

**RACE AND SOCIOECONOMIC DIFFERENCES IN THE LONG-TERM OUTCOMES
OF CHILDHOOD MALTREATMENT**

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University of Pittsburgh, 2008

Childhood maltreatment (CM) is associated with negative physical, psychological, and social outcomes throughout life. Among the important psychosocial outcomes for female victims of CM is the risk for subsequent violent victimization during adulthood. Few studies have examined the risk and protective factors associated with revictimization and following CM. Additionally, although both CM and adult violent victimization (AVV) are associated with factors that impact women's socioeconomic status, there is a paucity of research explicitly examining socioeconomic outcomes, such as neighborhood characteristics, among victimized women.

Racial and socioeconomic differences exist in the prevalence of both CM and AVV, yet little data exists to show demonstrate, how those factors impact the CM-AVV relation. This study examined the role of race in the association between CM and AVV and related socioeconomic outcomes among adult women. The goals were to; 1) Characterize the association between CM and AVV; 2) Examine whether there are racial differences in the association between CM and AVV; and 3) Determine whether victimization history is associated with the characteristics of the neighborhood in which one resides.

Women (n=477) participating in a longitudinal study of the effects of prenatal exposure to alcohol and marijuana were interviewed about their history of exposure to CM and AVV. Other measures included demographic characteristics, social support, substance use, depression and anxiety, and household environment.

The results demonstrated an increased likelihood of experiencing AVV among women who reported a history of CM; regardless of the type of maltreatment experienced. Baseline illicit drug use partially mediated the CM-AVV relation. The risk of AVV associated with CM was not different by race; however, baseline marijuana use was found to mediate the CM-AVV relation for Caucasian women only. Victimization was not associated with neighborhood-level characteristics.

There are several important public health implications of this study. When all forms of CM exposure are considered there is a substantial increase in the odds of experiencing AVV, both intimate partner violence and non-intimate partner violence. This study also suggests that approaches to prevent revictimization should differ depending on race, and that drug interventions may be more relevant for Caucasian women.

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1.0 INTRODUCTION/OVERVIEW

Childhood maltreatment is associated with negative physical, psychological, and social outcomes throughout life. However, little is known about the risk and protective factors for these outcomes. A gap exists in the research literature on psychosocial factors that influence the relations between maltreatment in childhood and adverse psychosocial outcomes in adult life, particularly violent victimization of women. Of particular interest are whether race and psychological functioning affect the relations between childhood maltreatment, adult revictimization, and subsequent socioeconomic outcomes. The goal of the proposed research is to examine the role of race in the association between childhood maltreatment and adult violent victimization and related socioeconomic outcomes among adult women. The following research aims and hypotheses will be used to achieve this goal:

Aim 1: Characterize the association between childhood maltreatment (CM) and adult violent victimization (AVV). Women with a history of CM will be compared to those without such a history on AVV to determine how characteristics of the exposure (#forms of maltx) and risk/protective factors impact subsequent victimization.

H1: Women with a history of exposure to more forms of CM will report more AVV.

H2: The relation between CM and AVV will be mediated by demographic, environmental, social, and psychological factors as well as substance use/abuse.

H3: The association between CM and AVV will remain significant after controlling for significant mediators.

Aim 2: To examine whether there are racial differences in the association between CM and AVV.

H4: Caucasian women will report CM with greater frequency than African American women.

H5: African American women will report AVV with greater frequency than Caucasian women.

H6: Among those with a history of CM, rates of revictimization will be higher among African American women.

H7: The mediators in the CM-AVV relation will differ by race.

H8: Sociodemographic factors will moderate the CM-AVV relation.

Aim 3: Determine whether victimization history is associated with the characteristics of the neighborhood in which one resides. Three different levels of victimization, CM only, AVV only, or revictimization, will be examined as exposures and the participant's neighborhood at the time of the most recent data collection will be the outcome.

H9: Revictimization will be associated with living in areas of more social disorganization when compared to a history of CM only or AVV only.

H10: Revictimization will lead to a higher likelihood of living in an area of high social disorganization for Caucasian women compared to African American women.

H11: Victimization (CM, AVV, or both) will lead to higher likelihood for living in a race discordant neighborhood for Caucasian women compared to African American women.

1.1 CHILDHOOD MALTREATMENT

1.1.1 Definition

Childhood maltreatment (CM) is defined as behavior towards a child which is outside the norms of conduct and entails a substantial risk of causing physical or emotional harm (National Research Council, 1993). Such behaviors can be acts of commission or omission and can be either intentional or unintentional (Christoffel et al., 1992).

There are three categories of abuse: physical, emotional, and sexual. Physical abuse can include punching, beating, kicking, biting, burning, shaking, or otherwise harming a child. Sexual abuse includes fondling a child's genitals, incest, penetration, rape, sodomy, indecent exposure, and commercial exploitation through prostitution or the production of pornographic materials. Emotional abuse is defined as any pattern of behavior that harms a child's emotional development or sense of self-worth, including frequent belittling, rejection, threats, and withholding of love and support.

Neglect is defined as failure to provide for a child's basic needs and can be either physical or emotional. Physical neglect can include failure to ensure provision of adequate supervision, education, or medical care. Examples of emotional neglect include abandonment, lack of nurturance, or lack of emotional availability (Centers for Disease Control and Prevention, 2007; National Research Council, 1993).

1.1.2 Assessment

Three main methods of assessing the occurrence of CM are use of child protection service (CPS) agency data, interviews, and self-report. CPS agencies rely upon referrals alleging that children have been abused or neglected. Approximately one-third of referrals to CPS agencies are screened-out and do not receive further attention. The reasons a referral may be screened-out include issues that are outside the responsibility of the CPS, insufficient information to enable follow-up, and agency workload. The remaining two-thirds of referrals are screened-in as official CPS reports. More than half of official CPS reports are made by professionals, including educators, legal and law enforcement personnel, social services personnel, medical personnel, mental health personnel, child daycare providers, and foster care providers. Such professionals are mandated by law to report any suspected abuse. Non-professional reporters often include parents, other relatives, friends and neighbors, alleged victims, alleged perpetrators, or anonymous callers (U.S. Department of Health and Human Services, 2005).

There are several potential biases associated with CPS data. These include under-representation of minor forms of maltreatment, under-representation of forms of maltreatment that do not result in physical injury, over-representation of low socioeconomic status populations, and potential over-representation of certain racial/ethnic groups due to the personal bias of reporters or CPS staff (National Research Council, 1993).

In order to minimize potential biases in research studies, the majority of maltreatment data is obtained through interviews or self-reports. In addition, because of ethical and legal concerns with regard to reporting and intervening on known or suspected maltreatment, most maltreatment research data are obtained retrospectively. Interview data on CM are usually

obtained through structured or semi-structured interview with the victim. Victim interview data can be supplemented with sibling, parent, or other informant interviews. Most interviews assess multiple forms of maltreatment, as well as other childhood traumatic events, simultaneously (Roy & Perry, 2004). The reliability and validity of interviews and questionnaires in retrospectively assessing CM are within acceptable ranges and have been shown to be comparable (Hardt & Rutter, 2004).

1.1.3 Epidemiology

Estimates of the prevalence of CM vary depending upon data source and the forms of maltreatment that are measured. Estimates based upon CPS data often underestimate cases of emotional abuse or neglect (Cicchetti & Toth, 2005). The accuracy of prevalence estimates from research studies is limited by a tendency to focus on a single form of maltreatment (e.g. sexual abuse), or on the larger categories (e.g. any neglect) (Cicchetti & Toth, 2005; Dong, Anda et al., 2004). Furthermore, research samples may under-represent more severe cases of maltreatment due to their reliance on self-report (Cicchetti & Toth, 2005).

The National Incidence Study (NIS), conducted by the National Center on Child Abuse and Neglect, supplements CPS data with those from other investigatory agencies, professionals in schools, and hospitals. Based upon the most recent NIS study, 23.1 per 1000 children under the age of 18 were victims of maltreatment. The rates of any form of abuse (physical, sexual, or emotional) and neglect (physical or emotional) were 11.1 and 13.1 per 1000, respectively. The majority of cases were physical maltreatment, abuse and/or neglect (Sedlak & Broadhurst, 1996). Other research indicates that neglect accounts for approximately half of all CM (Elliott & Urquiza, 2006; U.S. Department of Health and Human Services, 2005).

Estimates obtained in research studies of community samples are much higher. For instance, in the National Family Violence Survey, a national telephone survey of adults in households with at least one child under age 18, the reported prevalence rate for physical abuse was 49 per 1000 (Straus MA, Hamby, Finkelhor D, Moore, & Runyan, 1997). It is important to note that the rates in this study are based on reports from perpetrators of the maltreatment, or their partners, and therefore, may underestimate rates of CM. A more recent study of children and youth, ages 2 to 17, revealed 124 per 1000 reported having experienced some form of maltreatment. The rates of physical abuse and any form of neglect among the same sample were 15 per 1000 and 11 per 1000, respectively (Finkelhor, Ormrod, Turner, & Hamby, 2005).

Many studies on CM and its sequelae focus on a single CM type. However, multiple studies have demonstrated that exposure to a single form of CM is uncommon (Bensley, Van Eenwyk, & Simmons, 2000; Briere & Runtz, 1990; Dong, Anda et al., 2004). For example, in the Adverse Childhood Experiences Study of adults from a health management organization (n=8,629), 86.5% reported having experienced at least one additional adverse childhood experience (ACE), which included maltreatment as well as household dysfunction. At least three additional ACEs were reported by 52% of the same study population. When non-maltreatment ACEs (e.g. household dysfunction) were excluded, the odds for having experienced an additional form of abuse or neglect given the occurrence of one form ranged from 2.4 to 17.7 ($p<.0001$) (Dong, Anda et al., 2004).

1.1.3.1 Racial differences in occurrence of childhood maltreatment

Data on race/ethnicity and CM also vary considerably depending upon the source. National data based on CPS reports estimate rates of any maltreatment among African Americans and Native Americans at 20.4 per 1000 and 21.3 per 1000. In contrast, the rates for

Caucasians, Latinos, and Asians were 11.0, 9.9, and 2.7 per 1000, respectively (U.S. Department of Health and Human Services, 2005). However, as the majority of abuse is not reported to the police or other agencies, all of these rates are likely underestimates (Finkelhor, 1984; Straus & Gelles, 1990b). Differential reporting of CM by race may account for a large proportion of the variation in rates. In fact, data from the National Incidence Studies revealed no significant differences in the prevalence of abuse across ethnic groups (Sedlak & Schultz, 2001).

Using self-report data from adults aged 18 and older, Scher et al., (2004) found that Caucasians were two times more likely than African Americans to report histories of emotional abuse and neglect, while African Americans were 1.5 times more likely than Caucasians to report a history of physical abuse (Scher, Forde, McQuaid, & Stein, 2004). Adult retrospective reports of physical abuse were higher among African Americans compared to Mexican Americans, Native Americans, and non-Hispanic whites (Roosa, Reinholtz, & Angelini, 1999).

Race/ethnicity is important with regard to the prevalence and reporting of CM. This is particularly true when considering CPS data, as there is increasing evidence of overrepresentation of ethnic minorities in the child welfare system (Elliott & Urquiza, 2006). Race/ethnicity likely contributes to institutional-level differences in the manner in which maltreatment is reported and substantiated within the CPS system. Racial/ethnic factors may also affect whether victims report abuse that has occurred as well as how they cope with abuse (Rau et al., 2003). Additionally, there is evidence of differences in the degree of restrictive or punitive interventions (e.g. mandated parenting classes, removal of children from the home) mandated following CM depending upon the race/ethnicity of the family (Elliott & Urquiza, 2006).

1.1.3.2 Individual-level socioeconomic differences in occurrence of childhood maltreatment

In 2002, the U.S. poverty rate for families with children under 18 years was 13.6%. The percentages of Caucasian and African American children living below the poverty level were 9.5 and 32.3, respectively (Proctor & Dalaker, 2003). The association between child maltreatment, particularly neglect, and low income levels is well established (Ards, Chung, & Myers, 1998; Drake & Pandey, 1996; Gil, 1970; Hampton & Newberger, 1985; Lindsey, 1994 ; Waldfogel, 1998; Wolfner & Gelles, 1993; Zellman, 1992). Berger (2005) found that income played a more important role in child maltreatment in single-parent families than in two-parent families (Berger, 2005). In general, single-parent families below 200% of the poverty level have much higher probabilities of family violence. This is thought to be indirectly related to stress, among other variables, although Berger (2005) did not find respondent stress to be significant predictor of violence. Covariates of maltreatment identified in this study included: single parent status, depression, maternal alcohol consumption, and history of family violence (Berger, 2005). In their longitudinal study, Dunlap et al. (2003) found that inner-city, low-income girls with histories of childhood sexual abuse were at high risk for school dropout, limited involvement with jobs, drug abuse, teen pregnancy, early motherhood, multiple children by different fathers, being single-parents, and being involved in prostitution, all of which increase the likelihood of perpetuating poverty (Dunlap, Golub, & Johnson, 2003). This study illustrates the importance of exploring the relationships between income, race, child maltreatment, and subsequent outcomes. The few studies of child maltreatment that mention income include it as a predictor of occurrence. Most do not examine income as a correlate of negative outcomes, nor do they examine income in conjunction with race.

1.1.3.3 Neighborhood-level socioeconomic differences in occurrence of childhood maltreatment

In the past decade, several multi-level studies of parenting, child outcomes, and child maltreatment have been conducted (Caughy, O'Campo, & Muntaner, 2003; Coulton, Korbin, & Su, 1999; Korbin, Coulton, Lindstrom-Ufuti, & Spilsbury, 2000; Molnar, Buka, Brennan, Holton, & Earls, 2003; Silk, Sessa, Morris, Steinberg, & Avenevoli, 2004). The most common approach to defining neighborhoods has been to utilize census tracts and/or census blocks. A consistent finding is that neighborhood can affect child adjustment, development, and behavior through its effects on factors such as parenting, family environment, or stress. Molnar et al. (2003) examined both family- and neighborhood-level socioeconomic disadvantage and found an association between both forms of disadvantage and parent-to-child physical aggression (Molnar et al., 2003). Interactions between race, size of neighborhood social networks, and use of physical aggression were also found. Few, if any, similar studies have explicitly examined the correlation between neighborhood and long-term outcomes of multiple forms of maltreatment. Neighborhood level factors may be independently associated with child maltreatment outcomes or they may only be important as proxies for race or socioeconomic status. Understanding the degree and nature of neighborhood influences on outcomes following CM may allow the development of more accurate risk profiles for victims, and may inform efforts at prevention.

1.1.4 Etiology

There are many etiologic models of CM. Most of the current models propose interactions among causal or predisposing factors internal and external to the victim (Ammerman, 1990; National Research Council, 1993). The most prominent models are based upon Bronfenbrenner's

ecological model (Belsky, 1980). In ecological models, maltreatment is viewed within a system of risk and protective factors on four nested levels: 1) individual or ontogenic, 2) family microsystem, 3) exosystem, and 4) social macrosystem. Individual/ontogenic factors are characteristics of the adult or child such as demographics, personality, temperament, or age. Characteristics of the family microsystem that may be important in the etiology of CM can include family functioning (e.g. marital discord, parent illness or absence), parenting style, or discipline methods. The exosystem refers to the larger community that surrounds the family and the individual. Community factors can include the neighborhood, workplace, school, peer groups or religious organizations. The macrosystem is comprised of cultural and social values which influence all other levels of the ecologic model. Examples of such values include individuals' and families' rights to privacy, or norms of certain levels of physical discipline (National Research Council, 1993).

1.1.5 Outcomes

Childhood maltreatment has a variety of impacts on its victims, both psychological and physiologic. The nature, severity, and longevity of the impacts vary depending upon the type(s) of maltreatment experienced, duration of maltreatment, as well as characteristics of the individual and family which may intensify or buffer the effects of abuse/neglect. There are two prominent approaches to understanding the mechanisms of change in victims of maltreatment, developmental psychopathological and neurobiological.

1.1.5.1 Developmental psychopathological mechanism

The basic tenet of developmental psychopathology is that normal child development follows a predictable course, which begins with physiological regulation of functions like eating and sleeping, followed by development of closeness and attachment to others, peer relationships, and social competence (Wolfe, 1999). Under adverse circumstances, such as CM, these processes are disrupted resulting in impairments which can persist into adulthood.

Impacts on every stage of development, from infancy and early childhood to adulthood have been demonstrated in the research literature. For example, in early childhood (birth to age 6) characteristics found to be associated with CM include: delayed motor development and higher rates of enuresis, insecure attachment, social withdrawal, disturbed peer relationships, and decreased ability to engage in problem solving, deduction and complex memory tasks (Trickett & McBride-Chang, 1995). In middle childhood (ages 6-12), some of the observed changes in maltreated individuals include the emergence of academic performance deficits, low peer status, inappropriate sexual behavior, as well as internalizing and externalizing behavior problems (Trickett & McBride-Chang, 1995). In adolescence, the changes observed in middle childhood are found to persist and escalate. Internalizing and externalizing problems lead to a higher likelihood of suicide or self-injurious behavior, delinquency, multiple sex-partners, running away and a higher likelihood of repeating a grade in school. In adulthood, the final stage in the developmental pathway, early social and psychological problems often culminate in criminal activity, psychiatric disorders, social isolation, decreased marital success and satisfaction (Trickett & McBride-Chang, 1995).

