+/- 6 months), class in elementary school during the years 1967 through 1971, and approximate home address. Overall, there were matches for 74% of the abused and neglected children.

Non-matches occurred for a number of reasons: (1) information about the date of birth was missing for the abused or neglected child; (2) the abused or neglected child was born outside the county and/or state; (3) the elementary school that the abused/neglected attended had closed

during the years since 1971 and class registers were not available; and (4) the school was not integrated at the time and a same race match could not be found.

Procedures

The initial phase of the research compared the abused and/or neglected children with the matched comparison group (N = 1,575) on juvenile and adult criminal arrest records (Widom, 1989b). The second phase involved tracking, locating, and interviewing the abused and/or neglected individuals and comparison group members a mean of 22.3 (SD = 2.1) years later. Two-hour in-person follow-up interviews were conducted, consisting of a series of structured and semistructured questions and rating scales, measures of IQ and reading ability, and a psychiatric assessment, with the National Institute of Mental Health, *Diagnostic Interview Schedule, Third Edition- Revised* (Robins, Helzer, Cottler, & Goldring, 1989). Of the original sample of 1,575, a total of 1,307 participants (83%) were located and 1,196 interviewed (76%) between 1989 and 1995. Of the people not interviewed, 43 were deceased (prior to interview), 8 were incapable of being interviewed, 268 were not found, and 60 refused to participate (a refusal rate of 3.8%). There were no significant differences between the interviewed follow-up sample (N = 1,196) and the original sample (N = 1,575) in terms of demographic characteristics (male, white, poverty in childhood census tract, or current age) or group status (abuse/neglect versus comparison group).

Of the 1,196 individuals interviewed between 1989 and 1995, 93% (N = 1,117) were located, and 896 (75%) were interviewed again between 2000 and 2002 (See Table 1). Of the people not interviewed, 37 were deceased, 4 were incapable of being interviewed, 79 were not found, and 180 refused to participate. Comparison of this sample (N = 896) to the earlier interview sample from 1989 to 1995 (1,196) indicated no significant differences in terms of race,

sex, abuse and/or neglect or mean current age. Four subjects were excluded from analyses because of missing data, resulting in sample size of 892.

The present sample includes 892 individuals (77 cases of physical abuse, 67 of sexual abuse, 403 cases of neglect, and 395 matched controls) whose mean age was 39.5 years ($SD = 3.51$, range 30-47). These numbers do not add up to 892 because some participants experienced multiple types of maltreatment. Approximately half the sample was women (51%; men, 49%). The sample was predominately Caucasian (60.8%) and African American (35.5%), although there were a small number of Hispanic/Latino (2.6%) and American Indian (1.9%) subjects. The total percentage exceeds 100% because individuals may be both Hispanic/Latino and Caucasian or African American. Only 27.7% of the sample had any college education, and 31.3% of the sample did not finish high school. The median occupational level for the group was semiskilled workers and only 11.3% of the subjects were in a profession. Thus, the sample is skewed toward the lower end of the socioeconomic spectrum.

Respondents were interviewed in person both times, typically in their homes, or, if the participant preferred, another place appropriate for the interview. The interviewers were blind to the purpose of the study, to the participants' group membership, and to the inclusion of an abused and/or neglected group. Similarly, the subjects were blind to the purpose of the study and were told they had been selected to participate as part of a large group of individuals who grew up in that area in the late 1960s and early 1970s. After a complete description of the study was provided to the subjects, subjects signed a consent form acknowledging that they were participating voluntarily. Institutional Review Board approval was obtained for the procedures involved in this study. For those individuals with limited reading ability, the consent form was read and, if necessary, explained verbally.

Variables and Measures

Independent Variables

Child abuse/neglect. Information regarding physical and sexual abuse and/or neglect in childhood was based on cases drawn from the records of county juvenile (family) and adult criminal courts in a metropolitan area in the Midwest during the years 1967-1971. Only court-substantiated cases of child abuse and neglect were included. Abuse and neglect cases were restricted to those in which the children were 11 years of age or younger at the time of the abuse or neglect incident. For the present analyses, child abuse/neglect cases were coded as “1” and controls were coded as “0.” Specific types of maltreatment were also used as separate independent variables, such that individuals with a history of sexual abuse, physical abuse, or neglect were examined separately in comparison with controls. Sexual abuse, physical abuse, and neglect cases were all coded as “1” and controls were coded as “0.” Multiple forms of maltreatment (i.e., history of more than one specific type of maltreatment) were coded as “1” and controls were coded as “0.”

Dependent Variable

Suicidality. Suicidality was assessed during the first and second interviews using four closed-ended questions, which were part of the depression module of the National Institute of Mental Health Diagnostic Interview Schedule – Revised (Robins et al., 1989). The present analyses utilize responses to these questions from the second interviews, between 2000 and 2002. Participants were asked: (1) “Has there ever been a period of two weeks or more when you thought a lot about death – (your own, someone else’s, or death in general)?”; (2) “Has there ever been a period of two weeks or more when you felt like you wanted to die?”; (3) “Have you ever felt so low you thought about committing suicide?”; and (4) “Have you ever attempted

suicide?”. The present analyses utilized responses to these four suicidality questions – thoughts of death, wish for death, suicidal thoughts, and suicide attempts -- were coded 1 for yes and 0 for no.

An earlier analysis (Landry & Widom, 2007) using the 1989-1995 data found that the first suicidality question, “Has there ever been a period of two weeks or more when you thought a lot about death – (your own, someone else’s, or death in general)?” did not significantly differentiate between individuals with histories of abuse/neglect and matched controls, while the other three suicidality questions did. A factor analysis was conducted to ascertain whether this question was significantly correlated with the other three suicidality questions using the 2000-2002 data (See Table 2). Factor analysis revealed that all four items correlated at least .3 with at least one other item, suggesting reasonable factorability. However, a closer examination of the correlations revealed that while thoughts of death correlated .35 with wish for death, it did not reach the threshold of a .3 correlation with either thoughts of suicide (.19) or suicide attempts (.29).

Two separate factor models were then tested. The first model included all four suicidality questions and in the second model, “thoughts of death” was removed. When the four suicidality variables were analyzed, the Kaiser-Meyer-Olkin measure of sampling adequacy was .68 with a significant Bartlett’s test of sphericity ($\chi^2(6) = 825.73, p < .001$). However, while the diagonals of the anti-image correlation matrix were all over .5, the communality of thoughts of death was .29, below the recommended value of .4. Using principle components analysis, eigenvalues indicated that using the four suicidality questions as one factor explained 55.19% of the variance. When thoughts of death was removed from the analysis, Kaiser-Meyer-Olkin measure of sampling adequacy increased to .76, above the recommended value of .6, and

Bartlett's test of sphericity was significant ($\chi^2(6) = 1323.13, p < .001$). The diagonals of the anti-image correlation matrix were all over .5, supporting the inclusion of each remaining remaining item in the factor analysis. Finally, the communalities were all above .4, further confirming that each of the remaining three questions shared some common variance with other questions. Given these overall indicators, factor analysis was conducted on the three remaining questions. Using principle components analysis, eigenvalues indicated that utilizing the three questions as one factor explained 68.32% of the variance.

Tamas et al. (2007) have suggested that thoughts of death are less closely related to suicidal behavior than previously thought. In accordance with existing clinical and research literature suggesting that recurrent thoughts of death represent a primary indicator of suicidal risk, along with suicidal ideation, suicidal plans, and suicide attempts, Tamas et al. examined the emotional regulation of non-suicidal adolescents and adolescents endorsing one or more of the four forms of suicidal behavior. While they found that individuals endorsing suicidal ideation, suicidal plans, and suicide attempts all exhibited emotional dysregulation in comparison to non-suicidal individuals, they found that non-suicidal individuals and individuals endorsing thoughts of death exhibited little difference on measures of emotional regulation. Tamas et al. focused their research on an adolescent population rather than middle adulthood. However, based on the work of Tamas et al., it seems reasonable to conclude that thoughts of death are not as representative of suicidal behavior as previously thought. This is particularly likely for the current cases considering that most research examining thoughts of death focus on recurrent thoughts of one's own death, whereas the question utilized in the present research includes thoughts not only of one's own death but also of others' deaths. Therefore, in light of the Tamas et al., findings in combination with the results of the present factor analyses and the previous

findings of Landry and Widom (2007), responses to “thoughts of death” were excluded from further analyses. The remaining three variables were combined into one outcome variable of suicidality, in which a positive response to one or more of the three questions was coded as “1” for the presence of suicidality and a negative response to all three questions was coded as “0” for the absence of suicidality.

Potential Mediators and Moderators

Lifetime prevalence of psychiatric diagnoses. At the first follow-up interview (at approximately age 29) between 1989-1995, the DIS-III-R (Robins et al., 1989) was used to assess major depressive disorder (MDD), drug abuse and/or dependence (DA), and antisocial personality disorder (ASPD). The DIS-III-R is a fully structured interview schedule designed for use by lay interviewers. The interviewers were highly trained individuals, experienced in the administration of the DIS, who were supervised by the survey company and project staff. The interviewers received an intensive week of training and were carefully supervised. At the end of training, interviewers were required to conduct a full interview with a community volunteer, which was observed and critiqued by a member of the research staff. Computer programs for scoring the DIS-III-R were used to compute *DSM-III-R* diagnoses. The DIS has been used in prior community-based studies of psychiatric disorders, and adequate reliability and validity have been reported (Leaf, Myers, & McEvoy, 1991).

Borderline personality disorder (BPD) was assessed during the second follow-up interview (at approximately age 40) during 2000-2002 (see Widom, Czaja, & Paris, 2009). Due to the fact that BPD was assessed at the same time as the outcome variable (suicidality) it cannot technically be considered a mediator. However, because of the theoretical importance of BPD in the literature, it is included in the present research and the results are discussed as suggestive in

nature with the caveats about the timing of the data collection mentioned throughout.

BPD was assessed with a structured interview (Jordan, Schlenger, Fairbank, & Caddell, 1996) based on DSM-III-R criteria (American Psychiatric Association, 1987) and adapted from the BPD module of the Diagnostic Interview for Personality Disorders, Revised (DIPD-R) (Zanarini, Frankenburg, & Chauncey, 1987). Participants received a diagnosis of BPD if they met at least five of the criteria for BPD, consistent with DSM-III-R and Jordan et al. (1996). The instrument assessed current (past year) BPD.

Validity for the BPD structured interview has been shown in a study of incarcerated women (Jordan et al., 1996). Jordan and colleagues used a 2-stage study design, with an initial interview conducted by professional survey interviewers, then re-interview by mental health clinicians using the Diagnostic Interview for Borderlines, Revised (DIB-R) (Gunderson, Kolb, & Austin, 1981). Good correspondence was reported between the survey interview BPD diagnosis and clinicians' assessments of BPD (sensitivity 77% and specificity 81%).

Due to the fact that the original diagnostic variable for BPD included two questions addressing suicidal ideation and suicide attempts, these questions were removed from the diagnosis to avoid confounding our results. Therefore, a diagnosis of BPD was determined to be present if subjects met five or more diagnostic criteria, including self-harm behaviors but excluding suicidal thoughts and/or behaviors.