1.1.5.2 Neurobiological mechanism

Neurobiological impacts of CM include changes in the neurohormonal system as well as in the structure and function of specific regions of the brain. Major structural changes in the brain associated with early stress and CM include reduced size of the corpus callosum, and attenuated development of the hippocampus, amygdala, cerebral cortex, and cerebellum. Some of the related functional changes are increased amygdaloid activation, which is associated with heightened emotional memory and post-traumatic stress disorder. Changes in hippocampal volume impact the behavioral inhibitory system and retrieval of episodic information; suggesting these changes may be related to dissociative and disinhibitory behaviors. Cerebellar changes have been found to be associated with disruptions in cognition, language, social behavior, emotion and several psychiatric disorders (Teicher et al., 2003).

The neurohormonal changes most studied in relation to CM occur in the hypothalamic-pituitary-adrenal (HPA) axis. The HPA axis, which involves the sympathetic nervous system, neurotransmitter system, and immune system, controls the body's response to stress. Research results are mixed with some studies showing raised levels of the stress hormone cortisol, which activates the HPA axis; while others show normal levels of cortisol, suggesting adaptive functioning (Glaser, 2000). Increases in stress hormone levels are associated with numerous physical and psychological outcomes which will be discussed further below.

1.1.5.3 Physical outcomes of childhood maltreatment

The most obvious physical effects of CM include scars from burns, bites, scratches, or being struck with instruments like belts or whips. Mental retardation, seizures, blindness, deafness, cerebral palsy, or learning disabilities are additional sequelae associated with severe physical abuse. Sexually abused children are also at increased risk for sexually transmitted

diseases. Neglect, particularly medical, can also have physical impacts on children, including limb and vertebral deformity or stunted growth due to failure to seek medical attention for fractures. Speech disorders, developmental delays, and decreased visual acuity or blindness can result from failure to attend to hearing or vision problems. Severe malnutrition resulting from extreme physical neglect can also result in stunted growth (National Research Council, 1993; Rosenberg & Krugman, 1991).

Many of the physical outcomes, like scars or other physical deformities, persist throughout the victims' lifetime while others may lead to secondary outcomes as the child moves into adolescence and adulthood. For instance, untreated sexually transmitted diseases in children who contract the infections from abusers can lead to pelvic inflammatory disease and infertility (MacMillan & Munn, 2001; Rosenberg & Krugman, 1991). Other physical outcomes of CM do not manifest until later in life. For example, somatic disorders, irritable bowel syndrome, chronic fatigue syndrome, and autoimmune disorders like rheumatoid arthritis, have all been found to be related to a history of CM but usually are not present at a diagnosable level until adulthood (Arnow, Hart, Hayward, Dea, & Taylor, 2000; Kendall-Tackett, 2000; Mulvihill, 2005; National Research Council, 1993). These adult outcomes are likely more closely associated with neurobiological mechanisms such as changes in the HPA axis (Kendall-Tackett, 2000). There is also evidence that cardiovascular disease may be related to a history of CM, with individuals exposed to more forms of maltreatment at highest risk (Batten, Aslan, Maciejewski, & Mazure, 2004; Dong, Giles et al., 2004)

1.1.5.4 Psychosocial outcomes of childhood maltreatment

The psychosocial consequences of maltreatment during childhood include internalizing problems, such as emotional disturbances, sleep and eating disturbances, fears and phobias, guilt,

shame, or depression. Externalizing problem behaviors that are seen among maltreated children include running away, aggression, and inappropriate sexual or antisocial behavior (National Research Council, 1993). Similar problems are seen as maltreated children move into adolescence and adulthood. Externalizing behaviors may escalate into delinquency or violence during adolescence. Substance use and substance use disorders as well as other self-destructive behaviors, suicide, and psychiatric disorders begin to emerge during this time period as well. In addition to the emergence or escalation of substance use and psychiatric disorders like depression, anxiety, and post-traumatic stress disorder, adults with histories of CM often have problems in interpersonal relationships. This can include a higher likelihood of walking out on a partner, divorcing, being unfaithful to a romantic partner, or being revictimized (Colman & Widom, 2004; Gladstone et al., 2004; National Research Council, 1993).

1.1.5.5 Other outcomes of childhood maltreatment

Abused and maltreated individuals have been shown to exhibit cognitive and language deficits, particularly in verbal intelligence (National Research Council, 1993). In addition, through high school, maltreated children have been shown to perform significantly lower on standardized tests, have lower grades and are more likely to repeat a grade (Eckenrode, Laird, & Doris, 1993). There is also evidence that lower levels of intellectual functioning and academic failure that can occur among victims of CM persist into adulthood (Malinosky-Rummell & Hansen, 1993; Perez & Widom, 1994).

1.2 VIOLENCE AGAINST WOMEN

1.2.1 Definition

Violence against women (VAW) is an important public health issue in the United States. VAW is considered a subset of interpersonal violence, which can be defined as the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community (e.g. women) that has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002). The World Health Organization Report on Violence and Health (2002) identifies four types of VAW: physical, sexual, psychological, and deprivation or neglect. This violence can occur at the family level where it is usually perpetrated by intimate partners, current or former. It can also occur at the community level and be perpetrated by acquaintances or strangers.

Intimate partner violence (IPV), a specific subset of VAW, is defined as any behavior within an intimate relationship that causes physical, psychological, or sexual harm to those in the relationship. This includes psychological abuse, forced intercourse, other forms of sexual coercion, and controlling behaviors such as isolating a person from friends and family, monitoring one's movements, and restricting one's access to information or assistance (Heise & Garcia-Moreno, 2002). This frequently used definition of IPV only includes physical violence committed against women within the context of intimate partner relationships.

1.2.2 Assessment

Data on IPV/VAW can come from a variety of sources, including police, clinical settings, non-governmental organizations, and research. However, most VAW incidents are not reported to the police. It is estimated that only 20% of IPV rapes or sexual assaults, 25% of physical assaults, and 50% of stalkings directed toward women are reported to officials (Centers for Disease Control and Prevention, 2007). Hence, self-reports of victimization are heavily relied upon in research.

The most commonly employed self-report methods are questionnaires, face-to-face interviews, and telephone surveys (Cusack, Frueh, & Brady, 2004; Schwartz, 2000). Telephone surveys have been used increasingly in recent years, including their use in the National Violence Against Women Survey and the National Crime Victimization Survey. Face-to-face surveys, though considered to be the best method for gathering data in many subject areas, can be problematic when sensitive subjects such as CM or VAW are considered. Due to embarrassment or shame, women can be less forthcoming in face-to face interviews (Schwartz, 2000). However, less personal interview methods like telephone surveys, particularly those which employ random-digit dialing sampling, have the additional limitation of potential biases in response rates (Schwartz, 2000). In telephone surveys, no data are available on individuals who refuse to take part. Certain demographic groups or those who are in more volatile home situations may participate differentially.

Two commonly used VAW self-report questionnaires are the Conflict Tactics Scale (CTS) and the Trauma Assessment for Adults (TAA). The major limitation of the CTS is that it only assesses violence occurring in the context of intimate relationships. The TAA assesses lifetime history of traumatic events including physical and sexual assaults, and emotionally

traumatic events such as being in situations where one feared being killed or seriously injured. While the TAA is a more inclusive assessment of the range of victimization women experience, it does not allow the researcher to distinguish between victimization within and outside of the context of intimate relationships.

1.2.3 Epidemiology

It is estimated that 14-20% of women will experience rape. (Kilpatrick & Resnick, 1993; Koss, 1993; Tjaden & Thoennes, 2000a, 2000b), 52% will experience physical assault (Tjaden & Thoennes, 2000a, 2000b), and 8-24% will be stalked during their lifetime (Sheridan, Blaauw, & Davies, 2003; Spitzberg, 2002; Tjaden & Thoennes, 2000a, 2000b). Estimated annual victimization rates for women are 8.7 per 1000, 58.9 per 1000, and 10.0 per 1000 for rape, physical assault, and stalking, respectively (Tjaden & Thoennes, 2000a). When considering victimization occurring as adults (age ≥ 18), 9.6% of women reported having been raped, 30.6% physically assaulted, and 7.4% stalked (Tjaden & Thoennes, 2000a).

Only 16-20% of violence against women occurs at the hands of strangers (Kaukinen, 2004; Tjaden & Thoennes, 2000a, 2000b). In fact, women are more likely to be assaulted or killed by a male partner, current or former, than any other type of assailant (Browne, 1993; Browne & Williams, 1993; Schnitzer & Runyan, 1995; Tjaden & Thoennes, 2000a, 2000b). U.S. survey research over the last 25 years indicates that approximately 20% of all couples among the general population have had at least one occurrence of IPV (Field & Caetano, 2005). It is also estimated that 25-28% of women will be physically abused by an intimate partner (Elliott & Briere, 2003; Straus & Gelles, 1990a). Results from the National Violence Against Women Survey indicate that perpetrators of VAW are predominantly male. All rapes reported

against women as adults as well as 91.9% of physical assaults in adults, and 97.2% of adult stalking incidents were perpetrated by males (Tjaden & Thoennes, 2000a).

As in the CM research literature, the approach to IPV/VAW research has been fragmented. In many cases, research has focused on one type of violence women experience, without considering the potential for multiple exposures (Kilpatrick, 2004). Women who present with one form of victimization often have a history of previous victimization. This was illustrated in a study by Monnier, Resnick, Kilpatrick, and Seals in which a sample of recent rape victims was examined (2002). Thirty-six percent of these women had been victims of previous domestic violence, 60% had been victims of prior rape, and 17% sustained a new physical assault within 6-months of the initial assault. Of the subsequent assaults, 37% were perpetrated by someone other than an intimate partner. Such evidence of the co-occurrence of forms of VAW is found in general population and service-seeking samples (Kilpatrick, 2004).

1.2.3.1 Racial differences in IPV/VAW

In nationally representative studies, African Americans have consistently been found to have higher reported rates of partner abuse, and to be between 1.6-2.4 times more likely to report violence compared to Caucasians (Caetano, Cunradi, Clark, & Schafer, 2000; Coulton et al., 1999; Hampton & Gelles, 1994; Rennison & Welchans, 2000; Sorenson, Upchurch, & Shen, 1996; Tjaden & Thoennes, 2000b; West, 2004). African Americans seem to be at significantly greater risk of IPV even after controlling for other factors such as substance use and socioeconomic characteristics (Caetano et al., 2000; Field & Caetano, 2005). Gelles (1993) and Cunradi et al. (2002) also found that severity of IPV differed by ethnicity, where moderate violence consisted of things like pushing, shoving, grabbing, and/or slapping and severe violence consisted of kicking, biting, hitting with an object or hand, choking, burning, scalding, sex

and/or threatening with or using a knife or gun. African American and Hispanic couples were at 4-fold and 2-fold increased risks, respectively, for severe IPV compared to Caucasian couples (Cunradi, Caetano, & Schafer, 2002; Gelles, 1993; Jasinski, Asdigian, & Kaufman-Kantor, 1997).

Race and ethnicity have been shown to be among the most consistent predictors of a person's risk for any violence, with highest rates of violent victimization in African Americans and Latinos. In fact, African American females have been found to have significantly higher rates of nonstranger (e.g. family, friend, or acquaintance) violence than Latino and Caucasian women. African American and Latino women also experience significantly higher rates of stranger violence (Lauritsen & White, 2001).

These studies illustrate significant differences in violent victimization by race/ethnicity. These findings also raise the question of whether risk factors for victimization also differ by race/ethnicity. In general, findings from multiple longitudinal and cross-sectional studies indicate that generalizing the risk factors associated with IPV across race/ethnic groups may not be appropriate (Field & Caetano, 2003).

1.2.3.2 Individual-level socioeconomic differences in IPV/VAW

Violence is an important public health problem for impoverished women (Bassuk et al., 1996; Goodman, Dutton, & Harris, 1995). This is especially true for partner violence. Poverty has been associated with increased risk for IPV victimization among women in numerous studies (Tjaden & Thoennes, 2000a; Vogel & Marshall, 2001). In a 2001 study of women receiving welfare, the prevalence rate of lifetime physical abuse by a male partner ranged from 28% to 63% (Tolman & Rosen, 2001).

Less is known about how the interaction of race and socioeconomic status (SES) impacts risk for violent victimization. Rennison and Planty (2003) stated that racial differences in rates of partner abuse disappear or are attenuated when economic factors are taken into consideration (Rennison & Planty, 2003). However, several studies of low-income populations have reported significant racial differences in the predictors of IPV. Among African American women, earning lower incomes and living in rental housing have been independently associated with higher rates of IPV (Campbell, Sharps, Gary, Campbell, & Lopez, 2002). Such associations have not been reported in the literature for Caucasian women.

In addition to differences in risk of occurrence, there is evidence that low income women may be victims of more frequent IPV (Goetting, 1995; Jasinski et al., 1997). Two studies analyzed IPV risk for low income women and identified factors similar to those found in the general population of women, such as poor social support, psychological distress, or history of child maltreatment (Centerwall, 1995; Wenzel, Tucker, Elliott, Marshall, & Williamson, 2004). However, none of these studies of income and IPV accounted for race, maltreatment, and neighborhood factors simultaneously.

1.2.3.3 Neighborhood-level socioeconomic differences in IPV/VAW

In addition to individual level characteristics such as race and income, personal and neighborhood environmental factors, such as social support, unemployment rates, crime rates, poverty rates, and home ownership ratios, may also be correlates of IPV victimization (O'Campo et al., 1995; Smith & Jarjoura, 1989). Couples who are urban dwellers have been found to report more IPV, particularly if African American (Cunradi, Caetano, Clark, & Schafer, 2000). This suggests that economic or social disadvantage may increase the risk of IPV (West, 2004). Associations have been found between characteristics of couples' socioeconomic environment,

such as neighborhood level poverty, and IPV (Fox & Benson, 2006). These associations have also been more pronounced for African Americans (Campbell, Masaki, & Torres, 1997; Cunradi et al., 2000).

Although neighborhood-level SES is consistently a significant risk factor for IPV/VAW, it has not been examined as extensively as individual-level SES. In addition to increasing individual risk for adverse socioeconomic outcomes, violent victimization may also increase risk for living in areas of high socioeconomic disadvantage. This relation has not been examined, thus far.

1.2.4 Etiology

Etiologic models of VAW/IPV are similar to the ecological models of CM. Risk and protective factors for victimization exist on separate, interacting levels, including the individual, relationship, and context/situation (Tolan, Gorman-Smith, & Henry, 2006). Individual risk factors might include low self-esteem, while examples of relationship and contextual factors are communication effectiveness and disadvantaged neighborhood residence, respectively (Tolan et al., 2006).

1.2.5 Outcomes

Similar to childhood maltreatment, adult violent victimization can have psychological and physical impacts on its victims. In addition, there are several related sociologic outcomes.

1.2.5.1 Psychological impacts of IPV/VAW

There are numerous mental health correlates of physical and/or sexual victimization, including anxiety (Gleason, 1993; Kemp, Green, Hovanitz, & Rawlings, 1995), depression (Campbell, Sullivan, & Davidson, 1995; Gleason, 1993; Orava, McLeod, & Sharpe, 1996; Plichita & Weisman, 1995), hopelessness and low self-esteem (Janoff-Bullman, 1992), post-traumatic stress (Astin, Lawrence, & Foy, 1993; Kilpatrick & Resnick, 1993), dissociation (Briere, Woo, McRae, Foltz, & Sitzman, 1997), somatization (Ullman & Brecklin, 2002), sexual problems (Briere, Elliott, Harris, & Cotman, 1995), substance use (Epstein, Saunders, Kilpatrick, & Resnick, 1998; Kilpatrick et al., 2000; Martin, Kilgallen, Dee, Dawson, & Campbell, 1998), and suicidality (Golding, 1999; Thompson, Kaslow, & Kingree, 2002; Ullman & Brecklin, 2002). Similar correlates have been identified for stalking and other forms of emotional or psychological abuse (Davis, Coker, & Sanderson, 2002; Mechanic, 2002; Migeot & Lester, 1996; Pathe & Mullen, 1997; Vitanza, Vogel, & Marshall, 1995).

1.2.5.2 Physical impacts of IPV/VAW

The physical effects of violent victimization on women can be immediate or long-term. Some of the immediate health impacts include minor injuries such as scratches, bruises or welts, or more severe injuries like lacerations, knife wounds, broken bones, head and internal injuries, broken teeth, burns, or bullet wounds (Plichta, 2004; Tjaden & Thoennes, 2000a, 2000b).

The long-term effects can be direct or indirect. Examples of direct health effects of IPV/VAW victimization are traumatic brain injury due to frequent, severe blows to the head. Other outcomes related to strangulation or head trauma include dizziness, left-or right-side weakness, paralysis, headaches, and memory loss. Chronic pain, particularly that associated with disorders such as fibromyalgia, temporomandibular joint disorder, and gastrointestinal disorders

has also been found among IPV victims (Plichta, 2004). The long-term indirect health effects of IPV/VAW are related to poor health behaviors like high rates of smoking, drug and alcohol use, poor diets, unhealthy weight control behaviors (e.g. vomiting, use of laxatives), risky sex practices (e.g. failure to use condoms), and failure to receive adequate prenatal care (Plichta, 2004). Some associated problems are pregnancy difficulties like low birthweight or perinatal death, sexually transmitted diseases including HIV/AIDS, and heart or circulatory diseases (Centers for Disease Control and Prevention, 2007).