Demographic Variables. Participant sex, race, and age were documented at each interview. For the purposes of this research, sex was coded "0" for males and "1" for females. Race was coded "0" for Black, non-Hispanic and "1" for White, non-Hispanic. Hispanic and Native Americans were excluded from these analyses resulting in a sample size of 832 for analyses including race. Age was included as a continuous variable.

Statistical Analysis

The significance of the association between child maltreatment and suicidality was assessed using logistic regression analysis. Strength of the association was determined by odds ratios (OR) with 95% confidence intervals (CI). After determining whether a significant relationship existed between child abuse/neglect and suicidality, analyses were conducted for each of the hypothesized mediators (MDD, DA, ASPD, and BPD) separately¹, using the guidelines established by Kenny, Kashy, and Bolger (1998). According to Kenny et al. (1998), four conditions must be met to demonstrate mediation: (1) child abuse/neglect (the independent variable) should significantly predict suicidality (the dependent variable); (2) child abuse/neglect should significantly predict the mediators (MDD, DA, ASPD, and BPD); (3) the mediators must significantly predict suicidality, while controlling for child abuse and/or neglect; and (4) the effect of child abuse/neglect on suicidality must be reduced when the mediators are included in the model. If the odds ratio (OR) for the independent variable (child abuse/neglect) predicting the dependent variable (suicidality) was attenuated to non-significance, then the potential mediator variable was interpreted as fully mediating the association between child abuse/neglect and suicidality. If the OR for the independent variable remained statistically significant, but was substantially attenuated (a 10% or greater reduction), then the potential mediator variable was considered to be a partial mediator (Koenen & Widom, 2009; Rothman, 2002). These analyses were repeated to test for mediator relationships by type of child maltreatment experience (sexual abuse, physical abuse, neglect, and multiple forms of maltreatment).

¹ Originally, in addition to univariate logistic regressions, the intention was to conduct a comprehensive path analysis to examine the model including all of the hypothesized mediators. However, the results of univariate tests indicated that several of the relationships necessary for mediation were not supported. Additionally, BPD could not be treated as a mediator in the comprehensive path analysis because of its assessment at the same time as the outcome variable. Therefore, a decision was made to exclude a comprehensive path analysis from this dissertation, although the results of limited path analyses with MDD and ASPD as potential mediators are provided in Appendix B.

To test for moderation, four interaction terms were created representing interactions between child abuse/neglect and the four psychiatric diagnoses (MDD, DA, ASPD, and BPD). The interaction terms were entered into logistic regression analyses to test whether childhood abuse and neglect interacted with psychiatric diagnoses to predict suicidality. Similarly, interaction terms were created representing the interactions between individual forms of child maltreatment and the psychiatric diagnoses to determine whether the four diagnoses significantly interact with each form of maltreatment to affect suicidality. No significant interactions were found between any of the types of maltreatment and the diagnoses on suicidality. Therefore, the moderation hypotheses were dropped from further analyses.

After completing the mediation and moderation analyses for abuse/neglect, analyses were then conducted to test hypotheses about the role of potential mediators in the relationship between abuse/neglect and suicidality for males and females. Interaction terms were created (child abuse/neglect x sex) to explain potential sex differences in these relationships for each of the dependent and mediator variables. Separate logistic regressions were then conducted to examine the different patterns of results for the suicidality variables, psychiatric diagnoses, and the mediation models for males and females separately. Similar to the analyses for sex, moderation analyses were also undertaken for Blacks and Whites separately.

Results

The first section of the results presents findings for the relationship between child abuse/neglect and suicidality in middle adulthood, as well as the results for specific types of maltreatment, and for sex and race. The next section addresses findings concerning the role of the potential mediating variables of MDD, DA, ASPD, and BPD in the relationship between child abuse/neglect and suicidality. The third section reports the results of the models containing

both abuse/neglect (and specific types of maltreatment) and the potential mediators on suicidality. The moderation hypotheses are addressed in the final section.

Child Abuse/Neglect and Suicidality

Table 3 presents the prevalence of suicidality by abuse/neglect overall, type of abuse/neglect, by sex, and by race. Overall, results indicate that individuals with documented histories of abuse/neglect were at significantly greater risk for suicidality in middle adulthood than matched controls (OR = 1.67, 95% CI [1.26, 2.21], $p < .001$). When specific types of maltreatment were considered, the results indicated that sexual abuse, physical abuse, and neglect, as well as multiple forms of maltreatment, all individually increased risk for suicidality (OR = 1.93, 95% CI [1.14, 3.26], $p = .014$; OR = 2.07, 95% CI [1.26, 3.40], $p = .004$; OR = 1.60, 95% CI [1.20, 2.14], $p = .002$; OR = 2.06, 95% CI [1.14, 3.74], $p = .017$, respectively). While all types of maltreatment examined were associated with increased risk for suicidality, physically abused individuals and individuals experiencing multiple forms of maltreatment appeared to be at particular risk with both types more than twice as likely as controls to report suicidality in middle adulthood.

In order to determine whether sex or race moderated the relationship between child abuse and neglect and risk for suicidality, interactions for sex x child abuse/neglect and race x abuse/neglect on suicidality were tested. The results of these analyses indicated that there were significant interactions for child abuse/neglect x sex (OR = 1.62, 95% CI [1.21, 2.18], $p = .001$) and child abuse/neglect x race (OR = 1.94, 95% CI [1.45, 2.59], $p < .001$). Subsequent analyses examined the relationships between child maltreatment and suicidality separately for males and females and Blacks and Whites. Similar to the findings for the overall abuse/neglect group, both abused/neglected males and females were at increased risk for suicidality (see Table 3).

However, a sex difference appeared in the analysis of type of child abuse/neglect. Whereas all types of maltreatment increased risk for suicidality in females, none of the specific types of maltreatment increased risk for suicidality in males.

When separate analyses were completed for Blacks and Whites, the results indicated that only Whites with histories of abuse/neglect in general and sexual abuse and neglect in particular were at increased risk for suicidality when compared to control Whites (see Table 3). Maltreated Blacks did not exhibit a significantly greater risk for suicidality than control Blacks.

Potential Mediators and Suicidality

For the mediation analyses, the first step was to examine whether child abuse/neglect was associated with the potential mediators (MDD, DA, and ASPD). These analyses were also repeated with BPD as a potential mediator, with the understanding that these are suggestive only and do not have the same strength or temporal appropriateness as the other mediators. The percentage of abused and/or neglected individuals and controls who met diagnostic criteria for MDD, DA, ASPD, or BPD during their lifetimes, along with ORs, 95% CIs, and significance levels are presented in Table 4.

Abused/neglected individuals were more likely to meet lifetime diagnoses of MDD (OR = 1.66, 95% CI [1.21, 2.28], $p = .002$), ASPD (OR = 1.89, 95% CI [1.27, 2.81], $p = .002$), and BPD (OR = 1.59, 95% CI [1.04, 2.44], $p = .034$), whereas child abuse/neglect was not significantly associated with DA (OR = 1.11, 95% CI [.84, 1.46], $p = .463$). Therefore, DA was excluded from further analyses.

The first step in determining whether both males and females and Blacks and Whites were at increased risk for MDD, ASPD, and BPD involved examining the interactions between sex x child abuse/neglect for the diagnoses. Interaction analyses indicated that there were

significant interactions between sex x abuse/neglect on MDD (OR = 2.12, 95% CI [1.54, 2.92], $p < .001$) and ASPD (OR = 1.64, 95% CI [1.00, 2.61], $p = .031$) but not BPD (OR = 1.18, 95% CI [.76, 1.83], $p = .455$). There were also significant interactions between race x abuse/neglect for MDD (OR = 1.77, 95% CI [1.28, 2.44], $p = .001$) and ASPD (OR = 1.69, 95% CI [1.14, 2.52], $p = .010$) but not BPD (OR = 1.27, 95% CI [.83, 1.96], $p = .275$). Therefore, differences between the sexes and races on mediation analyses can be interpreted as sex differences for MDD and ASPD, but findings using BPD should be interpreted as within group differences. When males and females were examined separately, the results indicated that abused/neglected females were more likely to meet lifetime diagnosis of MDD (OR = 1.72, 95% CI [1.13, 2.61], $p = .011$) but not BPD or ASPD, while abused/neglected males were more likely to meet lifetime diagnosis of BPD (OR = 2.31, 95% CI [1.20, 4.43], $p = .012$) but not ASPD or MDD. Additionally, the results revealed that child abuse/neglect was significantly associated with MDD and ASPD for Whites, but not significantly related to any of the diagnoses for Blacks.

The next step was to determine whether the specific types of maltreatment were associated with MDD, ASPD, and BPD. The results indicated that for physically abused individuals and individuals experiencing multiple forms of maltreatment, the risk for meeting lifetime diagnoses of MDD or BPD was more than twice that of controls (OR = 2.28, 95% CI [1.34, 3.87], $p = .002$; OR = 2.22, 95% CI [1.13, 4.34], $p = .02$; OR = 1.67, 95% CI [1.20, 2.32], $p = .002$; OR = 1.58, 95% CI [1.01, 2.47], $p = .02$). Neglect also increased risk for MDD and BPD, as well as ASPD (OR = 1.67, 95% CI [1.36, 4.72], $p = .001$; OR 1.58, 95% CI [1.01, 2.47], $p = .02$; OR = 2.04, 95% CI [1.36, 3.07], $p = .001$, respectively). Contrary to the literature linking child sexual abuse and psychiatric disorders, the results for this sample indicated that sexual abuse was not significantly related to lifetime diagnoses of MDD, ASPD, or BPD.

Looking at males and females separately, the results indicated that females who experienced physical abuse, neglect, and multiple forms of maltreatment were at increased risk for MDD compared to control females, whereas none of the types of maltreated males were at increased risk for MDD. In contrast, males with histories of physical abuse, neglect, and multiple forms of maltreatment were at increased risk for BPD, but maltreated females were not. ASPD was not associated with any of the particular types of maltreatment for males, but was significantly associated with child sexual abuse in females (OR = 2.76, 95% CI [1.05, 7.24], $p = .001$).

The results also indicated that Whites with histories of physical abuse, neglect, and multiple forms of maltreatment were at increased risk for MDD, while Whites with histories of neglect and multiple forms of maltreatment were at increased risk for ASPD. Among Whites, child sexual abuse was not associated with any of the psychiatric diagnoses assessed here. None of the specific types of maltreatment was associated with any of these diagnoses for Blacks. Due to these non-significant findings for Blacks, it was not possible to conduct mediation analyses and Blacks were excluded from further analyses.

The next step of the analysis was to test whether the psychiatric diagnoses associated with child abuse and/or neglect ($p < .05$) were also associated with increased risk for suicidality in middle adulthood. Thus far, the results of these analyses indicate that abused/neglected individuals have a higher prevalence than controls of MDD, ASPD, and BPD; abused/neglected females have a higher prevalence of MDD; abused/neglected males have a higher prevalence of ASPD and BPD; and abused/neglected Whites have a higher prevalence of MDD and ASPD. Therefore, the next step in these analyses was to examine whether these diagnoses were also associated with suicidality. Table 5 presents the prevalence of suicidality among individuals

meeting the diagnoses of MDD, ASPD, and BPD with child abuse/neglect (and the specific types of maltreatment) controlled. The results indicate that all three diagnoses (MDD, ASPD, and BPD) were significantly associated with suicidality.