1.2.5.3 Sociologic impacts of IPV/VAW

As a result of victimization, women often face a number of social consequences, including restricted access to information and services, isolation from social networks, and strained interactions with health providers and employers (Heise & Garcia-Moreno, 2002; Plichta, 2004). Research on female children and adolescents has demonstrated the adverse effect of violent victimization on educational and socioeconomic attainment well into early adulthood (Macmillan, 2001). In addition, young adults with histories of victimization have lower educational attainment and lower occupational status as measured by income.

One population based study of 3,600 women demonstrated a significant association between experiencing IPV in the previous year and housing instability; which included difficulty paying rent, mortgage or utility bills, frequent moves, and living in overcrowded conditions with family or friends (Pavao, Alvarez, Baumrind, Induni, & Kimerling, 2007). Experiencing such adversity may increase women's likelihood to return to, or remain in, relationships with an abusive partner.

1.3 REVICTIMIZATION

1.3.1 Definition

Revictimization occurs when an individual who has suffered childhood or adolescent abuse or neglect subsequently suffers one or more forms of victimization as an adult. The adult victimization (revictimization) can occur at the hands of an intimate partner, a non-intimate acquaintance, or a stranger. Revictimization can be form-specific (e.g. adult sexual victimization following childhood sexual abuse) or non-specific (e.g., any adult victimization following any form of childhood maltreatment). In addition, revictimization can be an isolated or recurring event.

1.3.2 Epidemiology

Many researchers have noted that a history of childhood maltreatment is a risk factor for subsequent victimization, including IPV/VAW (Coid et al., 2001; Messman-Moore & Long, 2002; Schaaf & McCanne, 1998; Whitfield, Anda, Dube, & Felitti, 2003; Widom, 1997). These studies have largely examined specific forms of child maltreatment, most commonly physical or sexual abuse, as predictors. One meta-analysis revealed between 15% and 79% of female victims of childhood sexual abuse report adult sexual assault (Roodman & Clum, 2001). The wide variation in the estimates of revictimization rates is likely due to several factors, including differences in the study population (e.g. sample size, age, community vs. clinical), differences in definitions of child and adult victimization, and differences in questionnaires (e.g. number or wording of questions).

An analysis of National Violence Against Women Survey (2002) data yielded estimates of the risk of both specific and non-specific revictimization at the hands of intimate partners as well as by any perpetrator. After adjustment for age, race, ethnicity, education, employment status and marital status, women who were physically abused during childhood were 2.8 times more likely to experience adult physical victimization and 2.6 times more likely to experience adult sexual victimization by an intimate partner. Those women who experienced childhood sexual abuse were 2.3 times more likely to experience adult physical victimization and 1.1 times more likely to experience adult sexual victimization by an intimate partner. Those women who experienced childhood sexual abuse were 1.3 times more likely to experience adult physical victimization and 3.0 times more likely to experience adult sexual victimization by a non-intimate partner. In addition, those who experienced childhood physical abuse were 3.0 times more likely to experience adult physical victimization and 2.7 times more likely to experience adult sexual victimization by a non-intimate partner. (Desai, Arias, Thompson, & Basile, 2002). In the same study, women who experienced both childhood physical and sexual abuse were between 1.8 times more likely to experience adult physical victimization and 4.8 times more likely to experience adult physical or sexual victimization (Desai et al., 2002).

1.3.2.1 Racial differences in occurrence of revictimization

Schafer et al. found racial differences in the relationship between child maltreatment history and IPV (Schafer, Caetano, & Cunradi, 2004). Among African American females, a history of childhood physical abuse increased the likelihood of reporting IPV victimization. Urquiza and Goodlin-Jones found that African Americans with a history of child sexual abuse were also more likely to be raped as adults than were Caucasians, Latina, or Asian women with similar abuse histories (Urquiza & Goodlin-Jones, 1994).

1.3.2.2 Socioeconomic difference in occurrence of revictimization

Very few studies have examined socioeconomic differences, at the individual or community level, in the relation between childhood maltreatment and subsequent adult victimization. One study of low-income African American women showed that current social support mediated the relation between child maltreatment and adult IPV (Wenzel et al., 2004). This study illustrates an additional shortcoming in the literature, studies of socioeconomic differences in revictimization have generally been conducted in racially homogeneous populations and/or only account for individual level SES (Bender, Cook, & Kaslow, 2003). Little is known about how SES impacts risk for revictimization among non-African American populations. Likewise, it is not known whether risk for revictimization varies depending upon characteristics of the neighborhood in which one resides.

One conceptualization of the influence of the neighborhood on interpersonal violence is social disorganization. Social disorganization is a lack of social order, which is defined as a relatively stable system of institutions, pattern of interactions and customs, capable of continually reproducing at least those conditions essential for its own existence (Shaw & McKay, 1942). The concept of social order thus refers to the aspects of a society which remain relatively constant over time.

Social disorganization theory suggests that neighborhoods plagued with poverty and economic deprivation tend to experience high rates of population turnover. This, in turn, leads to failure of informal social structures, such as schools, families, churches, or law enforcement, which in turn lead to difficulties to maintaining social order. There is evidence of a direct relation between neighborhood social disorganization and intimate partner violence against

women (Benson, Greer, DeMaris, & Van Wyk, 2003; Browning, 2002). However, these studies have not taken prior victimization, especially childhood maltreatment, into consideration.

1.3.3 Etiology

There are few published etiologic models of revictimization. Similar to CM and IPV/VAW, a commonly used etiologic conceptualization of revictimization is an ecological one with risk and protective factors on several interactive levels. An example is an adaptation of Bronfenbrenner's ecological model (Bronfenbrenner, 1977) to sexual revictimization. In this model, sexual revictimization is a function of the victim's personal history (e.g. childhood sexual abuse), the context or relationship in which the revictimization occurs (e.g. substance use by either partner), the community (e.g. level of social support and resources), and the culture (e.g. blaming the victim) (Grauerholz, 2000).

1.3.4 Outcomes

The effects of victimization are cumulative (Classen, Field, Koopman, Nevill-Manning, & Spiegel, 2001; Follette, Polusny, Bechtle, & Naugle, 1996; Messman-Moore, Long, & Siegfried, 2000). Hence, revictimization likely has greater negative sequelae than either CM or adult IPV/VAW alone. In addition, experiencing multiple forms of CM and/or adult victimization may confer greater risk for adverse outcomes. The majority of studies conducted on the consequences of revictimization thus far have focused on physical and psychological effects of sexual revictimization.

When sexual revictimization was examined in one study, higher rates of trauma symptoms were found with increasing levels of victimization. Compared to women with no history of sexual victimization, women who experienced one, two, or three types of victimization/revictimization (childhood sexual abuse, adult sexual assault, and/or physical partner violence) were significantly more likely to report having symptoms of anxiety, depression, dissociation, sexual problems, and sleep disturbances (Follette et al., 1996).

Physical health problems have also been reported in relation to sexual revictimization. Compared to women who were sexually abused during childhood only, sexually revictimized women experienced more problems conceiving, repeated vaginal infections, sexually transmitted diseases, and painful intercourse (West, Williams, & Siegel, 2000)

Exposure to multiple forms of CM is common. There is also evidence that different forms of adult victimization co-occur. Both CM and IPV/VAW have been shown to have various long-lasting effects on the physical, mental, and social functioning of their victims. Given that the link between CM and subsequent victimization is well established, particularly for sexual victimization, improving knowledge of the cumulative effects on multiple aspects of victims' lives has important public health implications. However, there is a dearth of research on the relation between multiple forms of CM, multiple forms of IPV/VAW, and their cumulative outcomes.

1.4 SUMMARY OF LITERATURE

Women who experience CM are at increased risk for subsequent victimization during adulthood. Not all women who are victims of CM experience IPV/VAW as adults, however. Factors such as

psychological status, social support, and substance use predict a woman's vulnerability to subsequent violence victimization. Socioeconomic factors such as low educational attainment, low income, and residing in a high-poverty, high-crime neighborhood also affect whether a woman who was maltreated as a child continues to be victimized throughout her life. These same factors predict the occurrence and severity of intimate partner violence and other traumatic victimization. A few studies have examined covariates of subsequent adult traumatization such as race or neighborhood poverty among victims of child maltreatment. To our knowledge, none has addressed race, current income, and neighborhood characteristics simultaneously while also examining the relations between multiple forms of maltreatment and adult violence victimization (including, but not limited to IPV).

The current literature on child maltreatment, IPV/VAW, and the relations between them is limited by:

- 1) Focus on selected forms of maltreatment rather than multiple forms of exposure. Most large scale epidemiological studies have reported on only one or a few types of maltreatment. As stated previously, the large degree of overlap in forms of maltreatment necessitates the assessment of all forms simultaneously (Dong, Anda, Dube, Giles, & Felitti, 2003; Edwards, Holden, Felitti, & Anda, 2003).
- 2) Failure to examine race/ethnicity and socioeconomic status simultaneously in relation to maltreatment. A recently suggested approach to health disparities research is to analyze racial disparities simultaneously with (socioeconomic) class-disparities rather than treating race as a proxy for class. As suggested by Kawachi et al. (2005), interactions between race and class-based disparities should be considered whenever possible (Kawachi, Daniels, & Robinson, 2005). Additionally, Campbell et al. (2002) called for studies on SES variables

such as employment, education, poverty, single parenthood, and job type in relation to IPV (Campbell et al., 2002).

- 3) Level of approach. Most studies have either approached maltreatment from the micro-level (individual or family level) or macro-level (whole neighborhood, city, or state) without evaluating these effects simultaneously or examining the interactions between multiple forms of maltreatment and long-term sequelae of maltreatment.
- 4) Analysis of cases from Child Protective Services. Use of data from social service agencies is particularly problematic as these cases usually represent the most extreme situations and minority groups tend to be overrepresented (Scher et al., 2004; Wyatt & Peters, 1986).
- 5) Lack of standardized measures of CM. Most studies of the long-term outcomes of CM have focused on assessing the outcomes. Frequently, the assessment of CM is not done with a standardized instrument, leading to variations in the definitions of maltreatment (Lang, Stein, Kennedy, & Foy, 2004).
- 6) Focus on IPV rather than the full range of violence that women experience. Many studies that have addressed violence victimization as an outcome of CM have focused solely on intimate partner violence.
- 7) Failure to examine the cumulative impacts of CM and IPV/VAW. There is evidence that CM increases risk for being revictimized as an adult. Both forms of victimization have long-lasting physical, emotional, and social consequences. Few studies on the outcomes of the childhood and adult victimization have been conducted.

The proposed study will address some of these limitations. The Maternal Health Practices and Child Development project (MHCPD) is a longitudinal study in which all interviews are conducted in person. Data obtained in this study may be more reliable than those obtained in a

telephone or mailed survey as rapport has been developed with study participants. The dataset includes measures of race and current socioeconomic status, including current income, education, and employment. The existing data has been enhanced by linkage with census data to assess macro/neighborhood level variation in maltreatment occurrence and outcomes. The MHPCD project contains data on all forms of maltreatment. Maltreatment data were collected using the Childhood Trauma Questionnaire (CTQ), a standardized measure that simultaneously assesses multiple forms of maltreatment (Bernstein & Fink, 1998b). IPV/VAW was assessed with the Trauma Assessment for Adults-Self-Report (TAA; (Resnick, Best, Freedy, Kilpatrick, & Falsetti, 1993). These instruments provide data on a wide range of adult violent victimization including physical assault and sexual assault perpetrated by intimate partners, other acquaintances, relatives, and strangers. Both the CTQ and TAA address sexual and physical abuse. The TAA assesses lifetime experiences, while the CTQ only addresses experiences during childhood. The overlap in CM assessments on the two instruments will serve dual purposes. Using two different measures increases the likelihood that CM will be captured. Further, the TAA provides age of onset for physical and sexual assault, allowing categorization of exposures as childhood only, adult only, both.

In summary, the proposed research will contribute to the literature on the racial/ethnic and socioeconomic differences in occurrence and neighborhood-level outcomes of CM, IPV/VAW, and revictimization by addressing the limitations in the existing literature outlined above.

1.5 RESEARCH DESIGN

Data for this study are from the Maternal Health Practices and Child Development (MHPCD) study. The MHPCD project is a cohort study of the long-term effects of prenatal exposure to alcohol and marijuana. The cohort was recruited from the prenatal clinic at Magee-Womens Hospital during their first trimester of pregnancy. Women were interviewed during their fourth and seventh prenatal months. Women were interviewed with their children at delivery, 8 and 18 months, and 3, 6, 10, 14, and 16 years.

At each phase, demographic, socioeconomic, and psychological status, social and household/family environment, maternal substance use, and substance use of the male partner in the household were assessed. At the 14- and 16-year assessments, history of childhood maltreatment and exposure to violence and traumatic events were assessed. This study will utilize data from the adult women.

1.5.1 Sample size and characteristics

The study began in 1983 with a cohort of 763 women. Data from three phases, birth, 14- and 16-years, will be examined in this study. Retention rates for the MHPCD project have remained high across phases with 75% of the original cohort completing interviews at phases 14 and 16. The final sample size for this study is 477 (Table 1).

Characteristics of the study sample at each phase are shown in Table 2. The sample is representative of the low income, urban population which is served by the hospital prenatal clinic from which they were recruited. The mean monthly family income was \$358 at enrollment. By the 16-year follow-up it had risen to \$2,123. It is a racially balanced sample (46% Caucasian) at

the 14- and 16-year follow-ups. At the 16-year assessment, 45.9% of the women participating in the sample were Caucasian, and 54.1% were African American.

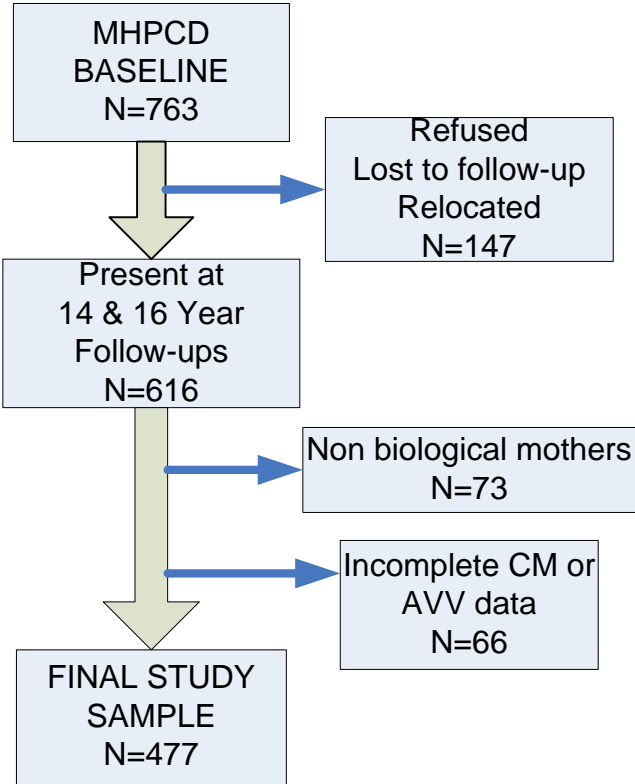


Figure 1. Sample size flow-chart

Table 1. Sample Characteristics

Subject characteristics	Birth	Phase 9 (14 year)	Phase J (16 year)
Mean age (years) (range)	23 (18-42)	38 (32-57)	40 (34-60)
Avg. family income (per mo.)	\$461	\$1887	\$2102
Race (% Caucasian)	45.9	45.9	45.9
Education (years)	11.8	12.5	12.2
Marital Status (% married)	33.5	41.1	40.9

1.5.2 Measures

Childhood victimization was measured using the Childhood Trauma Questionnaire (CTQ;(Bernstein & Fink, 1998a; Bernstein & Fink, 1998b). The CTQ is a self-report instrument that assesses exposure to physical, sexual, and emotional abuse, and physical and emotional neglect during childhood. Respondents rate each item of the questionnaire on a Likert-scale ranging from 1) Never True to 5) Very Often True. Cronbach's alpha for the five maltreatment subscales range from .66 (physical neglect) to .92 (sexual abuse); indicating good reliability (Bernstein & Fink, 1998a). Validity of the five subscales in an adult sample was also indicated through confirmatory factor analyses (Bernstein & Fink, 1998a). Suggested cut-points for determining cases of abuse/neglect were utilized to dichotomize data for each subscale (Bernstein & Fink, 1998a). Scores in the severe/extreme category on each subscale were categorized as cases; scores below this cutpoint were categorized as non-cases.

The Trauma Assessment for Adults, Self-Report Version (TAA; (Resnick et al., 1993), was used to measure adult violent victimization. Three categories of victimization will be considered in this study: sexual assault, physical assault with a weapon, and physical assault without a weapon. Age at first and last occurrence was asked for each event.

Other measures relevant to this proposal include demographic characteristics, social support, substance use, depression and anxiety, and household environment. Depression was assessed using the Center for Epidemiologic Studies-Depression measure (CES-D; Radloff, 1977). The State Trait Anxiety Index was used to assess anxiety (Spielberger, 1983). Substance use measures were developed by the MHPCD Project (Day & Robles, 1989). The MHPCD questionnaire includes items on social support, including the degree to which participants have friends and relatives who provide support. Characteristics of the participant's household, including whether there is a male living in the household, is also part of the MHPCD questionnaire at each phase.

Data on neighborhood characteristics were obtained from the U.S. Census Bureau. Census data from the year 2000 will be linked to the MHPCD data based on participants' census tracts. Aggregate, census-tract variables include: unemployment rate, educational attainment, employment type, percent owner occupied housing, percent renter occupied housing, percent below poverty level, percent elderly, percent female headed households, percent never married, child-to-adult ratio, male-to-female ratio, mean household income, percent never married, percent elderly, percent living in same house as in 1995, percent of households with social security, supplemental security income (SSI), or public assistance, percent vacant housing units, number of alcohol outlets, violent crimes, property crimes. An additional variable, number of alcohol sources per census tract was also included. Addresses for all state owned and operated

wine and spirit outlets as well as private entities licensed to sell and/or distribute alcohol (beer, wine, or liquor) were obtained from the Pennsylvania Liquor Control Board (PLCB). Once the addresses were linked to census tracts, the number of alcohol sources was tallied for each census tract. Census tract specific crime data was obtained for a subset of the study sample from the National Archive of Criminal Justice Data (Cohen & Gorr, 2005). Three crime indexes were used; violent crime index (arson, criminal mischief, disorderly conduct, simple assault, drug calls, shots fired), other violent crimes (aggravated assault, murder/manslaughter, negligent manslaughter, rape, robbery), and property crimes (burglary, larceny, motor vehicle theft, robbery). Because the study from which crime data were obtained was conducted in the city of Pittsburgh, these data was only available for a subset of our sample residing in Pittsburgh.

1.5.3 Analyses

All data management and analyses were conducted using the statistical package SPSS 14.0 ("SPSS for Windows, Rel. 14.0.1," 2005). As an initial step, each variable was examined using frequency tables, histograms, and measures of central tendency and dispersion. Data was examined to ensure the following assumptions are met: non-multicollinearity/singularity among the independent variables, linearity between the independent variables and the logit, and lack of outliers and influential cases.

Table 2. Measures

Study Measures
Childhood victimization: sexual/physical/emotional abuse, physical/emotional neglect
Adult victimization: sexual assault, physical assault (with/without weapon)
Demographics: race, family income, marital status, employment status
Psychiatric/Substance use characteristics: alcohol use, cigarette use, marijuana use, cocaine use, other drug use, depression, anxiety
Social/Environmental Characteristics: social support, number living in household, household structure
Neighborhood characteristics: poverty, public assistance, social & supplemental security income, unemployment, occupation type, education, female headed households, age, housing stability, childcare burden, vacant, rented, owner-occupied housing, alcohol outlets, crime

AIM 1: To determine whether history of CM predicts adult IPV/VAW in this cohort.

The outcome variable was self-report of IPV/VAW, which was analyzed dichotomously. The predictor was whether women report a history of CM. History of CM was analyzed dichotomously and as a composite variable based on suggested cut-points for moderate/severe versus other levels of physical abuse, sexual abuse, physical neglect, emotional abuse, and emotional neglect (Bernstein & Fink, 1998).

The composite exposure variable allowed examination of the impact of multiple forms of maltreatment on the outcome and potentially to determine whether there is a dose-response relation between exposures and the outcome.

Binary (using the dichotomous exposure variable) and multinomial (using the composite exposure variable) logistic regressions were conducted. Using both dichotomous and multinomial representations of CM allowed dose-response relationships to be examined. Furthermore, multinomial logistic regression avoids the potential loss of statistical power resulting from collapsing categories for dichotomization.

To identify covariates significantly associated with the exposure or outcome, bivariate analyses, Student's t-tests for continuous variables, and Chi-square test for categorical variables, were used. Variables identified in bivariate analyses were entered, stepwise, as covariates in logistic regression models.

AIM 2: Racial differences in the association between CM and IPV/VAW were examined in three steps. First, racial differences in self-reported CM and IPV/VAW were examined with separate simple regressions of race as the exposure and CM and IPV/VAW as the outcome. Next, to examine racial differences in rates of revictimization, cases who reported CM were selected. Among this subset, a regression was performed with race as the exposure and self-reported revictimization (report of having both CM and IPV/VAW) as the outcome. The third step was to test for moderated mediation. That is, to examine whether there are race differences in the mediators in the relation between CM and IPV/VAW. In this step the sample was split and analyzed separately, by race. Bivariate analyses to identify significant covariates was followed by logistic regression. Mediation of the effect of CM on IPV/VAW by any significant covariates was tested using the Baron and Kenny method (Baron & Kenny, 1986; Muller, Judd, & Yzerbyt, 2005).

AIM 3: Examining how victimization impacts macro-level outcomes was performed in four steps. Cluster analysis was used to identify natural, dichotomous groupings of neighborhoods as either high or low social disorganization. To ensure there were significant differences in census tract variables between the groups identified in cluster analyses, independent sample t-tests were performed. In addition, the effect size of the group differences on each census tract variable was estimated using Cohen's d. There were significant differences between the high and low social disorganization clusters on all census

tract variables except for percentage of the population age 65 and over, percentage of the population with some college but no degree, percentage of the population in sales or office occupations, and percentage of the population in production occupations. Where there were significant group differences, the effect sizes range from .205 to 2.388 (Table 4). A Cohen's d of 0.2 represents a small effect, 0.5 represents a medium effect, and anything over 0.8 represents a large effect size (Cohen, 1992b).

Next, the association between three levels of exposure (CM only, IPV/VAW only, and revictimization) and the outcome of living in areas of high social disorganization was examined through simple logistic regression. In the third step, cases who reported revictimization (both CM and IPV/VAW) were selected. Logistic regression was performed with race as the exposure and neighborhood disorganization as the outcome.

The final step was to examine the association between victimization and racial discordance with neighborhood using logistic regression. Racial discordance refers to an individual living in an area which is predominantly inhabited by individuals of a different race.

Discordance was calculated based on participant's race in relation to the racial composition of the neighborhood they live in. For instance, a Caucasian participant living in a predominantly African American neighborhood would be classified as discordant. Victimization (CM, IPV/VAW, or revictimization) was the exposure. Discordance with neighborhood was the outcome.

Prior to finalization of all regression models, model diagnostics were conducted and residuals were examined in order to identify outliers and influential data points. No such data points were identified.

1.5.4 Power

Power analyses were conducted using PASS software (Hintze, 2001). For logistic regressions in Aim1 (H1-H3); comparing likelihood of IPV/VAW between women with and without CM, the sample size of 477 allowed for adequate power (>80) to reliably detect an odds ratio of 2.04. In Aim 2; comparing likelihood of CM (H4) and IPV/VAW (H5) between Caucasian and African American women, the sample size of 477 allowed for adequate power (>80) to reliably detect

Table 3. Descriptive stats

Census tract variable	Cohen's d
% female headed households w/children	2.321
% population 15+ never married	1.654
% living in same house as in 1995	0.682
% unemployed	1.995
% HH w/ supplemental security income	2.290
% HH w/ social security income	0.288
% HH w/ public assistance	2.260
% population living below poverty level	2.703
% owner occupied housing units	1.791
% renter occupied housing units	1.167
% vacant housing units	1.715
% population age 65+	0.069
% population with high school education or less	1.203
% population w/some college; no degree	0.181
% population w/associate/bachelor degree	0.962
% population w/master's/doctorate/professional degree	0.725
% population in management/professional occupations	1.699
% population in service occupations	2.113
% population in sales/office occupations	0.247
% population in farming/fishing occupations	0.430
% population in construction occupations	0.995
% population in production occupations	0.159
Child/adult ratio	1.398
Male/female ratio	0.603
Alcohol sources	0.228

odds ratios of 1.69 (H4) and 2.10 (H5). For H6, the sample was restricted to women who reported childhood maltreatment (N=137). This provided adequate power (>80) to detect an odds ratio of 2.83 for revictimization when comparing African American and Caucasian women. When the sample was split by race (H7), the detectable odds ratio for African Americans (N=258) was 3.1. The detectable odds ratio for Caucasians (N=219) was 2.4. For H8, the full sample was analyzed. The detectable odds ratio was 2.04. The detectable odds ratios for CM, IPV/VAW, and revictimization in H9 were 1.89, 2.68, and 2.71, respectively. The sample was restricted to only those participants who reported revictimization (N=34) for H10. The detectable odds ratio was 7.95. For the final hypothesis (H11), the detectable odds ratio was 1.85.

In the analyses of the sample subset for which crime data are available the detectable odds ratios for CM, IPV/VAW, and revictimization in H9 (subsample) were 3.03, 5.37, and 6.04. The subsample was further restricted to revictimized women for H10 (subsample); which yielded a detectable odds ratio of 104.29. For the final hypothesis (H11subsample), the detectable odds ratio was 2.80.

While the detectable odds ratios are large for the hypotheses involving analyses of subsets of the study sample, these analyses are novel and may demonstrate promising directions for future studies employing larger samples of women with histories of victimization.

1.6 MANUSCRIPTS

Three peer-reviewed manuscripts were developed in the completion of this dissertation. They are as follows:

1. “Lifetime self-reported victimization among low-Income, urban women: the relations between childhood maltreatment and adult violent victimization.”
2. “African American, Caucasian differences in rates of women’s violent revictimization.”
3. “Race differences in neighborhood-level outcomes of women’s lifetime violent victimization.”

1.7 MANUSCRIPT HYPOTHESES

Manuscript 1. “Self-reported childhood maltreatment and subsequent adult violent victimization”

H1: Women with a history of more severe CM report more AVV.

H1a: Women with any CM report more AVV than women with no history of CM.

H1b: Women who experienced more than one form of CM (e.g. physical abuse, physical neglect, emotional abuse, emotion neglect, sexual abuse) report more AVV than those who experienced no CM or only one form of CM.

H2: The relation between CM and AVV is mediated by demographic, environmental, social, and psychological factors as well as substance use/abuse.

H2a: The relation between CM and AVV is mediated by demographic factors such as family income. For example, the relation between CM and AVV is different for women with lower household incomes compared to those with higher household incomes.

H2b: The relation between CM and AVV is mediated by social characteristics, like social support. For example, the relation between CM and AVV is different for women who have less social support than those with more social support.

H2c: The relation between CM and AVV is mediated by environmental factors such as living with a male in the household. The relation between CM and AVV will be different for women who live with a man than for those who do not live with a man.

H2d: The relation between CM and AVV is mediated by psychological factors including depression, anxiety, and substance use. The relation between CM and AVV is different for women who have depression, anxiety, or substance use, than for women with no depression, anxiety or substance use.

H3: The association between CM and AVV will remain significant after controlling for significant covariates.

Manuscript 2. “Race differences in self-reported childhood maltreatment, adult violent victimization, and adult revictimization”

H4: Caucasian women report CM with greater frequency than African American women.

H4a: Caucasian women report occurrence of any CM with higher frequency than African American women.

H5: African American women report AVV with greater frequency than Caucasian women.

H5a: African American women report occurrence of any AVV with higher frequency than Caucasian women.

H5b: African American women report higher number of incidents of AVV than Caucasian women.

H6: Among those with a history of CM, rates of revictimization is higher among African American women.

H6a: African American women with a history of CM report AVV more frequently than Caucasian women with a history of CM.

H7: The mediators in the CM-AVV relation differ by race.

H7a: The demographic, environmental, social, and psychological mediators in the relation between CM and AVV identified in Hypothesis 2 are different for African Americans and Caucasians.

H8: Sociodemographic factors moderate the CM-AVV relation

Manuscript 3. “Lifetime victimization as a predictor of characteristics of current area of residence”

H9: Revictimization is associated with living in areas of more social disorganization when compared to a history of CM only, or AVV only.

H10: Revictimization leads to a higher likelihood of living in an area of high social disorganization for Caucasian women compared to African American women.

H11: Revictimization (OR victimization; CM, AVV, both) leads to higher likelihood for living in a race discordant neighborhood for Caucasian women compared to African American women.

**2.0 MANUSCRIPT 1: LIFETIME SELF-REPORTED VICTIMIZATION AMONG
LOW-INCOME, URBAN WOMEN: THE RELATION BETWEEN CHILDHOOD
MALTREATMENT AND ADULT VIOLENT VICTIMIZATION**

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Manuscript in preparation

2.1 ABSTRACT

The aims of this study were twofold: 1) to examine the relations between multiple forms of CM and multiple forms of AVV, and 2) to explore mediating factors in the relations between CM and AVV in several domains, including social support, substance use, adult household size/structure, and psychological status. The data for these analyses were from two longitudinal studies in the Maternal Health Practices and Child Development project (MHCPD) on the effects of prenatal marijuana and alcohol exposure on child development. A standardized protocol measured maternal characteristics including psychological, social, and environmental factors, demographic status, and substance use. The woman's history of traumatic events, including adult violent victimization, was assessed at the 14-year assessment. History of childhood maltreatment was collected at the 16-year assessment. Childhood victimization was measured with the Childhood Trauma Questionnaire (CTQ); which assesses exposure to physical, sexual and emotional abuse, and physical and emotional neglect during childhood. The Trauma Assessment for Adults, Self-Report Version (TAA) was used to measure AVV. Three categories of victimization since age 19 were considered for these analyses: sexual assault, physical assault with a weapon, and physical assault without a weapon. In regression models, women with a history of CM were more than twice as likely to experience AVV as women with no history of CM. Additionally, an examination of whether there was a dose-response relation between CM and AVV found that those who experienced one or two forms of CM were significantly more likely to report any AVV compared to women with no CM. In mediation analyses, CM remained a significant predictor of AVV when controlling for variables bivariately associated with either the exposure

or outcome. Therefore, the relation between CM and AVV was only partially mediated by other factors. Baseline illicit drug use was the only significant mediator.

2.2 INTRODUCTION AND BACKGROUND

Violent victimization, including childhood abuse and neglect, and adult intimate partner violence, is common among women. Lifetime estimates of victimization for women are 17.6% for rape, 51.9% for physical assault, and 3% for stalking (Tjaden & Thoennes, 2000a). Women experience significantly more rapes and more frequent stalking than men, where the rates are 8% and 2%, respectively. Although they experience fewer physical assaults (51.9% of women versus 66.4% of men), women are more likely to be injured as a result of physical assaults. Further, women are more likely to experience repeated victimization. In the National Violence Against Women Survey, women who were raped in the previous 12 months averaged 2.9 rapes, while men averaged 1.2 rapes (Tjaden & Thoennes, 2000a).

In community samples, the estimated rate of childhood maltreatment (CM) ranges from 49 to 124 per 1000 children (Finkelhor et al., 2005; Straus, Hamby, Finkelhor, Moore, & Runyan, 1997). The most commonly self-reported forms of maltreatment are physical and sexual abuse. The co-occurrence of multiple forms of childhood maltreatment has been demonstrated (Bensley et al., 2000; Briere & Runtz, 1990; Dong, Anda et al., 2004). In the Adverse Childhood Experiences Study of adults from a health management organization (n=8,629), 67% of the sample had an adverse childhood experience (ACE), such as maltreatment, neglect, witnessing domestic violence, parental marital discord, or living with substance abusing, mentally ill, or criminal household members. Of those individuals who experienced an ACE, 86% reported

having experienced two or more ACEs, which included maltreatment, and 52% reported three or more ACEs (Bensley et al., 2000; Briere & Runtz, 1990; Dong, Anda et al., 2004). Similar findings have been reported in studies where the definition of childhood adversity was restricted to abuse and/or neglect (Edwards et al., 2003; Ney, Fung, & Wickett, 1994; Rorty, Yager, & Rossotto, 1994).

Individuals victimized as children are at increased risk for subsequent victimization during adulthood. The National Violence Against Women Survey (NVAWS) estimated the risk of specific (e.g. childhood sexual abuse followed by adult sexual assault) and non-specific (e.g. childhood sexual abuse followed by adult physical assault) revictimization (Tjaden & Thoennes, 2000a). After adjustment for age, race, ethnicity, education, employment, and marital status, women who were physically abused during childhood were 2.5 to 3 times more likely to experience adult physical and sexual victimization by an intimate partner than were women without such a history. Those women who experienced childhood sexual abuse were 2.3 times more likely to experience adult physical victimization and 1.1 times more likely to experience sexual victimization by an intimate partner (Tjaden & Thoennes, 2000a)

Subsequent analyses of NVAWS data also showed that women with a history of childhood victimization were at increased risk for victimization by individuals other than intimate partners. Women who experienced childhood sexual abuse were 1.3 and 3.0 times more likely to experience adult physical and sexual victimization, respectively, by a non-intimate partner. In addition, those who experienced childhood physical abuse were 2.7-3.0 times more likely to experience adult physical and sexual victimization by a non-intimate partner (Desai et al., 2002). Women who experienced both childhood physical and sexual abuse were between 1.9 and 4.8 times more likely to experience adult physical or sexual victimization. These relations,

however, applied only to CM and sexual revictimization. A similar relation was not observed for physical revictimization and it is not known whether there is a relation between exposure to other types of CM (e.g. neglect or emotional maltreatment) and subsequent exposure to multiple forms of adult violent victimization (AVV), including intimate partner violence (IPV) and other violence against women (VAW).