Child Abuse/Neglect, Potential Mediators, and Suicidality

Thus far, the analyses presented have focused on associations between child abuse/neglect and suicidality and child abuse/neglect and potentially mediating psychiatric diagnoses. Documenting associations between child abuse/neglect and both the diagnoses and suicidality was a prerequisite for considering whether they explain the relationship between child abuse/neglect and suicidality in middle adulthood. Child abuse/neglect was found to be associated with suicidality, as well as MDD, ASPD, and BPD. Furthermore, MDD, ASPD, and BPD were all significantly associated with suicidality when abuse/neglect was controlled. Therefore, the final stage of these analyses was to test whether the association between child abuse/neglect and suicidality was substantially attenuated (10% or more) after adjusting for MDD, ASPD, and BPD. These analyses were also completed for physical abuse, neglect, and multiple forms of maltreatment. Sexual abuse was not considered in this final stage of these overall analyses because it was not significantly associated with any of the diagnoses. Sexual abuse was significantly associated with ASPD for females and, accordingly, will be included in the final step of analyses for females.

Table 6 presents the results of the hierarchical logistic regression analyses where each psychiatric diagnosis was examined in separate equations. The addition of MDD to the model between child abuse/neglect and suicidality resulted in a reduction of the OR from 1.67 to 1.51, which represents a reduction of 16%. This result indicated that MDD partially mediated the association between abuse/neglect and suicidality. The inclusion of ASPD to the model did not

meet the criteria of 10% attenuation. Neither did the inclusion of BPD. These results indicated that neither of these diagnoses mediated the association between abuse/neglect and suicidality.

When the specific types of child maltreatment were considered, results indicated that ASPD partially mediated the relationship between neglect and suicidality (10% attenuation). The addition of MDD to the model for physical abuse and suicidality resulted in a reduction of the OR from 2.07 to 1.71, and the addition of BPD to the model for physical abuse and suicidality resulted in a reduction of the OR from 2.07 to 1.84. These represent reductions of 36% and 23% for MDD and BPD respectively. Therefore, MDD and BPD each separately resulted in substantial attenuation of the effect of physical abuse on suicidality, indicating that MDD is acting as a partial mediator and suggesting that BPD may also be a partial mediator of the relationship between child physical abuse and suicidality. Furthermore, the addition of MDD to the model for multiple forms of maltreatment and suicidality resulted in full mediation of the association between multiple forms of maltreatment and suicidality. The addition of BPD to the model for multiple forms of maltreatment and suicidality also suggested mediation. The addition of MDD resulted in a reduction of the OR from 2.06 to 1.71, a 36% reduction, and a non-significant $p = .093$. The addition of BPD produced a reduction of the OR from 2.06 to 1.76, a 30% reduction, and a non-significant $p = .085$. Therefore, while ASPD partially mediated the relationship for neglect and suicidality, MDD partially mediated the relationship for physical abuse and suicidality and fully mediated the relationship for multiple forms of maltreatment and suicidality. Furthermore, although only suggestive, these findings indicate that BPD may play an important role as a mediator between childhood physical abuse and the experience of multiple forms of maltreatment and suicidality.

The next set of analyses examined whether the mediators between child abuse and neglect and suicidality differed for males and females. For females, MDD partially mediated the relationship between abuse/neglect and suicidality (unadjusted OR = 1.82, adjusted OR = 1.63, 19% attenuation) and neglect and suicidality (unadjusted OR = 1.81, adjusted OR = 1.63, 18% attenuation) and fully mediated the association between physical abuse and suicidality (unadjusted OR = 2.40, adjusted OR = 1.81, 59% attenuation, $p = .12$). In contrast, MDD was not a mediator variable for males. However, ASPD fully mediated the relationship between abuse/neglect and suicidality for males (unadjusted OR = 1.51, adjusted OR = 1.40, $p = .107$). The results for BPD suggest that it may also mediate the relationship between abuse/neglect and suicidality for males (adjusted OR = 1.51, $p = .168$). ASPD partially mediated the relationship between sexual abuse and suicidality for females (unadjusted OR = 2.02, adjusted OR = 1.86, 16% attenuation). In sum, MDD acted as a mediator between child abuse/neglect and suicidality only for females, BPD appears to act as a mediator between child abuse/neglect and suicidality for males, and ASPD was a mediator for both abused/neglected males and sexually abused females.

In terms of race, MDD was the only significant mediator between child abuse/neglect and suicidality for Whites. That is, MDD partially mediated the relationship between child abuse/neglect and suicidality and child neglect and suicidality (both 23% attenuations) for Whites only. No other mediating effects were found.

Interactions Between Child Abuse/Neglect and Psychiatric Diagnoses on Suicidality

In order to determine whether child abuse/neglect interacted with MDD, DA, ASPD, and BPD to increase risk for suicidality, interaction terms were created between child abuse/neglect

and each of the four diagnoses. Results revealed no significant interactions between child abuse/neglect and any of the psychiatric diagnoses on suicidality in middle adulthood.

Discussion

This prospective study has provided additional support for the link between child abuse/neglect and adult suicidality. The results demonstrate that abused and/or neglected children are approximately two times more likely than their non-maltreated counterparts to report suicidality as adults. This finding was replicated for physical and sexual abuse, neglect, and multiple forms of maltreatment, indicating that all types of child maltreatment assessed here elevate risk for suicidality in middle adulthood. Physical abuse and multiple forms of maltreatment increased risk for suicidality more than twofold, suggesting that these forms of maltreatment placed individuals at particular risk for suicidality in middle adulthood.

These findings are important not only because they extend our knowledge of the link between child abuse/neglect and suicidality beyond the adolescent and early adult years into middle adulthood, but also because they provide insight into the effects of neglect and multiple forms of maltreatment as well as physical and sexual abuse. Previous research has focused almost exclusively on the link between physical and sexual abuse and suicidality, but these findings emphasize the importance of considering suicide risk among both neglected individuals and those who have experienced multiple forms of maltreatment in childhood. Child neglect has received limited attention in the research community despite recent evidence that it is implicated in negative long-term consequences for children (e.g., Lau et al., 2005; Manly, 2005). Child neglect has recently been implicated as a risk factor for major depression (Widom, DuMont, & Czaja, 2007), but neglect continues to receive little attention in suicidality research (Gladstone & Beardslee, 2009). Considering that neglect represents almost two-thirds of the reported and

substantiated cases of child maltreatment in the United States (Administration for Children, Youth, and Families, 2009), it is vital that the research community pays more attention to these children. It has become fairly common among child maltreatment research to consider neglect as comorbid to other forms of maltreatment (e.g., Briere & Runtz, 1990; Kinard, 1994; Silverman, Reinherz, & Giaconia, 1996), and relatively rare to focus on the independent effects of child neglect on long-term psychological outcomes of maltreated children (Dubowitz, 1999; Dubowitz, Pitts, Litrownik, Cox, Runyan, & Black, 2005; Lau et al., 2005; Manly, 2005). The high incidence of child neglect in this country suggests that more research is needed to examine the independent effect of neglect on long-term consequences of child maltreatment.

Researchers have repeatedly suggested that individuals with histories of multiple forms of maltreatment are at greater risk for poor psychiatric outcomes in adulthood than individuals who experience single forms of maltreatment (Brown & Anderson, 1991; Brezo et al., 2008; Clemmons et al., 2007; English et al., 2005; Joyce et al., 2003; Lau et al., 2005; Rossman et al., 1998; Schaaf & McCanne, 1998). In fact, one of the common limitations noted in child maltreatment research has been the failure to consider the presence of comorbid types of maltreatment among participants (Lau et al., 2005; Manly, 2005). Researchers commonly classify participants based on one or two subtypes of maltreatment while overlooking the potential impact of unidentified comorbid maltreatment experiences. In recognizing this shortfall, researchers have recently suggested that to understand the effects of child maltreatment both the specific subtypes as well as any comorbidities must be considered (e.g., Lau et al., 2005; Manly, 2005). Yet despite this, little research has specifically examined suicide risk among individuals with histories of multiple forms of maltreatment. The present findings strongly suggest that suicidality research should begin to focus attention beyond sexual and physical

abuse to the effects of neglect and multiple forms of maltreatment.

As expected, individuals with histories of child abuse/neglect were also at an increased risk for lifetime diagnoses of MDD, ASPD, and BPD. However, unexpectedly, they were not at an increased risk for substance abuse and/or dependence. Research has repeatedly reported a relationship between child maltreatment and substance abuse (e.g., Brown & Anderson, 1991; Galaif, Stein, Newcomb, & Bernstein, 2001; Hatzichristou & Papadatos, 1993; Hussey & Singer, 1993; Hussey, Strom, & Singer, 1992), but these results have all been the result of cross-sectional studies. Furthermore, these results have not been unequivocal, with several studies reporting no increase in substance abuse associated with child maltreatment (Goldston, Turnquist, & Knutson, 1989; Harrison, Hoffmann, & Edwall, 1989; Widom, Weiler, & Cottler, 1999). Widom et al. (1999) found that abused/neglected individuals were not at increased risk of lifetime diagnosis of substance abuse and/or dependence in comparison with matched controls at approximately age 29. Widom, Marmorstein, and White (2006) then examined the relationship between child abuse/neglect and lifetime substance abuse among participants at approximately 40 years of age, and again found that child abuse/neglect was not associated with increased risk for lifetime diagnosis of substance abuse, but was associated with current substance abuse. For reasons not yet completely understood, it appears that lifetime diagnosis of substance abuse does not significantly distinguish between abused/neglected individuals and matched controls within this sample at either age 29 or 40. Consistent with suicidality research, lifetime diagnosis of substance abuse was significantly associated with suicidality when child abuse/neglect was controlled, but the results of this study suggest that substance abuse does not explain the relationship between child maltreatment and adult suicidality within this sample.

While MDD, ASPD, and BPD were all associated with child abuse/neglect, some

unexpected results were discovered when the specific types of maltreatment were examined. Physical abuse, neglect, and experiencing multiple forms of child maltreatment were all associated with MDD and BPD, but neither physical abuse nor experiencing multiple forms of maltreatment were significantly related to lifetime diagnosis of ASPD. These results are inconsistent with cross-sectional findings indicating that physical abuse is associated with ASPD (Bierer et al., 2003; Cuneyt, Kural, & Erkiran, 2006; Semiz, Basoglu, Ebrinc, & Cetin, 2007), as well as other research suggesting that multiple forms of maltreatment place individuals at significant risk for lifetime psychopathology (Brown & Anderson, 1991; Brezo et al., 2008; Clemmons et al., 2007; English et al., 2005; Joyce et al., 2003; Lau et al., 2005; Rossman et al., 1998; Schaaf & McCanne, 1998).