A history of CM is associated with psychosocial characteristics including substance use and psychiatric disorders like depression, anxiety, and post-traumatic stress disorder (National Research Council, 1993). In addition, adults with histories of CM often have problems in interpersonal relationships such as walking out on a partner, divorcing, being unfaithful to a romantic partner, or being revictimized (Colman & Widom, 2004; Gladstone et al., 2004; National Research Council, 1993). Significant correlates of IPV include poor social support, psychological distress, poverty, and substance use (Caetano & Cunradi, 2003; Caetano et al., 2000; Caetano, Field, Ramisetty-Mikler, & McGrath, 2005; Caetano, McGrath, Ramisetty-Mikler, & Field, 2005; Caetano, Schafer, & Cunradi, 2001; Centerwall, 1995; Wenzel et al., 2004). Two studies analyzed IPV risk factors for low income women and identified factors similar to those found in the general population, such as poor social support, psychological distress, or history of child maltreatment (Centerwall, 1995; Wenzel et al., 2004).

Understanding of the association between childhood and adult victimization is hindered by limitations in the literature. The first is a focus on specific forms of CM without considering or controlling for exposure to other forms. It is more informative to examine exposure to multiple forms simultaneously because, as noted above, forms of CM often co-occur. A second limitation is the use of non-standardized measures to assess CM and AVV, which leads to variations in the definitions and estimates of the rates of victimization (Lang et al., 2004). The

third limitation is a focus on intimate partner violence rather than the full range of violent victimization that women experience. A final limitation is a dearth of analytic models that incorporate mediating factors and use longitudinal data.

The aims of this study were twofold: 1) to examine the relations between multiple forms of CM and multiple forms of AVV, and 2) to explore mediating factors in the relations between CM and AVV in several domains, including social support, substance use, adult household size/structure, and psychological status. Three hypotheses were tested to address these aims: 1) women with a history of more forms of CM will have higher odds of reporting AVV; 2) the relation between CM and AVV will be partially mediated by social support, adult household characteristics, substance use, and psychological status; and 3) the association between CM and AVV will remain significant after controlling for mediators.

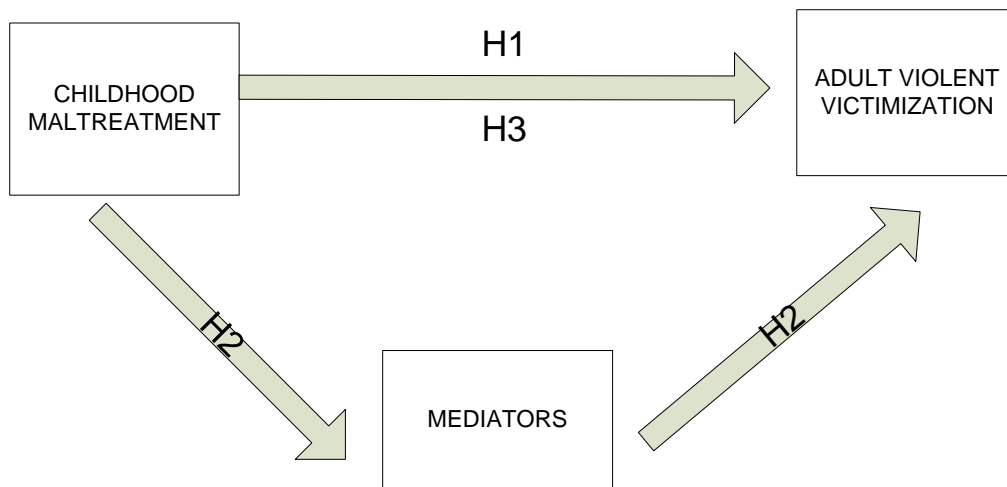


Figure 2. Conceptual model

2.3 METHODS

2.3.1 Participants, Design, Procedures

The data for these analyses were from two longitudinal studies in the Maternal Health Practices and Child Development project (MHCPD), which study the effects of prenatal marijuana and alcohol exposure on child development. Women 18 years and older (N=1,360) were recruited at their first prenatal visit to a hospital prenatal clinic. The initial refusal rate was 15%. Two cohorts were selected from this initial sample: (1) women who consumed three or more drinks per week in the first trimester and the next woman who drank less than that amount, and (2) women who reported smoking two or more joints per month during the first trimester and the next woman who smoked less than that amount. Identical instruments, methods, and personnel were used for both cohorts, which were combined for these analyses.

Subsequent assessments occurred in the second and third trimesters and at delivery. Seven hundred and sixty-three women with live, singleton births were followed-up at 8 and 18 months, and 3, 6, 10, 14, and 16 years postpartum. At each phase, a standardized protocol measured maternal characteristics including psychological, social, and environmental factors, demographic status, and substance use. The woman's history of traumatic events, including adult violent victimization, was assessed at the 14-year assessment. History of childhood maltreatment was collected at the 16-year assessment.

Maltreatment data were collected using a standardized measure that assessed five forms of maltreatment, physical, sexual & emotional abuse, and physical & emotional neglect. AVV was assessed using an instrument that provides data on a wide range of AVV including physical and sexual assault by intimate partners, other acquaintances, relatives, and strangers.

Data on covariates and potential mediators came from the first trimester, with the exception of social support, which was measured at the third trimester only. CM was based on events that occurred before age 18. At the first trimester all participants were age 18 and older, insuring that the reported CM occurred before potential mediators were measured. Data on AVV were assessed after age 19.

The sample for these analyses was restricted to women who attended the first and third trimester, and 14- and 16-year assessments. Retention rates for the MHPCD project have remained high across phases with 75% of the original cohort completing interviews at phases 14 and 16. After excluding non-biological caregivers from the 14-and 16-year phases and cases with missing data for CM or AVV, the final sample size for this study was 477 (Figure 3). There were no significant differences in demographic characteristics between the larger sample and those who were selected for these analyses.

2.3.2 Measures

Childhood victimization was measured with the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). The revised CTQ is a 25-item, self-report instrument that assesses exposure to physical, sexual and emotional abuse, and physical and emotional neglect during childhood. Respondents rate each item of the questionnaire on a Likert scale ranging from 1) Never True to 5) Very Often True. Suggested cut-points for determining cases of abuse/neglect were utilized (Bernstein & Fink, 1998a). Cronbach's alpha for the five maltreatment subscales range from .66 (physical neglect) to .92 (sexual abuse). Validity of the five subscales in adult samples was also demonstrated through confirmatory factor analysis (Bernstein & Fink, 1998a)

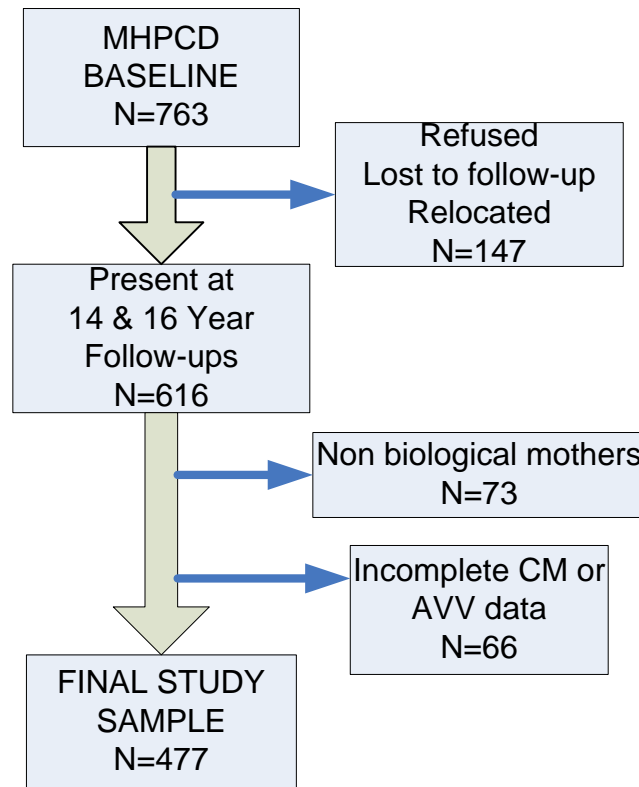


Figure 3. Sample size flow-chart

The Trauma Assessment for Adults, Self-Report Version (TAA; Resnick et al., 1993), was used to measure AVV. Three categories of victimization since age 19 were considered for these analyses: sexual assault, physical assault with a weapon, and physical assault without a weapon. Sexual assault history was based on responses to two questions: 1) has anyone ever used physical force or threat of force to make you have some type of unwanted sexual contact; and 2) has anyone ever used verbal or non-physical threats or pressure to make you have some type of unwanted sexual contact. Physical assault with a weapon was based on the question: has anyone, including family members or friends, ever attacked you with a gun, a knife, or some other weapon, regardless of whether you ever reported it? Physical assault without a weapon was ascertained by asking: has anyone, including family members and friends, ever attacked you

without a weapon, but with the intent to kill or seriously injure you? Age at first and last occurrence was asked for each event (Resnick et al., 1993).

Other measures included demographic characteristics, social support, substance use, depression and anxiety, and household size/structure. Depression was assessed using the Center for Epidemiologic Studies-Depression scale (CES-D; (Radloff, 1977)). The State Trait Anxiety Index was used to assess anxiety (Spielberger, Jacobs, Russell, & Crane, 1983). The social support assessment was based on a measure developed by Berkman and Syme (Berkman & Syme, 1979). Items included the total number of individuals relied upon for support as well as self-reported satisfaction with emotional and instrumental support/help received from relatives and friends. Household size and structure were reported by the women, indicating the number of individuals with whom the respondent lives and their relation to her (e.g. partner, children, parents, other adults).

Substance use measures were developed by the MHPCD Project (Day & Robles, 1989). Women were asked about their substance use at each phase. Average daily volume of alcohol consumed, average number of cigarettes smoked daily, average daily number of joints smoked, and any/no use of other illicit drugs (amphetamines, sleeping pills/tranquilizers, heroin, LSD/acid/mescaline, PCP, and angel dust) were assessed.

2.3.3 Data Analysis

The outcome variable, self-report of AVV, was dichotomized. The exposure, self-reported history of CM, was examined dichotomously and as a composite variable based on cut-points suggested for physical abuse, sexual abuse, physical neglect, emotional abuse, and emotional neglect (Bernstein & Fink, 1998a). Each variable was dichotomized between the

moderate and severe/extreme categories; thereby grouping those who scored in the severe or extreme range for each CM form as “1” and those whose scored in the ranges of moderate, low, minimal, or no maltreatment as “0” . The composite CM measure was created as a sum across the five dichotomous variables.

Binary (dichotomous exposure variable) and multinomial (composite exposure variable) logistic regressions were conducted. Examining both dichotomous and composite representations of CM and IPV/VAW allowed exploration of potential dose-response relationships. An advantage of multinomial regression on a composite variable is that it avoids the potential loss of statistical power resulting from dichotomization.

Mediation of the CM-AVV relation was tested using the Baron and Kenny method (Baron & Kenny, 1986). Once the association between the exposure and outcome was established, variables identified as potential mediators in the literature were entered into regression models with CM as the predictor and AVV as the outcome. Next, the relation of potential mediators to the outcome was tested with logistic regression of each variable on AVV. Significant variables identified in the above steps were entered as a block in a hierarchical (sequential) logistic regression to determine whether the significance and magnitude of the association between the exposure and outcome was modified after controlling for potential mediators.

2.4 RESULTS

The MHPCD sample selected for this study had slightly more African-American (54.1%) than Caucasian women. The mean monthly family income of the sample ranged from \$461 at baseline

to \$2,102 at the 16-year follow-up. At baseline, the majority of women were unemployed (72.7%) and unmarried (66.5%). At the 16-year follow-up, 25.8% were unemployed and 58.9% were unmarried (Table 4).

The prevalence of CM was 28.7% and the prevalence of AVV was 14.5% (Table 5). One hundred-three women (21.6%) reported CM only, without subsequent AVV. Adult victimization in absence of prior CM was reported by 35 women (7.3%). Thirty-four women (7.1 %) who reported both child and adult victimization were classified as revictimized.

The only demographic variable for which there was a significant difference in reported CM was race (Table 6). The group reporting CM was comprised of more Caucasians. Race was also the only demographic variable for which there were significant differences in AVV. More Caucasian than African American women reported AVV.

For the multinomial logistic regressions, women who experienced four and five forms of CM were collapsed into one group (4+). AVV was dichotomized for the binary logistic regressions. Women with a history of CM were more than twice as likely to experience AVV as women with no history of CM (OR, 2.88; 95% CI, 1.7-4.9; $p < .001$; regression Model 1, Table 7). To determine whether there were dose-response relations between CM and AVV, we examined whether the risk of AVV increased as the number of CM exposures increased. Those who experienced one form of CM (OR, 3.06; 95% CI, 1.5-6.3.0; $p < .001$) or two forms of CM (OR, 3.49; 95% CI, 1.6-7.4; $p < .005$) were significantly more likely to report any AVV compared to women with no CM (Model 2, Table 7).

2.4.1 Mediation of the relation between childhood maltreatment and adult violent victimization

We examined the independent relation of the predictor and outcome to potential mediators. CM was significantly related to baseline cigarette use; depression, and adult household composition (Table 8). In the second step of testing for mediation, other illicit drug use at baseline was associated with AVV.

Variables that were significantly associated with the exposure and/or outcome at $p < .10$ were entered into a logistic regression model (Table 9). When controlling for other variables, CM remained a significant predictor of AVV. Therefore, the relation between CM and AVV was only partially mediated by the variables considered in these analyses.

2.5 DISCUSSION

The current study demonstrates that low-income women who report a history of CM are at increased risk of AVV. Our measure of CM did not focus on only one specific type of maltreatment but included physical and emotional abuse and neglect as well as sexual abuse. Furthermore, the significance of the relation was demonstrated using a definition of AVV that included both intimate and non-intimate partner violence. The bivariate correlates of CM included baseline cigarette use, depression, and household composition. The only bivariate correlate of AVV was baseline illicit drug use. When these potential mediating variables were entered stepwise into a logistic regression model along with CM, baseline illicit drug use was a significant mediator of the relation between CM and AVV. CM remained a significant predictor

of AVV, however. Therefore, we concluded that there was only partial mediation: Women who experience CM and subsequently engage in illicit drug use are at increased risk for AVV. However, there is a direct relation between CM and AVV over and above that which is due to illicit drug use among CM victims.

The finding that exposure to any form of CM is associated with increased risk for any form of AVV, as measured by standardized instruments, is consistent with the results of numerous studies conducted in community (Fergusson, Horwood, & Lynskey, 1997; Schaaf & McCanne, 1998; Wyatt, Guthrie, & Notgrass, 1992), clinical (Briere & Runtz, 1987; Bryer, Nelson, Miller, & Krol, 1987; Cloitre, Tardiff, Marzuk, Leon, & Portera, 1996; Coid et al., 2001; West et al., 2000), and college populations (Filipas & Ullman, 2006; Gidycz, Coble, Latham, & Layman, 1993; Gidycz, Hanson, & Layman, 1995; Mayall & Gold, 1995; Messman-Moore & Long, 2000; Urquiza & Goodlin-Jones, 1994).

Many studies have focused on adult revictimization following childhood physical and/or sexual abuse only. In their examination of risk for intimate partner violence, Whitfield et al. (2003) considered sexual and physical CM as well as witnessing domestic violence; they similarly found an increased risk for IPV for those with a history of CM (Whitfield et al., 2003). The association between any CM and physical, sexual, or psychological victimization during adulthood, regardless of the relationship context, has also been demonstrated in previous studies (Cloitre et al., 1996; Coid et al., 2001; Desai et al., 2002; Kimerling, Alvarez, Pavao, Kaminski, & Baumrind, 2007; Schaaf & McCanne, 1998). We were able to find only one other study in which the relation between all five forms of CM and both violent and nonviolent adult victimization was examined, a cross-sectional study conducted in a small, Australian convenience sample (Irwin, 1999). They found significant associations between multiple forms

of both CM and AVV. However, the small sample size, sampling strategy, and lack of psychometric data on several of their measures of adult victimization limit the generalizability and comparability of their results (Irwin, 1999).

When CM exposure was used as a categorical predictor, exposure to two forms of CM was associated with highest risk for experiencing any AVV and for experiencing multiple forms of AVV. Surprisingly, the associations with AVV for those with a history of three more forms of CM were not as strong as those for two forms of CM. This is in contrast to a finding by Whitfield et al. (2003) that risk of victimization increased with the number of types of CM experienced (Whitfield et al., 2003). However, AVV in that study was limited to intimate partner violence and was assessed using a single screening question. In an attempt to explain the higher risk associated with exposure to two forms of maltreatment, we compared demographic characteristics and substance use between all exposure groups and found the only significant differences were in racial composition and cigarette use (results not shown). A larger proportion of the group that reported two forms of maltreatment was Caucasian compared to the overall sample (61.9% vs. 45.9%). Those women were also significantly heavier smokers at both the 14 and 16 year follow-up assessments. The raw scores on the CTQ subscales were no higher among women who reported two forms of maltreatment compared to other women in the sample. We also compared the types of CM (physical or emotional abuse/neglect or sexual abuse) experienced by those in each group. There was no clear pattern of certain forms or combinations of forms of CM associated with higher risk for AVV, in contrast to the findings of earlier studies in which combined sexual and physical abuse or physical abuse alone (Schaaf & McCanne, 1998) and physical and emotional abuse (Irwin, 1999) were associated with highest risk for adult

victimization, However, statistical power may have limited our ability to detect differences in these analyses.

There are other possible explanations for our findings. One is that women at higher levels of exposure to CM may be more likely than those with less exposure to use coping strategies like avoidance that decrease risk for victimization (Classen, Palesh, & Aggarwal, 2005). Another possibility is that women with highest levels of exposure to CM may be more likely to perpetrate violence or retaliate against aggressors (Whitfield et al., 2003).

There are several possible theoretical explanations for the observed relation between CM and AVV (Breitenbecher, 2001). Women with a history of CM may become more sensitive or aware of AVV or more willing to disclose AVV than women without such a history. These women may have problematic interpersonal relationships, which increase their likelihood of AVV (Colman & Widom, 2004). Cognitive attribution theories (e.g. learned helplessness) hypothesize that women with a history of CM are less likely to engage in self-protective behaviors due to prior experiences of having no control over negative experiences. Alternatively, diminished threat perceptions among these women may decrease the likelihood of self-protective behaviors. Most of these hypothesized explanations for revictimization, however, are limited to sexual revictimization (Arata, 2000; Breitenbecher, 2001; Irwin, 1999; Messman & Long, 1996). It is not known whether, and to what extent, these theories generalize to all forms of revictimization.

2.5.1 Limitations

The women in this study were selected from a prenatal clinic based on their use of alcohol and marijuana during the first trimester of pregnancy. Although the sample included

women who did not use alcohol or marijuana during pregnancy, a majority of the women were light to moderate users of either or both substances. In addition, the subjects represented a low-income population and were fairly homogeneous with regard to most demographic variables other than race. These factors limit the generalizability of these results to other populations.

An additional limitation is the retrospective nature of data on both CM and AVV. Women were asked at the 16-year follow-up, when their ages ranged from 34-60, to report on events that had occurred before age 18. AVV was assessed at the 14-year follow up, at which the respondents' ages ranged from 32-58 years. Therefore, women may have had to recall incidents that occurred up to fifty years earlier. This is a potential source of bias. However, both the CTQ and TAA instruments used in this study have previously been shown to be valid and reliable in collection of retrospective reports of victimization.

The temporal sequence in which data for this study were collected is a potential concern. Data on CM were collected at the most recent assessment, while the AVV data were obtained at the assessment prior to that. However, the CTQ has been shown to be reliable and valid in the assessment of CM in adult populations. Furthermore, the TAA, which was used to assess AVV, prompts participants to list the age at which each traumatic event occurred. Therefore, we believe that events reported as having occurred during adulthood were distinct from those reported to have occurred during childhood. It is possible that having been questioned at the 14-year assessment about lifetime traumatic events, including those that occurred during childhood, may have increased the women's recall of childhood events. However, an average of two years passed between assessment of AVV and CM and all women would have been affected equally, therefore any effect on the results would have been minimal.

Some of the confidence intervals surrounding our estimated odds ratios are large due to dichotomization of the exposure and outcome as well as the small cell sizes in the stratified analyses. Despite this limitation, we were able to demonstrate statistical significance of several important relations.

We set out to address limitations in the existing revictimization literature by examining both the relation between multiple forms of CM and multiple forms of AVV and factors mediating the relation between CM and revictimization during adulthood. There were several advantages to this study. One of the most important is that all forms of CM and AVV were considered. Further, data on all victimization were self-reported rather than obtained from official reports. The use of a racially balanced sample is an additional advantage. Standardized instruments were used for the assessments of victimization and key covariates like depression and anxiety, which will facilitate comparison of our results to other studies. Our analyses of the CM-AVV relation were also strengthened by the ability to control for covariates in eight domains that have been associated with victimization in prior studies.

2.5.2 Implications

Among low-income women, a history of CM exposure increased the risk of AVV. Our results suggest that the specific form, or combination of forms, of CM exposure (e.g. sexual abuse or physical abuse) may be less important than having had any CM exposure. This information can be used to target AVV prevention efforts specifically to adolescent and adult women who have a history of CM.

Table 4. Sample Characteristics

n=477	Baseline	14 year follow-up* n (%)	16 year follow-up
Race			
Black		258 (54.1)	
White		219 (45.9)	
Marital Status			
Single	317 (66.5)	243 (50.9)	281 (58.9)
Married	160 (33.5)	196 (41.1)	195 (40.9)
Work Status			
Unemployed	347 (72.7)	100 (21.0)	123 (25.8)
Employed	130 (27.3)	339 (71.1)	354 (74.2)
Monthly Income (\$)	461	1887	2102
Age (years)	23.0	38.3	40.3
Education (years)	11.8	12.5	12.2

* 38 participants (8.0%) refused responses on these items at this phase

Table 5. Prevalence of violent victimization

n=477	n	%
Childhood Maltreatment		
None	340	71.3
Any	137	28.7
1 form	50	10.5
2 forms	42	8.8
3 forms	21	4.4
4 forms	13	2.7
5 forms	8	1.7
Adult Violent Victimization		
None	403	85.5
Any	69	14.5
1 form	46	9.6
2 forms	18	3.8
≥3 forms	3	0.6
Lifetime Victimization		
None	305	63.9
Childhood only	103	21.6
Adult only	35	7.3
Both (revictimized)	34	7.1

Table 6. Baseline demographic characteristics by exposure and outcome

	%Black	%Single	%Employed	Mean Monthly Income	Mean Age	Mean Years Education
Childhood Maltreatment	p<.005	NS	NS	NS	NS	NS
None	60.3	67.1	70.6	460	23.1	11.9
Any	38.7	65.0	78.1	464	22.8	11.7
1 form	44.0	64.0	80.0	379	22.1	11.7
2 forms	38.1	73.8	78.6	546	24.4	11.7
3 forms	28.6	52.4	76.2	505	21.9	11.4
4 forms	30.8	69.2	84.6	484	22.5	11.8
5 forms	50.0	50.0	62.5	425	22.0	11.8
Adult Violent Victimization	p<.05	NS	NS	NS	NS	NS
None	56.6	66.9	72.5	452	23.1	11.8
Any	39.1	63.8	73.9	513	22.5	12.0
1 form	39.1	60.9	73.9	515	22.7	12.0
2 forms	33.3	72.2	77.8	483	21.8	11.7
≥3 forms	100.0	100.0	33.3	433	21.3	13.3
Lifetime Victimization	p<.005	NS	NS	NS	NS	NS
None	61.6	67.5	70.8	455	23.1	11.9
Childhood only	41.7	65.0	77.7	444	23.1	11.6
Adult only	48.6	62.9	68.6	503	23.2	12.3
Both (revictimized)	29.4	64.7	79.4	523	21.9	11.7

Table 7. History of childhood maltreatment predicting any adult violent victimization

Predictor	OR	95% CI
Model 1		
Any CM	2.88*	1.71, 4.85
Model 2		
No CM		reference
1 form	3.06*	1.49, 6.30
2 forms	3.49 [†]	1.64, 7.42
3 forms	2.05	0.64, 6.44
≥4 forms	2.05	0.64, 6.44

[†] Significant at p<.005

* Significant at p≤.001

Table 8. Results of bivariate analyses: identification of potential mediators

Covariates	Childhood Maltreatment p-value	Adult Violent Victimization p-value
Social support*		
No. friends/relatives relied upon for social support	NS	NS
Satisfaction with friends' support	NS	NS
Satisfaction with relatives' support	NS	NS
Baseline substance use*		
cigarettes	p<.05	NS
alcohol	NS	NS
marijuana	NS	NS
illicit drug use	NS	p<.05
Pre-baseline substance use [‡]		
alcohol	NS	NS
marijuana	NS	NS
Adult household structure*	p<.005	NS
Adult household size*	NS	NS
Psychological status*		
Depression	p<.005	NS
Anxiety	NS	NS
Hostility	NS	NS

* Measured at first trimester.

[‡] Retrospective report of year prior to pregnancy obtained at delivery

Table 9. Mediation model: Covariates predicting adult violent victimization over and above childhood maltreatment

Predictor	OR	95% CI	p-value
Logistic Regression Omnibus $\chi^2 = 23.164$; $p < .005$ Nagelkerke $R^2 = .084$			
Childhood maltreatment	2.803	1.638, 4.799	.000
Baseline depression			.436
Baseline smoking			.892
Baseline illicit drug use	2.838	1.307, 6.160	.008
Household composition			.846

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**3.0 MANUSCRIPT 2: RACE DIFFERENCES IN RATES OF WOMEN'S VIOLENT
REVICTIMIZATION**

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3.1 ABSTRACT

There were three aims of this study: 1) to determine whether the association between CM and AVV differed by race; 2) to examine whether mediators of the CM-AVV such as social support, substance use, adult household size/structure, and psychological status, differ by race; and 3) to determine whether sociodemographic variables (marital status, age, household income, employment status, educational attainment) moderate the CM-AVV relation within each race.

The data for these analyses were from two longitudinal studies in the Maternal Health Practices and Child Development project (MHCPD) of the effects of prenatal marijuana and alcohol exposure on child development. A standardized protocol measured maternal characteristics including psychological, social, and environmental factors, demographic status, and substance use. The woman's history of traumatic events, including adult violent victimization, was assessed at the 14-year assessment. History of childhood maltreatment was collected at the 16-year assessment. Childhood victimization was measured with the Childhood Trauma Questionnaire (CTQ); which assesses exposure to physical, sexual and emotional abuse, and physical and emotional neglect during childhood. The Trauma Assessment for Adults, Self-Report Version (TAA) was used to measure AVV. Three categories of victimization since age 19 were considered for these analyses: sexual assault, physical assault with a weapon, and physical assault without a weapon. The rate of revictimization among African American and Caucasian women who experienced childhood maltreatment was not significantly different. There were no significant mediators of the CM-AVV relation for African American women. Baseline marijuana use was a significant, partial mediator of this relation for Caucasian women.

3.2 INTRODUCTION

Revictimization occurs when an individual who has suffered childhood or adolescent abuse or neglect subsequently suffers one or more forms of violent victimization as an adult. The adult victimization (or revictimization) can occur at the hands of an intimate partner, a non-intimate acquaintance, or a stranger. Revictimization can be form-specific (e.g. adult sexual victimization following childhood sexual abuse) or non-specific (e.g. any adult victimization following any form of childhood maltreatment). In addition, revictimization can be an isolated or recurring event.

A history of childhood maltreatment (CM) is a risk factor for revictimization during adulthood (Coid et al., 2001; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Messman-Moore & Long, 2002; Schaaf & McCanne, 1998; Whitfield et al., 2003; Widom, 1997; Wyatt et al., 1992). One meta-analysis estimated that between 15% and 79% of female victims of childhood sexual abuse report adult sexual assault (Roodman & Clum, 2001). In the National Violence Against Women Survey (NVAWS, 2002), women who were physically abused during childhood were 2.8 times more likely to experience adult physical victimization and 2.6 times more likely to experience adult sexual victimization by an intimate partner after adjustment for age, race, ethnicity, education, employment status and marital status. Women who experienced childhood sexual abuse were 2.3 times more likely to experience physical victimization and 1.1 times more likely to experience adult sexual victimization by an intimate partner (Tjaden & Thoennes, 2000a)

A subsequent analysis of NVAWS data showed that women with a history of CM are also at risk for revictimization by individuals other than intimate partners. Women who experienced childhood sexual abuse were 1.3 times more likely to experience adult physical victimization and 3.0 times more likely to experience adult sexual victimization by a non-intimate partner. In addition, those who experienced childhood physical abuse were significantly more likely to experience adult physical and sexual victimization by a non-intimate partner, and women who experienced both childhood physical and sexual abuse were up to five times more likely to experience adult physical or sexual revictimization (Desai et al., 2002).

3.2.1 Racial differences in childhood maltreatment

Using self-report data from adults aged 18 and older, Scher et al., (2004) found that Caucasians were twice as likely as African Americans to report a history of childhood emotional abuse and neglect, while African Americans were 1.5 times more likely than Caucasians to report a history of childhood physical abuse (Scher et al., 2004). Adult retrospective reports of physical abuse were also higher among African Americans compared to Mexican Americans, Native Americans, and non-Hispanic Caucasians (Roosa et al., 1999). These racial differences may be due to sociodemographic risks (e.g. poverty) that are strongly associated with race (Sedlak & Broadhurst, 1996). However, observed racial differences were not completely eliminated after control for other demographic factors (Hussey, Chang, & Kotch, 2006).

3.2.2 Racial differences in adult violent victimization

In nationally representative studies, African Americans consistently report higher rates of partner abuse, and are 1.6-2.4 times more likely to report violence compared to Caucasians (Caetano et al., 2000; Coulton et al., 1999; Hampton & Gelles, 1994; Rennison & Welchans, 2000; Sorenson et al., 1996; Tjaden & Thoennes, 2000a; West, 2004). Gelles (1993) and Cunradi et al. (2002) found that the severity of intimate partner violence (IPV) differed by ethnicity (Cunradi et al., 2002; Gelles, 1993). African American and Hispanic couples were at 4-fold and 2-fold increased risks, respectively, for severe IPV compared to Caucasian couples (Cunradi et al., 2002; Gelles, 1993; Jasinski et al., 1997).

Race and ethnicity are the most consistent predictors of risk for any violence. The highest rates of violent victimization occur among African Americans and Latinos. African American females have significantly higher rates of non-stranger (e.g. family, friend, or acquaintance) violence than Latino and Caucasian women. African American and Latino women also experience significantly higher rates of stranger violence than Caucasian women (Lauritsen & White, 2001). Thus, generalizing risk factors associated with IPV across race/ethnic groups may not be appropriate (Field & Caetano, 2003). However, one study reported that after controlling for gender and socioeconomic status (estimated by annual household income), the victim's race was no longer a significant predictor of IPV (Rennison & Planty, 2003).

3.2.3 Racial differences in revictimization

The rates of sexual revictimization were highest among African American women (61.5%), followed by Caucasian women (44.2%) and Latinas (40%) (Urquiza & Goodlin-Jones,

1994). A recent cross-sectional study demonstrated that the magnitude of the effect of childhood physical abuse on risk for IPV and IPV risk factors differed between Caucasians, African Americans, and Hispanics (Schafer et al., 2004). Urquiza & Goodlin-Jones (1994) found that African American, Caucasian, and Latina women who had experienced child sexual abuse were more likely to be raped as adults than their counterparts without such a history, while Asian American women with a history of sexual abuse were not at increased risk for rape. In a study of 1,887 female Navy recruits, childhood sexual abuse predicted adult sexual victimization among Caucasians, African Americans, and Hispanics. Childhood physical abuse predicted adult sexual victimization only among African American women (Merrill et al., 1999).

3.2.4 Mediators of the childhood maltreatment and adult violent revictimization relation

There are few prospective studies of revictimization. Mediators of the relation between sexual abuse and sexual revictimization that have been identified include post-traumatic stress disorder, and alcohol/substance use (Arata, 2000; Caetano et al., 2001). Bender, Cook, and Kaslow (2003) found that social support mediated the relation between multiple forms of CM and adult IPV among African American women (Bender et al., 2003).

3.2.5 Summary of limitations in existing research

Previous studies of racial differences in revictimization were limited by several factors. The first is a focus on specific forms of revictimization without considering or controlling for exposure to other forms. Failure to account for all forms of victimization may result in the misattribution of risk associated with the forms selected for study. A second limitation is a focus

on intimate partner violence rather than the full range of violent victimization that women can experience. Failure to assess all such victimization could result in underestimation of the strength of the CM-AVV relation (Kaukinen, 2004; Tjaden & Thoennes, 2000a, 2000b). A third limitation is the use of non-standardized measures to assess CM and AVV, which leads to variations in the definitions and estimates of victimization (Lang et al., 2004). A fourth limitation is a failure to examine the relation of race and/or ethnicity to revictimization. A final limitation is the paucity of longitudinal studies and analytic models that incorporate mediation analyses of the CM-AVV relation.

3.2.6 Objectives of current study

There were three aims of this study: 1) to determine whether the association between CM and AVV differed by race; 2) to examine whether mediators of the CM-AVV such as social support, substance use, adult household size/structure, and psychological status, differ by race; and 3) to determine whether sociodemographic variables (marital status, age, household income, employment status, educational attainment) moderate the CM-AVV relation within each race.

We hypothesized that: 1) Caucasian women will report CM with greater frequency than African American women; 2) African American women will report AVV with greater frequency than Caucasian women; 3) Among women with a history of CM, rates of revictimization will be higher among African American women; 4) The mediators in the CM-AVV relation will differ by race; and 5) For each race, demographic factors will moderate the effects of mediators in the CM- AVV relation.