Furthermore, despite ample research findings linking child sexual abuse with increased risk for psychiatric diagnosis (e.g., Finkelhor, 1997; Gidyez, Coble, Latham, & Layman, 1993; Johnson, Cohen, Gould, Kasen, Brown, & Brook, 2002; Paolucci, Genuis, & Violato, 2001; Polusny & Follete, 1995; Swanston, Plunkett, O'Toole, Shrimpton, Parkinson, & Oates, 2003), sexual abuse was not significantly associated with any of the diagnoses examined within this study. Some researchers have suggested that the long-term psychological outcomes of sexually abused children are particularly sensitive to factors such as the relationship between the abuser and child (e.g., Banyard & Williams, 1996; Black, Dubowitz, & Harrington, 1994; Browne & Finkelhor, 1986; Senn, Carey, Venable, Coury-Doniger, & Urban, 2007; Wagner, 1991) or whether physical force was involved (Friedrich, Urquiza, & Beilke, 1986; Gomes-Schwartz, Horowitz, & Cardelli, 1990; Jonzon & Lindblad, 2006; Leahy, Pretty, & Tenenbaum, 2004; Senn et al., 2007). Furthermore, researchers have suggested that some of the apparent psychiatric consequences of child sexual abuse may actually be accounted for by the presence of other risk

factors (Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008; Bornovalova, Gratz, Delany-Brumsey, Paulson, & Lejuez, 2006; Nash, Hulsey, Sexton, Harralson, & Lambert, 1993; Paris, 1997). For example, Gratz (2009) found that child sexual abuse no longer predicted BPD diagnosis when emotional abuse was controlled.

Widom et al., (2009) also found that individuals with a history of child sexual abuse were not at increased risk for BPD compared with matched controls. In attempting to reconcile these results with other studies finding a link, they reasoned that the use of court-documented cases may have resulted in a different type of subject pool than the cases typically used that often report minor or single incidents of sexual abuse (Widom et al., 2009; Paris, Zweig-Frank, & Guzder, 1994). Furthermore, it is possible that other design factors, such as the use of a prospective longitudinal design, as opposed to the more common cross-sectional and retrospective design has impacted these results. It is also important to note that the sample size of sexual abuse cases was relatively small. However, it seems unlikely that the lack of significant relationships was the result of limited power due to the significant results found for multiple forms of maltreatment, which also was smaller in comparison with the other groups.

Previous research has repeatedly linked MDD with suicide risk in both adolescence and adulthood. Severity, recurrence, and chronicity of major depressive episodes have all been associated with both non-fatal and fatal suicidal behavior and suicidal ideation (e.g., Kessing, 2004; Merikangas, Wiki, & Angst, 1994; Oquendo, Currier, & Mann, 2006; Szadoczky, Fazekas, Rihmer, & Arato, 1994; Witte, Timmons, Fink, Smith, & Joiner, 2008). Research examining the association between child maltreatment and suicidality has also placed considerable emphasis on MDD (e.g., Angst et al., 1992; Apter et al., 1995; Brown et al., 1999; McHolm et al., 2003). Consistent with such previous research, MDD partially explained the relationship between child

abuse/neglect and suicidality, as well as for physical abuse, neglect, and multiple forms of maltreatment, suggesting that MDD remains an important suicide risk factor to consider within the maltreatment population.

In contrast to hypothesized relationships and recent research, neither ASPD nor BPD (with the caveats noted earlier about the limitations of the BPD assessment) mediated the relationship between child abuse/neglect and suicidality. This was unexpected based on the findings that individuals with histories of abuse/neglect were at increased risk for both ASPD and BPD in comparison with matched controls, as well as recent research indicating a link between child maltreatment, Cluster B personality disorders and suicidality (Battle et al., 2004; Grilo et al., 1999; Hills et al., 2005; Verona & Sacks-Ericsson, 2005). Results did indicate, however, that ASPD partially mediated the relationship between child neglect and suicidality, and suggested that BPD also plays a mediating role for both physical abuse and suicidality and multiple forms of maltreatment and suicidality. Therefore, it is possible that the roles of externalizing disorders are specific to type of maltreatment. Based on these findings, it appears that the overwhelming focus on sexual abuse within the research community needs to make room for more attention on physical abuse, neglect, and multiple forms of maltreatment when assessing suicide risk.

These results indicated sex differences within suicide risk and paths to suicide for men and women, suggesting the importance of considering sex differences in suicide risk not only within the general population, but also within the maltreatment population. Findings for women were particularly clear- women with histories of child abuse/neglect, physical abuse, sexual abuse, neglect, and multiple forms of maltreatment are all at increased risk for suicidality in middle adulthood. With the exception of women with histories of sexual abuse, they were also at

elevated risk for lifetime diagnosis of MDD, which mediated the relationships between their maltreatment histories and suicidality. Inconsistent with expectations, none of the types of maltreatment increased risk for BPD among female participants. This is particularly surprising when we consider the strong association previous research has found between child sexual abuse and BPD for women (Herman et al., 1989; Ogata et al., 1990; Paris et al., 1994; Shearer, Peters, Quaytman, & Ogden, 1990; Silk, Lee, Hill, & Lohr, 1995; Westen et al., 1990; Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989). Also inconsistent with expectations, sexually abused women were at increased risk for ASPD but not MDD, and ASPD partially mediated the relationship between sexual abuse and suicidality for females. This finding does lend support to cross-sectional results from Verona et al. (2005) that self-reported child sexual abuse was associated with both antisocial personality traits and suicide attempts in a female prison population. This highlights the importance of extending our research focus beyond the relationship between sexual abuse and BPD to the relationship between sexual abuse and ASPD for females. These results suggest that unlike their other maltreated peers, sexually abused females are more at risk for externalizing symptoms in the form of antisocial personality than depressive symptoms. Little research has examined the relationship between child sexual abuse and ASPD among females, but these results highlight the need to further examine this relationship.

Unlike females, in males, only overall abuse/neglect predicted increased risk for suicidality, whereas none of the specific types of maltreatment differentiated suicidality risk for males. Furthermore, males presented with a more externalizing picture, with ASPD mediating the relationship between child abuse/neglect and suicidality. These findings also suggested that BPD played a potentially mediating role in the relationship between child abuse/neglect and

suicidality. Having a history of child abuse/neglect, physical abuse, neglect, and multiple forms of maltreatment all elevated risk for BPD in males, whereas child abuse/neglect and neglect both increased risk for ASPD. None of the specific types of maltreatment increased risk for MDD in males. While these results for MDD and ASPD were expected, the strong link between abused/neglected males and BPD was surprising. BPD has generally been considered predominately a female diagnosis, with over 80% of BPD diagnoses being given to females (Paris, 2005). Furthermore, it has been suggested that sex differences in rates of BPD may reflect sex differences in rates of child sexual abuse (Douglas & Finkelhor, 2005; Widom et al., 2009). It is possible that BPD is representing both an internalizing and externalizing path for males, due to the roles of both hopelessness and impulsivity in creating the emotional lability of the borderline personality (Paris, 2005). Perhaps abused/neglected males are more likely to exhibit the emotional lability consistent with the BPD diagnosis than the more traditional internalizing depressive symptoms of the MDD diagnosis. It is also possible that this sex-anomalous result is representing what Widom, Ireland, and Glynn (1995) and Horowitz, Widom, McLaughlin, and White (2001) have called a “saturation effect.” In other words, females from the disadvantaged circumstances represented in this sample may already have such high rates of BPD that childhood victimization does not have an additional effect for them, whereas childhood victimization elevates the risk of experiencing BPD symptoms that might not otherwise occur for men. It is also possible that females presenting with BPD symptoms were more likely to have received treatment services than males prior to assessment. While these possible explanations require further testing, these results highlight the need to further examine the role of the Cluster B personality diagnoses in the relationship between child maltreatment and adult suicidality for both males and females. It is particularly important that future research attempt to replicate and

extend these results, considering that the assessment of the relationship of BPD and suicidality in the present study was only suggestive, limiting the ability to draw conclusions about the mediating role of BPD between child abuse/neglect and suicidality.

While the findings of this study are consistent with suicide research suggesting that males and females reach suicidality by different means, with males presenting as more impulsive and females as more internalizing and ruminative (Beautrais, 2006; Canetto, 1997; Hawton, 2000; Hunt et al., 2006), they are only partially consistent with research suggesting that maltreated males and females are at elevated risk for both internalizing and externalizing symptoms. Based on previous research indicating an increase in both internalizing and externalizing symptoms in male and female abuse/neglect victims, it was expected that both males and females with histories of maltreatment would exhibit internalizing and externalizing pathways to suicidality. While these results at least partially explain the relationship between females with histories of physical abuse, neglect, and multiple forms of maltreatment and adult suicidality through major depression and ASPD partially explains the relationship between sexual abuse and suicidality in females, ASPD mediated, and there was a suggestion that BPD mediated, the relationship between child abuse and neglect and adult suicidality in males. Therefore, it appears necessary to consider that all forms of maltreatment are not necessarily associated with both internalizing and externalizing pathways to suicidality for males and females. Rather, these findings suggest a starting point from which we should now expand our focus to consider other possible internalizing and externalizing pathways between child maltreatment and adult suicidality. It is also possible that an examination of symptoms rather than diagnoses would be more beneficial. For the purposes of the present study, diagnoses were chosen based on their utility in the assessment framework, but future research may wish to consider whether meeting specific

symptoms or number of symptoms within diagnoses would have better utility in the context of suicide risk assessment for this population. For example, some researchers have suggested that examining personality disorder symptoms rather than categorical personality disorders among individuals with histories of child maltreatment is more meaningful (Grover et al., 2007; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Johnson, Smailes, Cohen, Brown, & Bernstein, 2000; Miller & Lisak, 1999).

The results of this study also highlighted racial differences in suicidality that have emerged repeatedly over years of suicidality research. Consistent with the hypotheses, controlling for race in the analyses did not result in any significant differences in results. However, when the analyses were run separately for Blacks and Whites, race differences quickly became apparent. Despite the expectation that utilizing a large sample of Black and White participants would allow similarities among the races on the suicidality outcome to emerge, only abused/neglected Whites were at increased risk for suicidality in middle adulthood. While Joe (2006) has suggested that suicidality among Blacks has increased among cohorts born after 1958, it appears more likely that the present sample continues to exhibit a difference in suicidality historically found more often between Blacks and Whites. Whether such a difference is emerging due to differential protective factors (Garlow et al., 2005), underreporting of suicidality among Blacks (Watt & Sharp, 2002), or some other yet identified explanation, it is clear that it is important to consider the role of racial differences in the relationship between child maltreatment and adult suicidality.

This study had several unique strengths in its prospective longitudinal design, the use of court-documented cases of abuse and neglect, the large sample of men and women and Blacks and Whites, and follow-up into middle adulthood. Unlike prior studies utilizing cross-sectional

designs, small samples of primarily young women and girls, and retrospective reports of abuse, the nature of this study permits a strong demonstration of the long-term impact of child abuse and neglect on later suicidality. To our knowledge, this is the first prospective study using documented cases of child abuse and neglect followed up into adulthood to show an increase in risk of suicidality, rather than simply a correlation. Furthermore, it emphasizes the need for further examination of the differing impacts of type of child maltreatment and sex on suicidality. Not only does it appear that children may be at differential risk for suicidality based on the type of abuse they experienced, but these results also suggest that children may be at differential risk based on the interaction between sex and type of maltreatment.