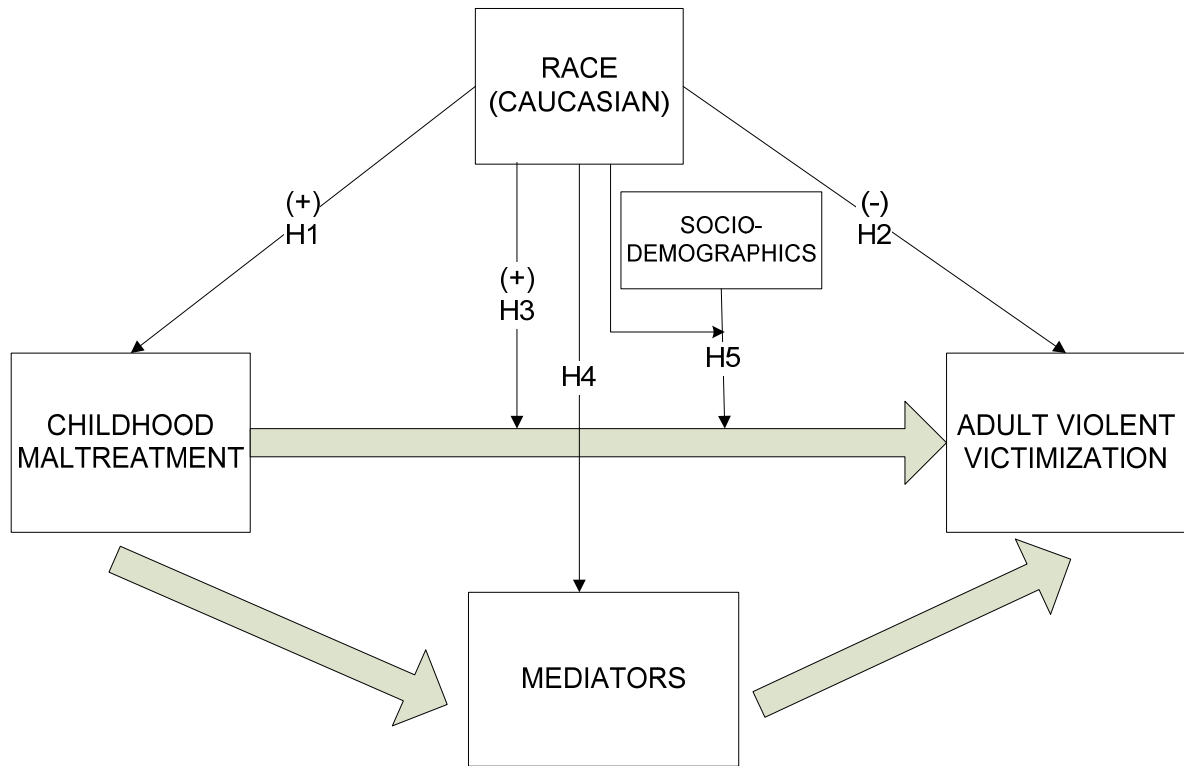


Figure 4. Manuscript 2 Conceptual Model

3.3 METHODS

3.3.1 Participants, Design, Procedures

The data for these analyses are from two studies within the Maternal Health Practices and Child Development project (MHCPD). These are longitudinal studies of the effects of prenatal marijuana and alcohol exposure on child development. Women 18 years and older (N=1,360) were recruited at their fourth month prenatal visit to a hospital prenatal clinic. The initial refusal rate was 15%. From this sample, two cohorts were selected: (1) women who consumed three or more drinks per week in the first trimester and the next woman who drank less than that amount, and (2) women who reported smoking two or more joints per month during the first trimester and the next woman who smoked less than that amount. Identical instruments, methods, and personnel were used for both cohorts, which were combined for these analyses.

Subsequent assessments occurred in the second and third trimesters and at delivery. Seven hundred and sixty-three women with live, singleton births were followed at 8 and 18 months, and 3, 6, 10, 14, 16, and 22 years postpartum. At each phase, a standardized protocol measured maternal characteristics including psychological, social, and environmental factors, demographic status, and substance use. Each woman's history of traumatic events, including adult violent victimization, was assessed at the 14- and 16-year assessments. The woman's history of childhood maltreatment was collected at the 16-year assessment.

For this analysis, data on potential mediators came from the first trimester assessment (baseline), with the exception of social support, which was measured at the third trimester only. CM was based on self-report of events that occurred before age 18. At the baseline, all

participants were age 18 and older, insuring that the reported CM occurred before potential mediators were measured. AVV which occurred after age 19 was assessed.

The sample for these analyses was restricted to women who attended the baseline, third trimester, and 14- and 16-year assessments (n=616). Retention rates for the MHPCD project have remained high across phases with 75% of the original cohort completing interviews at the 14- and 16- year follow-ups (Table 10). After the exclusion of non-biological caregivers from the 14-and 16-year phases and cases with missing data for CM or AVV, the final sample size for these analyses was 477. The selected sample did not differ from the total sample in terms of demographics or substance use at baseline.

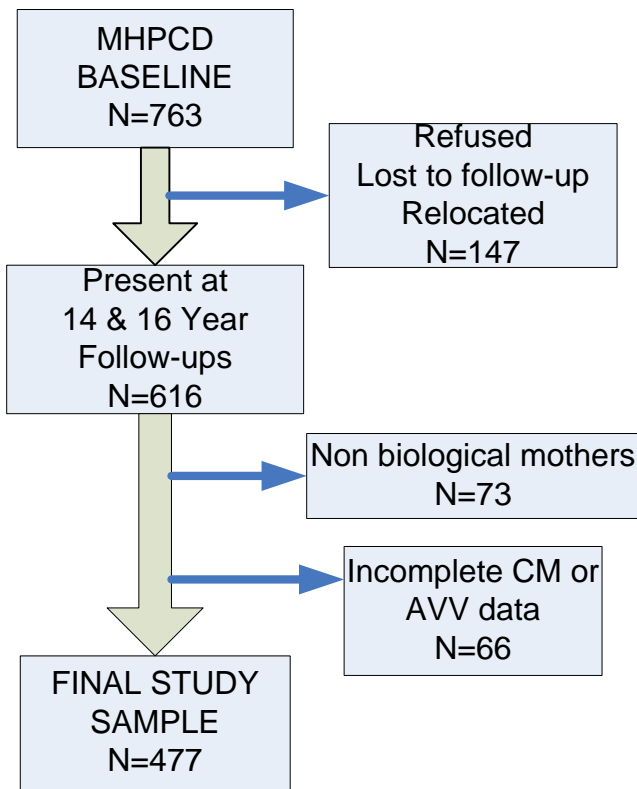


Figure 5. Sample size flow-chart

3.3.2 Measures

Childhood victimization was measured with the Childhood Trauma Questionnaire (CTQ; (Bernstein & Fink, 1998a)), a 25-item, self-report instrument that assesses exposure to physical, sexual, and emotional abuse, and physical and emotional neglect during childhood. Respondents rate each item on a Likert scale ranging from 1) Never True to 5) Very Often True. Suggested cut-points for determining cases of abuse/neglect were utilized (Bernstein & Fink, 1998a). Cronbach's alpha for the five maltreatment subscales range from .66 (physical neglect) to .92 (sexual abuse); indicating good reliability (Bernstein & Fink, 1998a). Validity of the five subscales in an adult sample was also indicated through confirmatory factor analyses (Bernstein & Fink, 1998a).

Adult violent victimization was measured with the Trauma Assessment for Adults, Self-Report Version (TAA; (Resnick et al., 1993)). Three categories of victimization were considered: sexual assault, physical assault with a weapon, and physical assault without a weapon. Ages at first and last occurrence were asked for each event (Resnick et al., 1993).

Variables identified as potential mediators in the literature on CM and/or AVV included demographic characteristics, social support, substance use, depression and anxiety, and household size/structure. Depression was assessed using the Center for Epidemiologic Studies-Depression scale (CES-D; (Radloff, 1977)). The State-Trait Personality Index was used to assess anxiety (Spielberger, Jacobs, Crane et al., 1983). Social support was based on a measure developed by Berkman & Syme (Berkman & Syme, 1979). Items included the total number of individuals relied upon for support as well as satisfaction with emotional and instrumental support/help received from relatives and friends. Household size and structure, the number of

individuals with whom the respondent lived and their relation to her, were reported by the women.

Substance use measures were developed by the MHPCD Project (Day & Robles, 1989)). Women were asked about their substance use at each phase. The quantity, frequency, and pattern of use were assessed and the following variables were created to represent substance use: Average daily volume of alcohol consumed, usual number of cigarettes smoked daily, average daily number of joints smoked, and any/none use of other illicit drugs including amphetamines, sleeping pills/tranquilizers, heroin, LSD/acid/mescaline, PCP, and angel dust.

3.3.3 Data Analyses

Analyses were conducted separately for Caucasians and African Americans. AVV was dichotomized (any/none). Each CM subscale was dichotomized (0,1) using the cut-point between the moderate and severe-extreme categories as defined by the authors (Bernstein & Fink, 1998a). Scores on the five dichotomous subscales were summed to create a composite CM measure which ranged from 0-5.

Binary (dichotomous exposure variable) and multinomial (composite exposure variable) logistic regressions were conducted. Examining both dichotomous and ordinal representations of CM allowed exploration of potential dose-response relationships.

Mediation of the CM-AVV relation was tested using the Baron and Kenny method (Baron & Kenny, 1986). In the first step CM was regressed on potential mediators in separate regression models. Next, each potential mediator was regressed on AVV. Significant variables ($p < .10$) identified in the above steps were entered as a block in stepwise logistic regression to determine whether the significance and magnitude of the association between the exposure and

outcome was modified after controlling for potential mediators (e.g. whether there was mediation). Regressions of the interactions between race and each potential mediator on AVV were conducted to directly test the statistical significance of race differences in mediators.

Moderation, which was hypothesized to be between mediators and demographic variables (e.g. illicit drug use*income), was tested by examining whether the significance of mediators in the CM-AVV relation differed depending on the level of a given demographic variable (age, income, employment, marital status, education). Tests for moderation were performed separately for each mediator-demographic variable pair (5 demographic variables x 15 mediators = 75 moderation effects tested). First, the mediator, the demographic variable, and the interaction term (mediator*demographic) were regressed on AVV. Next, any interaction terms that were significant were entered, along with their main effects, into hierarchical logistic regression models predicting AVV.

3.4 RESULTS

There were slightly more African American (54.1%) than Caucasian women in the sample included in these analyses. The mean monthly household income of the women ranged from \$461 at baseline (from 1982 to 1985) to \$2,102 at the 16-year follow-up (from 2000-2003). At delivery, the majority of women were unemployed (73%) and unmarried (67%). At the 16-year follow-up, 25.8% were unemployed and 58.9% were unmarried (Table 10).

The prevalence of CM was significantly higher in Caucasian women (38.4%) than in African American women (20.5%) (Table 11). Caucasian women also reported a significantly higher prevalence of AVV than African American Women (19.2% vs.10.5%). Fewer African

American women (16.7%) than Caucasian women (27.4%) reported CM without subsequent AVV. Adult victimization only was reported by 6.6% of African American and 8.2% of Caucasian women. Revictimization was reported by 3.9% of the African American and 11.0% of the Caucasian women.

In bivariate analyses, the rates of revictimization among women who experienced childhood maltreatment did not differ statistically between African Americans and Caucasians (Table 12). In the logistic regression, African American women with a history of CM were more than two times as likely to report AVV as African American women with no history of CM (OR, 2.57; 95% CI, 1.1-6.0; $p < .05$; regression Model 1, Table 13). A history of childhood maltreatment was associated with a 2.6-fold increase in the likelihood of AVV among Caucasian women (OR, 2.60; 95% CI, 1.3-5.2; $p < .05$).

To assess whether there were dose-response relations between CM and AVV, we examined whether the risk of AVV increased as the number of CM exposures increased. Only the regression model for Caucasian women was statistically significant. Among Caucasian women, there was not a pattern of increasing AVV risk with increasing number of CM exposures. The only significant category of exposure, experiencing two forms of CM (OR, 4.06; 95% CI, 1.6- 10.3; $p < .05$), was associated with a significantly higher likelihood of reporting AVV (Model 2, Table 13) compared to those that experienced more forms of CM, and those that experienced fewer forms of CM.

3.4.1 Race differences in mediation of relation between childhood maltreatment and adult violent victimization

In the direct tests of race differences in the relation of potential mediators to AVV, the only significant interaction effect was for baseline marijuana use (Table 14). Next, race stratified tests of mediation were conducted. Among African American women, CM was significantly related to baseline and pre-baseline marijuana use, baseline symptoms of depression, anxiety, and hostility, household composition at baseline (e.g. living with others vs. living alone) (Table 15). Among Caucasian women, baseline depression was significantly associated with CM. Baseline marijuana and illicit drug use were the only variables associated with AVV.

Variables that were significantly associated with the exposure and/or outcome at $p < .10$ were entered into race-specific logistic regression models (Table 16). Anxiety was not included in the regression model for African American women because of its high correlation with depression. In the final logistic regression model for African American women, those with a history of CM were almost two and a half times as likely to report subsequent AVV than those with no CM history (OR: 2.45, 95%CI: .99, 6.1). There were no significant mediators of this relation.

In the final, logistic regression model for Caucasian women, those with a history of CM were more than two and a half times as likely to report subsequent AVV than those with no CM history (OR: 2.64, 95%CI: 1.3,5.4). Baseline marijuana use was a significant, partial mediator of this relation (OR: 1.72, 95%CI: 1.0, 2.5).

3.4.2 Race differences in moderation of relation between childhood maltreatment and adult violent victimization

Among African American women, there were no significant interaction effects between covariates and demographic moderators (Table 17). For Caucasian women, women's age moderated the relation of baseline alcohol use and pre-baseline alcohol use to AVV. As age increased, women with higher levels of alcohol use were more likely to experience AVV. These significant moderation effects were entered stepwise along with any significant mediators into the race-specific regression of CM predicting AVV (Table 9).

When moderation effects (baseline alcohol use x age and pre-baseline alcohol use x age) were included in the regression model for Caucasian women, CM remained a significant predictor of AVV. In the stepwise-regression, CM (OR: 2.6, 95%CI: 1.2, 5.5) and age (OR: 0.87, 95%CI: .77, .98) entered the model as the only significant predictors of AVV (Table 18).

3.5 DISCUSSION

The aims of this study were to examine racial differences in the association between CM and AVV, and to identify mediators of that association and variables that moderated the impact of those mediators. The first hypothesis, that the prevalence of CM would be higher among Caucasian women in this sample, was confirmed; the rate of CM among Caucasian women was almost 20% higher than that for African American women. This is in contrast to reports of CM rates by race in the literature where African Americans often have been found to have the highest rates (U.S. Department of Health and Human Services, 2005). Our findings may be due to the

restricted range of socioeconomic status for both racial groups in our low-income sample. The use of self-report data rather than data obtained from official reports, which tend to represent the most extreme cases and overrepresent minority groups (Scher et al., 2004; Wyatt & Peters, 1986), may also explain the differences between our findings and those of other studies.

The second hypothesis, that African American women would report higher rates of AVV than Caucasian women, was not supported. The converse was true; Caucasian women reported almost twice as much AVV than African American women. This finding is also in contrast to the literature. African American race has been one of the most consistent predictors of risk for any violent victimization, even after controlling for socioeconomic status (Caetano et al., 2000; Cunradi et al., 2002; Field & Caetano, 2005; Gelles, 1993; Jasinski et al., 1997). The majority of violence that women experience occurs within the context of intimate relationships (Kaukinen, 2004; Tjaden & Thoennes, 2000a, 2000b). Furthermore, lower socioeconomic status is associated with AVV (Tjaden & Thoennes, 2000b; Vogel & Marshall, 2001). Therefore, the fact that the Caucasian women in our study were significantly more likely to be married and to have significantly fewer years of education than African American women may account for this finding.

The third hypothesis, that the association between CM and AVV would be greater for African American women, was not supported by our data. A history of CM increased the odds for AVV among both races by over two and a half times. To our knowledge, there are no other studies which have utilized similar definitions of CM and AVV and made comparisons by using similar statistical methods. Higher rates of sexual revictimization among African American women, relative to Caucasian women, have been found in other studies, one of which was a survey of 1,887 female Navy recruits and the other conducted in a multiethnic random sample of

243 female community college volunteers (Merrill et al., 1999; Urquiza & Goodlin-Jones, 1994). The magnitude of our estimates of association are comparable to those of a previous study of the association between multiple forms of CM and AVV among all women (Desai et al., 2002).

When we examined the dose-response relation between CM and AVV, there were significant race differences. Among African Americans, only exposure to one form of CM significantly predicted AVV. This may have been due to lower statistical power in the African American sub-sample. Among Caucasian women, exposure to one form of CM was borderline significant ($p=.051$; value not shown). Exposure to two forms of CM was associated with more than a four-fold increase in the likelihood of reporting AVV. However, exposure to three or more forms did not significantly predict AVV. This effect may have also been due to the limited statistical power of our stratified analyses.