Several limitations should be noted as well. First, because of its reliance on court-documented cases, these findings may not be generalizable to cases that are not reported to the authorities. Second, these cases are skewed toward the lower end of the socio-economic spectrum, so that it is difficult to generalize to cases of abuse or neglect that might have occurred in middle or upper class families. Third, the extent of unreported abuse or neglect in the comparison group is not known. Fourth, the number of documented cases of sexual abuse ($N = 11$) and multiple forms of maltreatment for males ($N = 18$) was relatively small and power was limited for these subsamples. Fifth, the diagnosis of lifetime BPD was assessed during a later interview (2000-2002) than the diagnoses of MDD, DA, and ASPD (1989-1995) and at the same interview as suicidality (2000-2002). Therefore, true mediation analysis was not possible using BPD due to the cross-sectional data collection of the BPD diagnosis and suicidality. The results of the analyses using BPD as a 'mediator' should only be considered suggestive of possible mediating relationships, not conclusive. Future research will need to attempt to replicate these results using longitudinal data, in which BPD is assessed at an earlier time than suicidality, in

order to conclude that BPD does in fact play a mediating role in the relationship between child abuse/neglect and adult suicidality. Sixth, the extent to which perpetrator identity impacted the results is unknown. Finally, this study did not take into account the possibility that some children may have been suicidal prior to experiencing maltreatment. Considering that incidences of maltreatment had to have occurred before 11 years of age, it is unlikely, but possible, that some children in the sample may have been predisposed to suicidality.

Despite these limitations, the findings of this study represent an important extension of previous knowledge regarding the long-term risk of suicidality associated with child abuse and neglect. This research reinforces the need for future research examining sex differences in suicidality and long-term adjustment from childhood victimization. Furthermore, it reinforces the need for interventions designed to minimize the consequences of childhood maltreatment on future development. Identifying the causes and developmental paths to suicidality is essential to creating effective suicide assessments and treatment interventions. The findings of this research indicate that assessment and treatment for suicidality are imperative for successful treatment of child abuse and neglect victims. We also now know that child abuse/neglect victims who meet diagnoses for MDD, ASPD, and/or BPD at some point in their lives are at increased risk for suicidality in adulthood. While we do not yet know if there are other specific pathways that may lead from child victimization to adult suicidality, we now know that the risk for suicidality affects both men and women victims of various types of child maltreatment well into adulthood.

Table 1

Rates of Attrition and Demographic Characteristics of Sample at Both Stages of Data Collection

	1989-1995 N = 1, 196	2000-2002 N = 892
Base used for attrition	1,575 ^a	1,196
<i>Reason for attrition</i>		
Unable to locate	268	79
Deceased	43	37
Incapable of being interviewed	8	4
Refused to participate	60	180
<i>Demographic Composition</i>		
Age, Mean (years)	29.2	39.5
Female (%)	48.7	51.0
Male (%)	51.3	49.0
White, Non-Hispanic (%)	61.5	60.8
Black, Non-Hispanic (%)	32.5	32.6

^a Original Sample.

Table 2

Factor Loadings for Four Suicidality Questions in Factor Analysis

	Suicidality	Communality	Eigenvalue	% Total Variance
4 Variables Included:			2.24	55.19
Thoughts of Death	.54	.29		
Wish For Death	.83	.69		
Thoughts of Suicide	.83	.69		
Suicide Attempts	.75	.56		
3 Variables Included:			2.05	68.32
Wish For Death	.83	.70		
Thoughts of Suicide	.85	.73		
Suicide Attempts	.79	.63		

Note. Sample size is 892.

Table 3

Prevalence of Suicidality in Abused and Neglected Children Grown Up and Matched Controls

Group ^a	N	Suicidality			<i>p</i>
		%	OR	95% CI	
Control	395	30.9			
Abuse/Neglect	496	42.7	1.67	[1.26, 2.21]	.00
Sexual Abuse	67	46.3	1.93	[1.14, 3.26]	.01
Physical Abuse	77	48.1	2.07	[1.26, 3.40]	.00
Neglect	403	41.7	1.60	[1.20, 2.14]	.00
Multiple Forms	50	48.0	2.60	[1.14, 3.74]	.02
Female					
Control	193	31.6			
Abuse/Neglect	263	45.6	1.82	[1.23, 2.68]	.00
Sexual Abuse	56	48.2	2.02	[1.10, 3.69]	.02
Physical Abuse	38	52.6	2.40	[1.19, 4.87]	.01
Neglect	202	45.5	1.81	[1.20, 2.73]	.00
Multiple Forms	32	59.4	3.16	[1.47, 6.82]	.00
Male					
Control	202	30.2			
Abuse/Neglect	233	39.5	1.51	[1.01, 2.25]	.04
Sexual Abuse	11	36.4	1.32	[0.37, 4.68]	.66
Physical Abuse	39	43.6	1.79	[0.89, 3.60]	.10
Neglect	201	37.8	1.41	[0.93, 2.13]	.11
Multiple Forms	18	27.8	.89	[0.30, 2.60]	.83
White					
Control	241	33.6			
Abuse/Neglect	301	47.5	1.79	[1.26, 2.54]	.00
Sexual Abuse	38	52.6	2.20	[1.10, 4.38]	.03
Physical Abuse	57	47.4	1.78	[0.99, 3.19]	.05
Neglect	241	33.6	1.73	[1.20, 2.50]	.00
Multiple Forms	38	47.4	1.78	[0.89, 3.55]	.10
Black					
Control	135	26.7			
Abuse/Neglect	155	33.5	1.39	[0.84, 2.30]	.20
Sexual Abuse	21	33.3	1.38	[0.51, 3.68]	.53
Physical Abuse	13	46.2	2.36	[0.74, 7.48]	.15
Neglect	131	32.8	1.34	[0.79, 2.28]	.27
Multiple Forms	9	44.4	2.20	[0.56, 8.65]	.26

Notes. Results are unadjusted for demographics of race and age; % = percent of group endorsing suicidality; OR = odds ratio; CI = confidence interval. Results for adjusted scores are presented in Appendix A. Bold ORs are significant.

^a The numbers of cases of specific types of abuse and neglect do not add up to the total in the abuse/neglect group because some individuals experienced more than one type of abuse or neglect.

Table 4

Prevalence of Psychiatric Disorders in Abused and Neglected Children Grown Up and Matched Controls

Group	MDD			ASPD			BPD		
	%	OR	95% CI	%	OR	95% CI	%	OR	95% CI
Control	19.5			10.4			9.1		
Abuse/Neglect	28.7	1.66**	[1.21, 2.28]	18.0	1.89**	[1.27, 2.81]	13.7	1.59*	[1.04, 2.44]
Sexual Abuse	26.9	1.52	[0.84, 2.75]	13.4	1.34	[0.62, 2.90]	13.4	1.55	[0.71, 3.38]
Physical Abuse	35.5	2.28**	[1.34, 3.87]	15.8	1.62	[0.81, 3.25]	18.2	2.22*	[1.13, 4.34]
Neglect	28.8	1.67**	[1.20, 2.32]	19.1	2.04**	[1.36, 3.07]	13.7	1.58*	[1.01, 2.47]
Multiple Forms	38.0	2.53**	[1.36, 4.72]	18.0	1.90	[0.86, 4.18]	20.0	2.49*	[1.15, 5.40]
Female									
Control	23.8			5.7			11.4		
Abuse/Neglect	35.0	1.72**	[1.13, 2.61]	10.6	1.97	[0.96, 4.07]	12.9	1.15	[0.65, 2.04]
Sexual Abuse	30.4	1.39	[0.72, 2.69]	14.3	2.76**	[1.05, 7.24]	14.3	1.30	[0.54, 3.09]
Physical Abuse	50.0	3.20**	[1.56, 6.55]	10.5	1.95	[0.59, 6.47]	10.5	0.91	[0.39, 2.82]
Neglect	35.1	1.73**	[1.12, 2.69]	9.9	1.82	[0.85, 3.90]	13.9	1.25	[0.69, 2.27]
Multiple Forms	46.9	2.82**	[1.31, 6.09]	12.5	2.36	[0.70, 7.94]	18.8	1.79	[0.67, 4.84]
Male									
Control	21.6			14.9			6.9		
Abuse/Neglect	23.8	1.52	[0.92, 2.48]	26.3	2.05**	[1.26, 3.32]	14.7	2.31*	[1.20, 4.43]
Sexual Abuse	9.1	0.55	[0.07, 4.46]	9.1	0.57	[0.07, 4.64]	19.1	1.34	[0.16, 11.26]
Physical Abuse	21.1	1.47	[0.62, 3.51]	21.1	1.52	[0.64, 3.65]	25.6	4.63*	[1.88, 11.40]
Neglect	22.4	1.59	[0.96, 2.64]	28.4	2.27**	[1.38, 3.72]	13.5	2.10*	[1.06, 4.13]
Multiple Forms	22.2	1.58	[0.49, 5.11]	27.8	2.21	[0.73, 6.64]	22.2	3.84*	[1.11, 13.22]

(continued)

	MDD			ASPD			BPD		
	%	OR	95% CI	%	OR	95% CI	%	OR	95% CI
White									
Control	18.3			7.5			9.1		
Abuse/Neglect	31.3	2.04**	[1.36, 3.07]	18.0	2.72**	[1.55, 4.78]	13.3	2.25	[0.89, 5.70]
Sexual Abuse	26.3	1.60	[0.72, 3.53]	10.5	1.46	[0.47, 4.57]	15.8	3.73	[0.92, 15.10]
Physical Abuse	32.1	2.12*	[1.11, 4.06]	12.5	1.77	[0.70, 4.47]	14.0	1.99	[0.69, 5.72]
Neglect	32.4	2.14**	[1.41, 3.27]	20.5	3.19**	[1.80, 5.66]	13.5	2.06	[0.77, 5.50]
Multiple Forms	34.2	2.32*	[1.11, 4.91]	18.4	2.80*	[1.08, 7.24]	18.4	2.24	[0.89, 5.70]
Black									
Control	22.2			12.6			8.9		
Abuse/Neglect	22.6	1.02	[0.59, 1.78]	16.8	1.40	[0.72, 2.71]	14.9	2.91	[0.55, 15.71]
Sexual Abuse	19.0	.82	[0.26, 2.63]	19.0	1.63	[0.49, 5.43]	9.5	0	[0,0]
Physical Abuse	38.5	2.19	[0.67, 7.18]	30.8	3.09	[0.86, 11.13]	38.5	4.10	[0.72, 23.45]
Neglect	22.9	1.04	[0.59, 1.85]	15.3	1.25	[0.62, 2.51]	13.8	5.13	[0.85, 30.94]
Multiple Forms	44.4	2.80	[0.71, 11.09]	22.2	1.98	[0.38, 10.34]	22.2	2.93	[0.55, 15.71]

Note. Results are unadjusted for demographics of race and age. % = percent of group meeting lifetime diagnoses of MDD, DA, ASPD, and BPD; OR = odds ratio; CI = confidence interval. Results for adjusted scores are presented in Appendix A. Bold ORs are significant.

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

Table 5

Relationship Between Psychiatric Disorder and Suicidality Controlling for Child Abuse and Neglect

Diagnosis	Suicidality									
	Abuse/Neglect		Sexual Abuse		Physical Abuse		Neglect		Multiple Forms	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
MDD										
Group	4.01***	[2.90, 5.53]	4.41***	[2.74, 7.12]	3.54***	[2.49, 6.88]	3.60***	[2.56, 5.05]	3.42***	[2.13, 5.49]
Female	3.89***	[2.54, 5.95]	5.47***	[2.94, 10.18]	3.68***	[1.99, 6.80]	3.33***	[2.12, 5.25]	3.56***	[1.90, 6.67]
Male	4.14***	[2.49, 6.88]	3.17**	[1.47, 6.86]	3.38**	[1.66, 6.85]	3.88***	[2.30, 6.54]	3.05**	[1.45, 6.40]
White	3.43***	[2.27, 5.17]	4.83***	[2.55, 9.16]	4.00***	[2.21, 7.23]	3.25***	[2.11, 5.00]	4.17***	[2.25, 7.72]
Black	4.98***	[2.76, 8.96]	3.75**	[1.68, 8.36]	3.19**	[1.43, 7.14]	4.71***	[1.36, 6.96]	3.07**	[1.36, 6.96]
ASPD										
Group	2.08***	[1.42, 3.04]	2.40**	[1.32, 4.36]	2.40**	[1.34, 4.29]	2.15***	[1.44, 3.20]	2.38**	[1.31, 4.34]
Female	3.61***	[1.77, 7.37]	3.12*	[1.16, 8.34]	3.87*	[1.26, 11.92]	4.11**	[1.83, 9.26]	3.67*	[1.18, 11.41]
Male	1.82*	[1.13, 2.93]	2.13*	[1.00, 4.65]	2.13*	[1.05, 4.33]	1.95**	[1.19, 3.18]	2.32*	[1.10, 4.88]
White	1.64*	[1.00, 2.73]	<u>2.21</u>	[0.91, 5.37]	2.35*	[1.02, 5.42]	3.87*	[1.26, 11.92]	2.36*	[1.02, 5.47]
Black	2.52**	[1.30, 4.88]	3.49*	[1.36, 9.00]	3.18*	[1.23, 8.30]	2.13*	[1.05, 4.33]	3.43*	[1.27, 9.28]
BPD										
Group	9.46***	[5.61, 15.94]	14.15***	[6.12, 32.68]	9.71***	[4.68, 20.11]	9.69***	[5.58, 16.84]	10.47***	[4.88, 22.47]
Female	34.98***	[7.96, 153.79]	<u>0</u>	[0,0]	34.18***	[7.75, 150.72]	26.28***	[9.17, 75.33]	34.98***	[7.96, 152.79]
Male	4.49**	[1.62, 12.46]	2.82*	[1.00, 8.14]	4.61**	[1.84, 11.55]	4.87**	[2.24, 9.79]	4.49**	[1.62, 12.46]
White	10.80***	[3.96, 29.47]	16.71***	[4.81, 58.08]	10.32***	[3.76, 28.36]	10.81***	[3.95, 29.59]	10.80***	[3.96, 29.47]
Black	8.02**	[2.33, 27.58]	10.67**	[2.70, 42.17]	8.27**	[2.39, 28.56]	9.19**	[2.60, 32.51]	8.02**	[2.33, 27.58]

Note. All relationships are significant with the exception of two, which are identified by underlining. Results are unadjusted for demographics of race and age. OR = odds ratio; CI = confidence interval. Results for adjusted scores are presented in Appendix A.

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

Table 6

Comparison of Relationship Between Child Abuse/Neglect and Suicidality With and Without Adjustment for Psychiatric Diagnoses

		Suicidality							
		<u>Abuse/Neglect</u>		<u>Physical Abuse</u>		<u>Neglect</u>		<u>Multiple Forms</u>	
	Group	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<u>Unadjusted</u>	Overall	1.67***	[1.26, 2.21]	2.07*	[1.26, 3.40]	1.60**	[1.20, 2.14]	2.06*	[1.14, 3.74]
<u>Adjusted For:</u>									
MDD	Overall	1.51**	[1.13, 2.02]	1.71*	[1.01, 2.88]	1.45*	[1.07, 1.97]	1.71	[0.92, 3.18]
ASPD	Overall	1.58	[1.19, 2.09]			1.50*	[1.12, 2.02]		
BPD	Overall	1.58	[1.18, 2.12]	1.84*	[1.08, 3.13]	1.51**	[1.11, 2.05]	1.76	[0.93, 3.35]
<u>Unadjusted</u>	Female	1.82**	[1.23, 2.68]	2.40*	[1.19, 4.87]	1.81**	[1.20, 2.73]	3.16**	[1.47, 6.82]
	Male	1.51*	[1.01, 2.25]						
<u>Adjusted For:</u>									
MDD	Female	1.63*	[1.08, 2.45]	1.81	[0.85, 3.83]	1.63*	[1.07, 2.50]		
	Male								
ASPD	Female ^a								
	Male	1.40	[0.93, 2.09]						
BPD	Female								
	Male	1.51	[0.89, 2.02]						
<u>Unadjusted</u>	White	1.79**	[1.26, 2.54]			1.73**	[1.20, 2.50]		
<u>Adjusted For:</u>									
MDD	White	1.56*	[1.08, 2.24]			1.50*	[1.03, 2.20]		
ASPD	White	1.67*	[1.11, 2.35]						

Note. Step 4 of the mediation analysis was not completed if any of the preceding steps were not met. OR = odds ratio, CI = confidence interval.

^a ASPD partially mediated the relationship between sexual abuse and suicidality for females (unadjusted OR = 2.02, 95% CI [1.10, 3.69], $p = .023$; adjusted OR = 1.86, 95% CI [1.00, 3.44], $p = .05$).

APPENDIX A

Table A1

Prevalence of Suicidality in Abused and Neglected Children Grown Up and Matched Controls Adjusted for Race and Age

Group ^a	N	Suicidality			
		%	OR	95% CI	<i>p</i>
Control	395	30.9			
Abuse/Neglect	496	42.7	1.65	[1.24, 2.20]	.00
Sexual Abuse	67	46.3	1.88	[1.07, 3.28]	.03
Physical Abuse	77	48.1	1.88	[1.12, 3.17]	.02
Neglect	403	41.7	1.60	[1.18, 2.16]	.00
Multiple Forms	50	48.0	1.86	[1.00, 3.44]	.05
Female					
Control	193	31.6			
Abuse/Neglect	263	45.6	1.80	[1.20, 2.69]	.00
Sexual Abuse	56	48.2	1.94	[1.02, 3.70]	.05
Physical Abuse	38	52.6	2.13	[1.00, 4.56]	.05
Neglect	202	45.5	1.83	[1.20, 2.80]	.00
Multiple Forms	32	59.4	2.79	[1.27, 6.13]	.01
Male					
Control	202	30.2			
Abuse/Neglect	233	39.5	1.48	[.98, 2.24]	.06
Sexual Abuse	11	36.4	1.42	[.38, 5.27]	.60
Physical Abuse	39	43.6	1.68	[.82, 3.47]	.16
Neglect	201	37.8	1.37	[.89, 2.11]	.15
Multiple Forms	18	27.8	.73	[.22, 2.37]	.60

Notes. % = percent of group endorsing suicidality; OR = odds ratio; CI = confidence interval. Bold ORs are significant.

^a The numbers of cases of specific types of abuse and neglect do not add up to the total in the abuse/neglect group because some individuals experienced more than one type of abuse or neglect.

Table A2

Prevalence of Psychiatric Disorders in Abused and Neglected Children Grown Up and Matched Controls Adjusted for Race and Age

Group	MDD			ASPD			BPD		
	%	OR	95% CI	%	OR	95% CI	%	OR	95% CI
Control	19.5			10.4			9.1		
Abuse/Neglect	28.7	1.67**	[1.19, 2.34]	18.0	2.09**	[1.37, 3.19]	13.7	1.62*	[1.04, 2.52]
Sexual Abuse	26.9	1.27	[0.66, 2.43]	13.4	1.54	[0.67, 3.51]	13.4	1.13	[0.58, 2.22]
Physical Abuse	35.5	2.14**	[1.21, 3.78]	15.8	2.12	[0.99, 4.49]	18.2	2.41*	[1.19, 4.90]
Neglect	28.8	1.67**	[1.20, 2.34]	19.1	2.24***	[1.45, 3.45]	13.7	1.59*	[1.00, 2.52]
Multiple Forms	38.0	2.43**	[1.26, 4.67]	18.0	2.56*	[1.13, 5.81]	20.0	2.39*	[1.05, 5.39]
Female									
Control	23.8			5.7			11.4		
Abuse/Neglect	35.0	1.64*	[1.08, 2.49]	10.6	1.92	[0.90, 4.13]	12.9	1.24	[0.68, 2.25]
Sexual Abuse	30.4	1.14	[0.56, 2.34]	14.3	2.89*	[1.03, 8.12]	14.3	1.37	[0.59, 3.19]
Physical Abuse	50.0	3.10**	[1.43, 6.75]	10.5	2.16	[0.54, 8.73]	10.5	1.14	[0.46, 2.82]
Neglect	35.1	1.74**	[1.11, 2.73]	9.9	1.80	[0.81, 4.00]	13.9	1.51	[0.78, 2.93]
Multiple Forms	46.9	2.68*	[1.21, 5.92]	12.5	3.52*	[1.10, 11.29]	18.8	3.17	[0.79, 12.77]
Male									
Control	21.6			14.9			6.9		
Abuse/Neglect	23.8	1.37	[0.89, 2.12]	26.3	2.39**	[1.42, 4.03]	14.7	2.20*	[1.13, 4.28]
Sexual Abuse	9.1	.61	[0.07, 5.00]	9.1	.85	[0.10, 7.14]	19.1	1.46	[0.17, 12.56]
Physical Abuse	21.1	1.36	[0.54, 3.42]	21.1	2.15	[0.86, 5.33]	25.6	4.61**	[1.77, 11.97]
Neglect	22.4	1.56	[0.93, 2.63]	28.4	2.65***	[1.56, 4.49]	13.5	1.93	[0.97, 3.87]
Multiple Forms	22.2	1.34	[0.36, 5.05]	27.8	2.95	[0.84, 10.41]	22.2	1.88	[0.68, 5.19]

Notes. % = percent of group meeting lifetime diagnoses of MDD, DA, ASPD, and BPD; OR = odds ratio; CI = confidence interval. Bold ORs are significant.

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

Table A3

Relationship Between Psychiatric Disorder and Suicidality Controlling for Child Abuse and Neglect Adjusted for Race and Age

Diagnosis	Suicidality									
	Abuse/Neglect		Sexual Abuse		Physical Abuse		Neglect		Multiple Forms	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<u>MDD</u>										
Group	3.89***	[2.78, 5.45]	4.41***	[2.68, 7.25]	3.70***	[2.30, 5.95]	3.69***	[2.60, 5.25]	3.39***	[2.11, 5.48]
Female	3.44***	[2.21, 5.35]	5.32***	[2.76, 10.27]	3.50***	[1.85, 6.64]	3.22***	[2.02, 5.14]	3.63***	[1.98, 7.40]
Male	4.57***	[2.68, 7.79]	3.40**	[1.54, 7.47]	4.01**	[1.92, 8.36]	4.28***	[2.48, 7.39]	3.73**	[1.86, 6.48]
<u>ASPD</u>										
Group	1.93**	[1.29, 2.90]	2.73**	[1.42, 5.23]	2.69**	[1.43, 5.06]	2.01**	[1.32, 3.08]	2.36**	[1.31, 4.31]
Female	3.47**	[1.62, 7.43]	4.02*	[1.37, 11.77]	5.11*	[1.47, 17.80]	4.21**	[1.77, 10.01]	3.67*	[1.18, 11.41]
Male	1.69*	[1.02, 2.82]	2.24	[0.96, 2.80]	2.27*	[1.06, 4.86]	1.80*	[1.06, 3.04]	2.32*	[1.10, 4.88]
<u>BPD</u>										
Group	8.97***	[5.26, 15.27]	13.07***	[5.60, 30.51]	9.24***	[4.41, 19.37]	9.03***	[5.14, 15.85]	9.96***	[4.62, 23.82]
Female	25.77***	[9.00, 73.77]	<u>0</u>	[0,0]	30.67***	[6.89, 136.46]	23.49***	[8.14, 67.82]	34.74***	[6.99, 143.96]
Male	4.73***	[2.40, 9.32]	2.78	[0.96, 8.09]	4.50**	[1.76, 11.47]	4.72***	[2.28, 9.75]	4.62**	[1.22, 12.14]

Note. All relationships are significant with the exception of two, which are identified by underlining.

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

Table A4

Comparison of Relationship Between Child Abuse/Neglect and Suicidality With and Without Adjustment for Psychiatric Diagnoses Adjusted for Race and Age

		Suicidality							
		<u>Abuse/Neglect</u>		<u>Physical Abuse</u>		<u>Neglect</u>		<u>Multiple Forms</u>	
	Group	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<u>Unadjusted</u>	Overall	1.65**	[1.24, 2.20]	1.88*	[1.12, 3.17]	1.60**	[1.18, 2.16]	1.86*	[1.00, 3.44]
<u>Adjusted For:</u>									
MDD	Overall	1.50**	[1.11, 2.03]	1.57	[0.90, 2.72]	1.44*	[1.05, 1.97]	1.53	[0.80, 2.93]
ASPD	Overall	1.56	[1.16, 2.08]			1.50*	[1.10, 2.03]	1.69	[0.90, 3.17]
BPD	Overall	1.54	[1.14, 2.10]	1.84*	[1.08, 3.13]	1.50**	[1.09, 2.06]	1.59	[0.82, 3.09]
<u>Unadjusted</u>	Female	1.80**	[1.20, 2.69]	2.13*	[1.00, 4.56]	1.83**	[1.20, 2.80]	2.79**	[1.27, 6.13]
	Male	1.48	[0.98, 2.24]						
<u>Adjusted For:</u>									
MDD	Female	1.64*	[1.08, 2.49]	1.62	[0.72, 3.63]	1.80**	[1.20, 2.87]	2.28*	[1.00, 5.24]
	Male								
ASPD	Female ^a							2.58*	[1.15, 5.76]
	Male								
BPD	Female								
	Male								

Notes. Step 4 of the mediation analysis was not completed if any of the preceding steps were not met. OR = odds ratio, CI = confidence interval.

^a ASPD fully mediated the relationship between sexual abuse and suicidality for females (unadjusted OR = 1.94, 95% CI [[1.02, 3.70], p = .045; adjusted OR = 1.75, 95% CI [.90, 3.41], p = .10).

APPENDIX B

Path analysis using Mplus 5.21 (Muthén & Muthén, 1998-2007) was conducted to assess the fit of the structural models describing relationships between child abuse/neglect, MDD, ASPD,² and suicidality. Mplus 5.21 utilizes Weighted Least Square Mean and Variance Adjusted (WLSMV) was used to handle dichotomous variables and missing data. The full model included paths from child abuse/neglect to both MDD and ASPD and from both MDD and ASPD to suicidality (see Figure B1). MDD and ASPD were allowed to correlate with each other. In order to determine whether the model was also a good fit for males and females, it was run again separately for both groups. Based on non-significant findings for Blacks in univariate analyses, a separate model was run for Whites. Due to the smaller sample sizes for the specific types of child maltreatment, the path models were only tested for overall child abuse/neglect.

A sample size of at least 100 and 10 to 20 subjects per estimated parameter is recommended for SEM, and five subjects per estimated parameter is considered adequate (Kline, 2005). The full model tested included five observed variables and 10 parameter estimates (including error terms, variable and residual variances, residual correlations, and path estimates). Therefore, at least 100 participants are required and 200 would meet the most conservative recommendation. The sample size of this study is more than adequate to meet this recommendation.

Several indices of overall model fit are reported. A chi-square (χ^2) statistic reflects the difference between the observed model relationships and estimated relationships based on the specified model. A non-significant χ^2 ($p \geq .05$) indicates a good fit. The Comparative Fit Index

² DA and BPD were excluded from path analyses due to the fact that, a) child abuse/neglect and matched control participants did not differ significantly on lifetime diagnosis of DA, and b) as previously noted, BPD diagnoses were assessed during a later interview (2000-2002) than MDD and ASPD (1989-1995).

(CFI) and Tucker-Lewis Index (TLI) indicate how well the model explains the data relative to a model stipulating no common variance in the data. Indices of .90 or higher indicate a good fit. The Root Mean Square Error of Approximation (RMSEA) reflects the average size of the model misfit. RMSEA of .05 or lower is considered a close fit. Individual path estimates are reported as regression coefficients (*b*). Current recommendations support consideration of both the χ^2 test and the other fit indices because the χ^2 test can be overly sensitive to discrepancies between observed and expected relationships with a large sample, but fit indices do not provide tests of significance (Barrett, 2007).

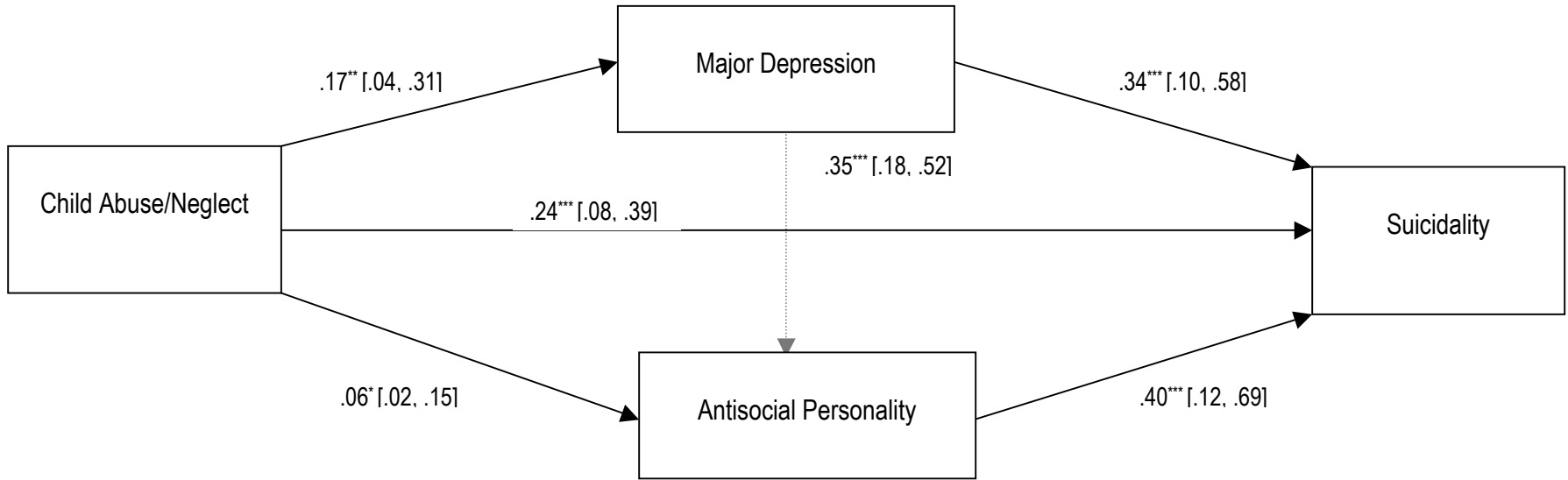


Figure B1. Path Model with MDD and ASPD as mediators between child abuse/neglect and suicidality. Rectangles represent predictor, outcome, and mediator variables; solid lines represent estimated paths; perforated line represents covariance between mediators. Path estimates are standardized logistic regression coefficients. Results are unadjusted for race. The overall model provided a good fit ($\chi^2 = 2.72$, $df = 2$, $p = .26$; CFI = 1.00; TLI = .99; RMSEA = .02). * $p < .05$. ** $p < .01$. *** $p < .001$.

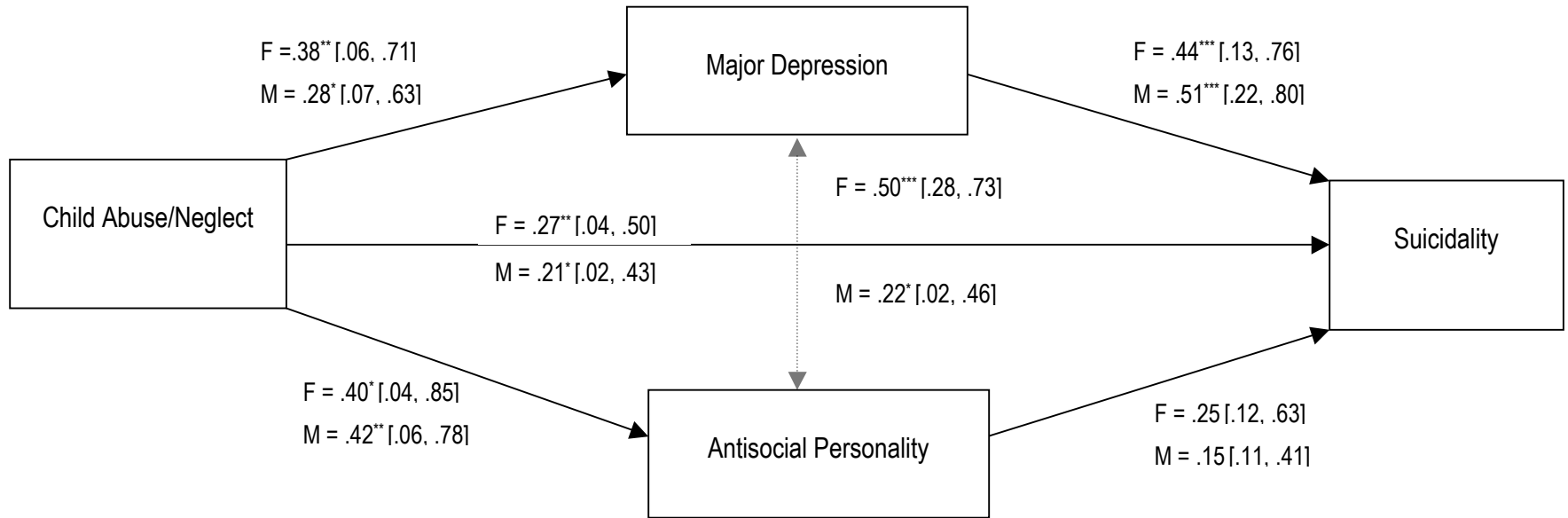


Figure B2. Path Model with MDD and ASPD as Mediators Between Child Abuse/Neglect and Suicidality for Females and Males. Rectangles represent predictor, outcome, and mediator variables; solid lines represent estimated paths; perforated line represents covariance between mediators. Path estimates are standardized logistic regression coefficients. F = female; M = male. Results are unadjusted for race. The model proved to be a good fit for both males ($\chi^2 = .61$, $df = 1$, $p = .43$; CFI = 1.00; TLI = 1.04; RMSEA = .00) and females ($\chi^2 = 2.17$, $df = 1$, $p = .14$; CFI = .99; TLI = .94; RMSEA = .05). * $p < .05$. ** $p < .01$. *** $p < .001$.

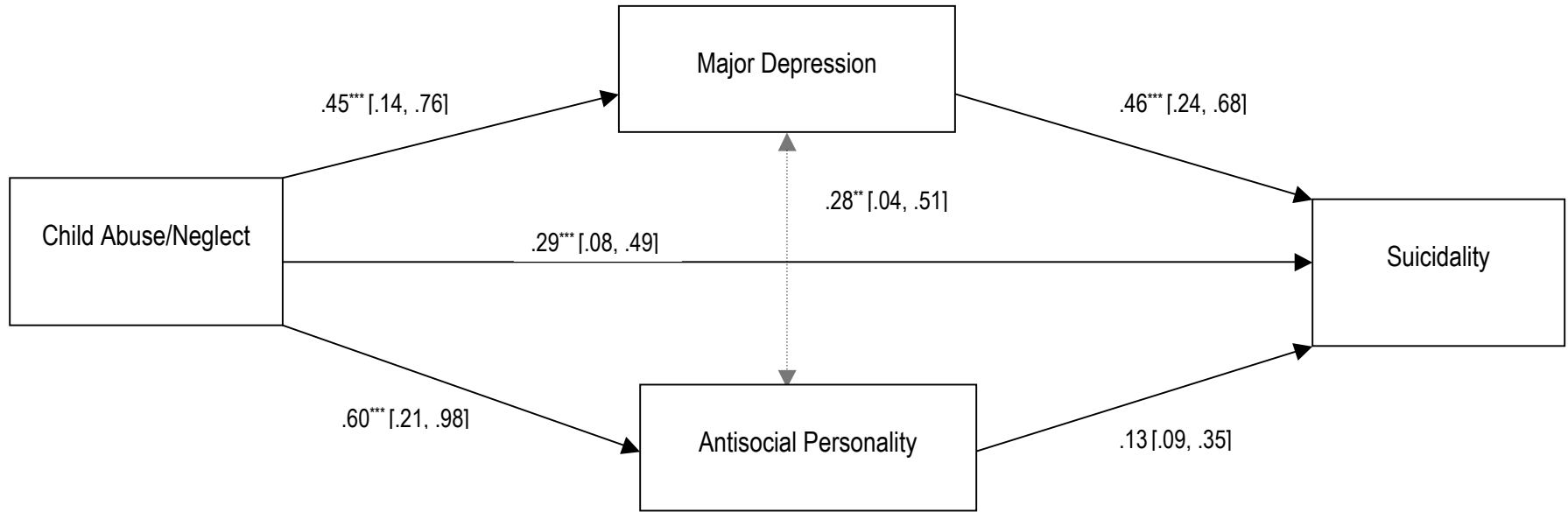


Figure B3. Path Model with MDD and ASPD as mediators between child abuse/neglect and suicidality for Whites. Rectangles represent predictor, outcome, and mediator variables; solid lines represent estimated paths; perforated line represents covariance between mediators. Path estimates are standardized logistic regression coefficients. Results are unadjusted for race. The model for Whites was a good fit ($\chi^2 = 1.50$, $df = 2$, $p = .47$; CFI = 1.00; TLI = 1.02; RMSEA = .00). * $p < .05$. ** $p < .01$. *** $p < .001$.

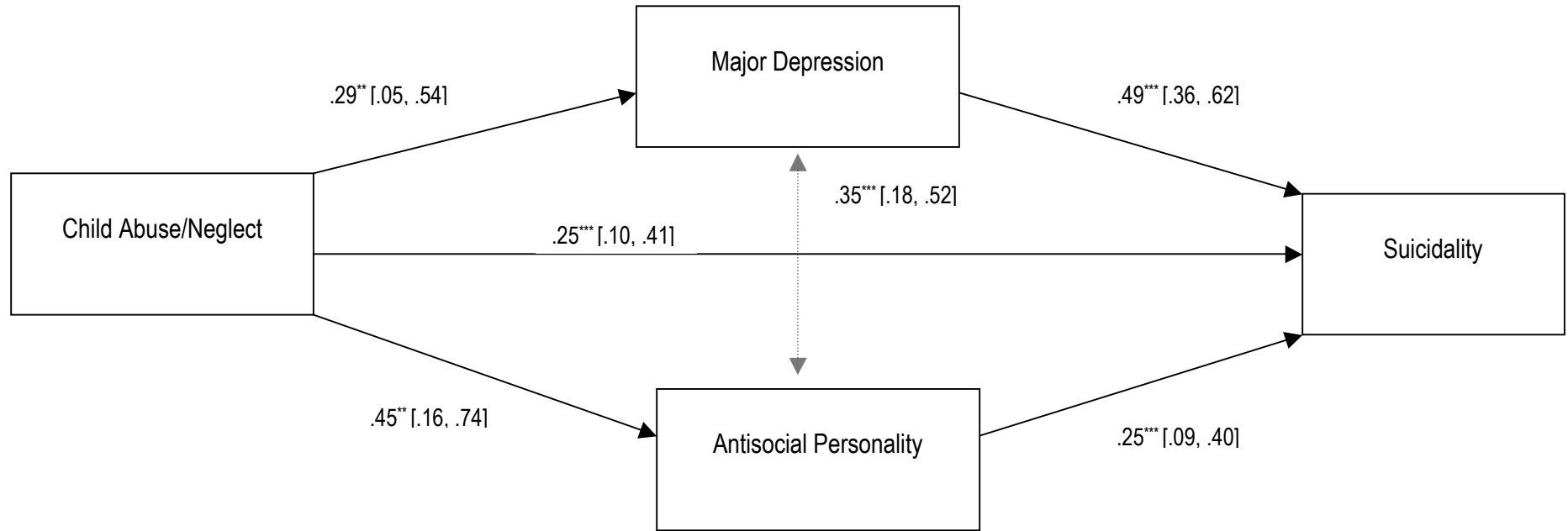
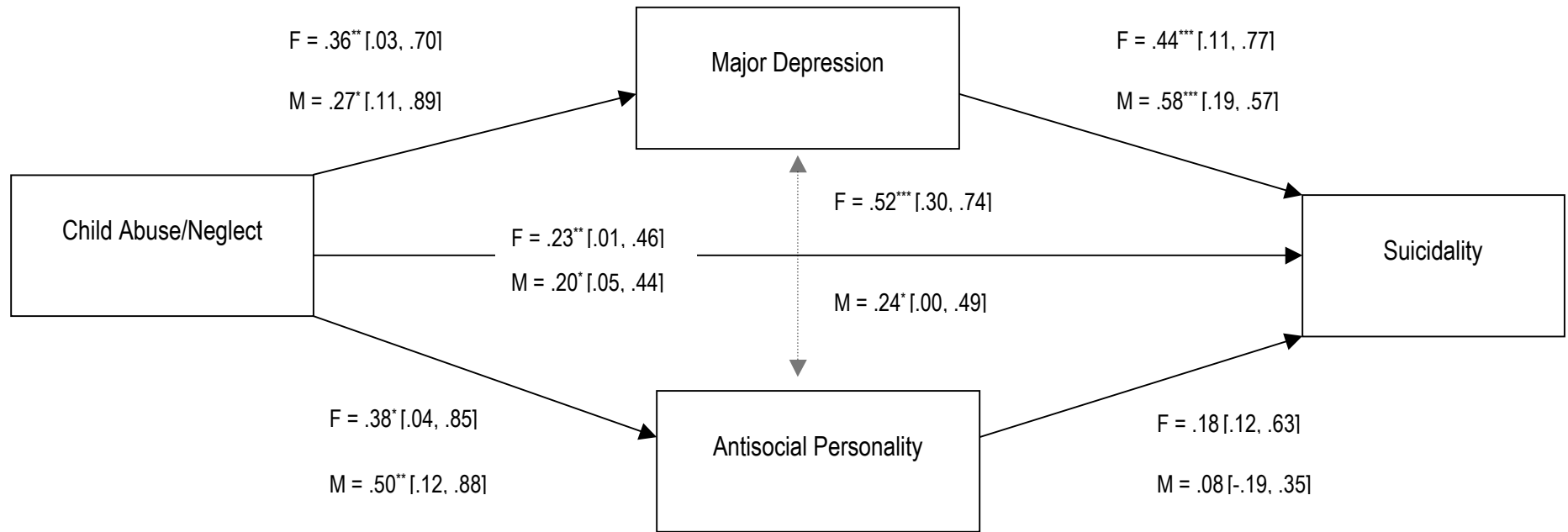


Figure B4. Path Model with MDD and ASPD as Mediators Between Child Abuse/Neglect and Suicidality Adjusted for Race and Age. Rectangles represent predictor, outcome, and mediator variables; solid lines represent estimated paths; perforated line represents covariance between mediators. Path estimates are standardized logistic regression coefficients. Overall fit for model was poor ($\chi^2 = 46.70$, $df = 4$, $p < .001$; CFI = .77; TLI = .37; RMSEA = .11; WRMR = 1.61). * $p < .05$. ** $p < .01$. *** $p < .001$.



FigureB5. Path Model with MDD and ASPD as Mediators Between Child Abuse/Neglect and Suicidality for Females and Males Adjusted for Race and Age. Rectangles represent predictor, outcome, and mediator variables; solid lines represent estimated paths; perforated line represents covariance between mediators. Path estimates are standardized logistic regression coefficients. F = female; M = male. Overall fit for female and male models was poor (Female $\chi^2 = 6.25$, $df = 2$, $p = .04$; CFI = .96; TLI = .82; RMSEA = .07; WRMR = .64; Male $\chi^2 = 5.55$, $df = 2$, $p = .06$; CFI = .94; TLI = .77; RMSEA = .07; WRMR = .59). * $p < .05$. ** $p < .01$. *** $p < .001$.

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