In post-hoc analyses (results not shown), we conducted race-stratified comparisons of demographic characteristics and substance use between women who reported two forms of CM and other CM exposed women. There were no differences for African American women. Among the Caucasian women, those in the two-CM exposure group reported heavier baseline alcohol use and were also significantly heavier cigarette and marijuana smokers at the 16-year follow-up assessment. We also examined the raw scores on the CTQ subscales for women who reported two forms of maltreatment compared to other women in the sample. There were no differences in any CTQ subscale raw scores for either race. We also compared the types of CM (physical or emotional abuse/neglect or sexual abuse) experienced by those in each group. We found no clear pattern of certain forms or combinations of forms of CM associated with higher risk for AVV

Our fourth hypothesis was that the mediators in the CM-AVV relation would differ by race. Fifteen different variables in six domains were tested as potential mediators of the CM-

AVV for African Americans and Caucasians. There was no significant mediation of the relation for African Americans. These results contrast with those reported by Bender et al (2003), in which social support was found to mediate the relation between all five forms of CM and subsequent revictimization (Bender et al., 2003). Their sample consisted of low-income African American women; half of whom were recruited from a hospital following a suicide attempt. A quarter of that sample also reported a history of inpatient psychiatric or substance abuse treatment. The psychological profile of the Bender et al. study population may have led to an overestimation of the importance of social support in the CM-AVV relation. By contrast, we found that among Caucasian women, women who reported illicit drug use at baseline were 1.79 times more likely to report AVV than those who did not use illicit drugs. Even after we controlled for illicit drug use, CM remained a significant predictor of AVV among Caucasian women.

The final hypothesis tested moderation of the CM-AVV relation by demographic variables. There was no significant moderation among either African Americans or Caucasians. Baseline demographic variables did not influence the relation of CM or AVV. Sample homogeneity with regard to most of the demographic variables may have limited our ability to detect moderation. The only demographic variable which has previously been reported to moderate the CM-AVV relation is marital status (Classen et al., 2005). Income is commonly found to moderate the relation between race and victimization (Coker, Smith, McKeown, & King, 2000; Straus & Gelles, 1990b; Tjaden & Thoennes, 2000a). However, our low income sample had modest variation in baseline household income. The limited variability along with stratification by race, which is highly correlated with income, may explain our failure to replicate the finding of income as a moderator.

The observed racial differences in the CM-AVV relation may be related to cultural differences in parenting practices. Studies have indicated that ethnic minorities are more accepting of physically and emotionally punitive measures in child rearing (Ferrari, 2002; Straus & Gelles, 1990b). Therefore, the threshold for perceived or self-reported maltreatment could be higher for African Americans compared to Caucasians. Another possibility is that African American women may have experienced more severe abuse/neglect than Caucasian women reporting similar experiences. This could explain the consistently higher odds of AVV associated with CM for African American women. Further research is needed to explore this hypothesis.

3.5.1 Limitations

The women in this study were selected from a prenatal clinic based on their use of alcohol and marijuana during their first trimester of pregnancy. Although the sample included women who did not use alcohol or marijuana during pregnancy, a majority of the women were light to moderate users of either or both substances. In addition, the subjects represented a low-income population and are fairly homogeneous with regard to most demographic variables other than race. These factors limit the generalizeability of these results to other populations and may have constrained our ability to assess the impact of demographic moderators and mediators on the relation between CM and AVV.

An additional limitation is the retrospective nature of data on both CM and AVV. Women were asked at the 16-year follow-up, when respondent ages ranged from 34-58, to report on events that had occurred before age 18. AVV was assessed at the 14-year follow up, at which the respondents' ages ranged from 32-57 years. Therefore, women may have had to recall incidents that occurred up to fifty years earlier. This is a potential source of bias. However, both

the CTQ and TAA instruments used in this study have previously been shown to be valid and reliable in collection of retrospective reports of victimization.

The temporal sequence in which data for this study were collected is a potential concern. Data on CM were collected at the most recent assessment and AVV data were obtained at the assessment two years prior to that. However, the CTQ has been shown to be reliable and valid in the assessment of CM in adult populations. Furthermore, the TAA, which was used to assess AVV, prompts participants to separately identify traumatic events that occurred before and after age 18. Therefore, we are comfortable in our assumption that events reported as having occurred during adulthood were distinct from those reported to have occurred during childhood. It is possible that having been questioned about lifetime traumatic events, including those that occurred during childhood, at the 14-year assessment may have increased the women's recall of childhood events. However, an average of two years passed between assessment of AVV and CM, and all women would have been equally affected by any recall issues. For this reason we believe that any effect on the results would have been minimal.

Some of the confidence intervals surrounding our estimated odds ratios are large due to the small cell sizes in stratified analyses. Despite this limitation, we were able to demonstrate the statistical significance of several important relations.

3.5.2 Strengths

There were several advantages to this study. One of the most important strengths is that all forms of CM and AVV were considered. Furthermore, data on all victimization was self-reported rather than obtained from official reports, which can introduce bias (National Research Council, 1993; Scher et al., 2004; Wyatt & Peters, 1986). Use of a racially balanced sample is an

advantage of these analyses. Standardized instruments were used for the assessment of victimization and key covariates such as depression and anxiety which will facilitate comparison of our results to other studies in which similar instruments have been used. Our analyses of the CM-AVV relation were also strengthened by the examination of effects of sociodemographic variables and the ability to control for covariates in eight domains, which have been associated with victimization in prior studies.

3.5.3 Conclusions

We addressed limitations in the existing revictimization literature by examining racial differences in the association between multiple forms of CM and multiple forms of AVV, and factors mediating the relation between CM and revictimization during adulthood. We concluded that a history of any childhood maltreatment is associated with increased odds of experiencing AVV for both African Americans and Caucasians. Though not statistically different, the odds of revictimization were higher for African Americans. There was no evidence of a dose-response between number of forms of CM experienced and likelihood of AVV. There were also racial differences in mediation of the CM-AVV relation; baseline marijuana use mediated the relation for Caucasian women. There were no mediators of the CM-AVV relation among African Americans. There was no moderation of the effect of mediators on the CM-AVV relation in either race.

3.5.4 Implications

As reported in our previous research (Parks, Kim, Day, Garza, & Larkby, 2008), a history of CM exposure increases the risk of AVV among low-income women. Our results suggest that exposure to any CM, regardless of the form or combination of forms increases women's risk of experiencing AVV in adulthood. Both Caucasian and African American women continue to be vulnerable to interpersonal violent victimization as a long-term effect of CM.

The results of the present study demonstrate that there are racial differences in the association between CM and AVV. Specifically, there appear to be mediating factors present for Caucasian women while not for African American women. Marijuana use during pregnancy also appears to be an important mediating factor among Caucasian women. Caucasian women with a history of CM are at increased risk for experiencing AVV. In addition, those Caucasian women who use marijuana during pregnancy are at risk of experiencing AVV independent of the risk associated with their CM history. This information can be used to target prevention efforts to the CM exposure women who are at highest risk for subsequent adult victimization.

Table 10. Sample characteristics

n=477	Delivery	14 year follow-up* n (%)	16 year follow-up
Race			
Black		258 (54.1)	
White		219 (45.9)	
Marital Status			
Single	317 (66.5)	243 (50.9)	281 (58.9)
Married	160 (33.5)	196 (41.1)	195 (40.9)
Work Status			
Unemployed	347 (72.7)	100 (21.0)	123 (25.8)
Employed	130 (27.3)	339 (71.1)	354 (74.2)
Monthly Income (\$)	461	1887	2102
Age (years)	23.0	38.3	40.3
Education (years)	11.8	12.5	12.2

* 38 participants (8.0%) refused responses on these items at this phase

Table 11. Prevalence of violent victimization by race

n=477	African American n (%)	Caucasian n (%)	χ^2	p-value
Childhood Maltreatment				
None	205 (79.5)	135 (61.6)	20.060	=.001
Any	53 (20.5)	84 (38.4)		
1 form	22 (8.6)	28 (12.9)		
2 forms	16 (6.2)	26 (12.0)		
3 forms	6 (2.3)	15 (6.9)		
4 forms	4 (1.6)	9 (4.1)		
5 forms	4 (1.6)	4 (1.8)		
Adult Violent Victimization				
None	231 (89.5)	177 (80.8)	10.863	<.05
Any	27 (10.5)	42 (19.2)		
1 form	18 (7.0)	28 (12.9)		
2 forms	6 (2.3)	12 (5.5)		
≥3 forms	3 (1.2)	0 (0.0)		
Lifetime Victimization				
None	188 (72.9)	117 (53.4)	22.086	<.001
Childhood only	43 (16.7)	60 (27.4)		
Adult only	17 (6.6)	18 (8.2)		
Both (revictimized)	10 (3.9)	24 (11.0)		

Table 12. Prevalence of revictimization by race among those with history of childhood maltreatment

n=477	No AVV	AVV	χ^2	p-value
	n (%)	n (%)		
African American	43 (81.1)	10 (18.9)	.228	.140
Caucasian	60 (71.4)	24 (28.6)		

Table 13. History of childhood maltreatment predicting any adult violent victimization

Predictor	African American	Caucasian
	n=258	n=219
	OR (95%CI)	OR (95% CI)
Model 1	Model $\chi^2=4.416$ p=.036	Model $\chi^2=7.561$ p=.006
Any CM	2.57 (1.1, 6.0)	2.60 (1.3, 5.2)
Model 2	Model $\chi^2=4.131$ p=.389	Model $\chi^2=10.007$ p=.040
No CM	reference	reference
1 form	3.25* (1.1, 9.9)	2.60 (1.0, 6.8)
2 forms	1.58 (0.3, 7.5)	4.06 [†] (1.6, 10.3)
3 forms	2.21 (0.2, 20.0)	1.63 (0.4, 6.3)
4≥ forms	1.58 (0.2, 13.6)	1.95 (0.5, 7.8)

*Significant at p<.05

[†] Significant at p<.005

Table 14. Test for race differences in mediators of the CM-AVV relation

Variable tested (var x race)	p-value
CTQ	.365
Social support	
No. friends/relatives relied upon for social support	.997
Satisfaction with friends' support	.737
Satisfaction with relatives' support	.737
Baseline substance use	
cigarettes	.473
alcohol	.231
marijuana	.047
illicit drug use	.712
Pre-baseline substance use	
alcohol	.216
marijuana	.811
Adult household structure	.165
Adult household size	.077
Psychological status	
Depression	.278
Anxiety	.624
Hostility	.896

Table 15. Results of bivariate analyses for potential mediators

	CM African American (n=258)	AVV	CM	AVV
Covariates	p-value		Caucasian (n=219) p-value	
Social support				
No. friends/relatives relied upon for social support	NS	NS	NS	NS
Satisfaction with friends' support	NS	NS	NS	NS
Satisfaction with relatives' support	NS	NS	NS	NS
Baseline substance use				
cigarettes	NS	NS	NS	NS
alcohol	NS	NS	NS	NS
marijuana	p<.10	NS	NS	p<.10
illicit drug use	NS	NS	NS	p<.10
Pre-baseline substance use				
alcohol	NS	NS	NS	NS
marijuana	p<.10	NS	NS	NS
Adult household structure	p<.005	NS	NS	NS
Adult household size	NS	NS	NS	NS
Psychological status				
Depression	p<.05	NS	p<.05	NS
Anxiety	p<.10	NS	NS	NS
Hostility	p<.10	NS	NS	NS

Table 16. Adjusted logistic regression models: Childhood maltreatment and covariates predicting adult violent victimization

AFRICAN AMERICAN (n=258) Predictor	OR	95% CI	p-value
Model 1-Logistic Regression			
Omnibus $\chi^2(7) = 8.919$; $p = .259$			
Nagelkerke $R^2 = .070$			
Childhood maltreatment	2.454	0.994, 6.060	.052
Baseline depression			.344
Hostility			.863
Household structure			.319
Pre-baseline marijuana use			.420
Baseline marijuana use			.443
CAUCASIAN (n=219) Predictor	OR	95% CI	p-value
Model 1-Logistic Regression			
Omnibus $\chi^2(4) = 16.844$; $p = .002$			
Nagelkerke $R^2 = .119$			
Childhood maltreatment	2.637	1.291, 5.386	.008
Baseline depression			.805
Baseline marijuana use	1.718	1.0, 2.5	.032
Baseline illicit drug use			.271

Table 17. Stratified tests for moderation by demographic variables

AFRICAN AMERICAN (n=258)	OR	95% CI	p-value
Predictor			
Friend support x education			.091
Anxiety x education			.064
Pre-baseline alcohol x education			.070
Household size* age			.072
Size of social support network x income			.054
CAUCASIAN (n=219)			
Predictor			
Hostility x employment			.092
Hostility x education			.091
Pre-baseline marijuana use x marital status			.079
Household composition x employment status			.097
Alcohol use x age	1.155	1.05, 1.27	.005
Alcohol use			.10
Age			.001
Anxiety x age			.064
Pre-baseline alcohol x age	1.055	1.01, 1.11	.025
Pre-baseline alcohol			.038
Age			.003

Table 18. Full regression models by race including all bivariate significant covariates and interaction terms

AFRICAN AMERICAN (n=258) Predictor	OR	95% CI	p-value
Model 1-Logistic Regression			
Omnibus $\chi^2(7) = 8.919$; $p = .259$			
Nagelkerke $R^2 = .070$			
Childhood maltreatment	2.454	0.994, 6.060	.052
Baseline depression			.344
Hostility			.863
Household structure			.319
Pre-baseline marijuana use			.420
Baseline marijuana use			.443
CAUCASIAN (n=219) Predictor	OR	95% CI	p-value
Model 1-Logistic Regression			
Omnibus $X^2(9) = 29.379$, $p = .001$			
Nagelkerke $R^2 = .202$			
Childhood maltreatment	2.611	1.239, 5.500	.012
Depression			.783
Baseline illicit drug use			.225
Baseline marijuana use			.087
Baseline alcohol use			.220
Age	0.868	0.770, 0.978	.020
Baseline alcohol use x age			.217
Pre-baseline alcohol use			.880
Pre-baseline alcohol use x age			.813

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**4.0 RACE DIFFERENCES IN NEIGHBORHOOD-LEVEL OUTCOMES OF
WOMEN'S LIFETIME VIOLENT VICTIMIZATION**

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4.1 ABSTRACT

There were two aims of this study: 1) to determine whether lifetime victimization predicts two macro-level outcomes (neighborhood social disorganization and racial discordance), and 2) to examine whether the relation between lifetime victimization and macro-level outcomes (neighborhood social disorganization and racial discordance) is moderated by race. The data for these analyses were from two longitudinal studies in the Maternal Health Practices and Child Development project (MHCPD), which study the effects of prenatal marijuana and alcohol exposure on child development. The woman's history of traumatic events, including adult violent victimization, was assessed at the 14-year assessment. History of childhood maltreatment was collected at the 16-year assessment. Childhood victimization was measured with the Childhood Trauma Questionnaire (CTQ); which assesses exposure to physical, sexual and emotional abuse, and physical and emotional neglect during childhood. The Trauma Assessment for Adults, Self-Report Version (TAA) was used to measure AVV. Three categories of victimization since age 19 were considered for these analyses: sexual assault, physical assault with a weapon, and physical assault without a weapon. Data on macro-level factors was obtained from the U.S. Census Bureau's 2000 Census based on the participants' place of residence at the 16-year assessment. The selected census tract variables were: unemployment rate, educational attainment, employment type, percent owner occupied housing, percent renter occupied housing, percent below poverty level, percent elderly, percent female headed households, percent never married, child-to-adult ratio, male-to-female ratio, mean household income, percent never married, percent elderly, percent living in same house as in 1995, percent of households with social

security, supplemental security income (SSI), or public assistance, and percent vacant housing units. An additional variable, number of alcohol sources per census tract was also included. Cluster analysis was used to identify natural, dichotomous groupings of neighborhoods as either high or low social disorganization. Racial discordance was determined using census tract data on racial composition. The logistic regression models of lifetime victimization predicting neighborhood social disorganization and neighborhood race discordance were both non-significant. Race was the only significant predictor of social disorganization. When race was examined as a moderator of the relation between lifetime victimization and neighborhood race discordance, no significant results were obtained.

4.2 INTRODUCTION

Childhood abuse and neglect and adult intimate partner violence are common among women. Lifetime estimates of women's victimization include 3% for stalking, 17.6% for rape, and 51.9% for physical assault (Tjaden & Thoennes, 2000a). In addition to higher rates of rape, women experience significantly more frequent stalking than men where the rates are 8% and 2%, respectively. Although women experience fewer physical assaults than men (51.9% of women versus 66.4% of men), they are more likely to be injured as a result of physical assaults. Women are also more likely to experience repeated victimization. In the National Violence Against Women Survey, while men averaged 1.2 rapes, women who were raped in the previous 12 months averaged 2.9 rapes (Tjaden & Thoennes, 2000a).

The estimated rate of childhood maltreatment (CM) ranges from 49 to 124 per 1000 children age 18 and under in community samples (Finkelhor et al., 2005; Straus et al., 1997).

The most common types of self-reported maltreatment are physical and sexual abuse. Several studies have shown that forms of childhood maltreatment co-occur (Bensley et al., 2000; Briere & Runtz, 1990; Dong, Anda et al., 2004; Moeller, Bachmann, & Moeller, 1993; Scher et al., 2004). In a representative sample of 967 adult men and women from a U.S metropolitan area, Scher et al., found that 30% of women and 40% of men had experienced maltreatment and approximately 13% had experienced more than one form of CM (Scher et al., 2004).

Individuals victimized as children are at increased risk for adult violent victimization (AVV). The risk of specific (e.g. childhood sexual abuse followed by adult sexual assault) and non-specific (e.g. childhood sexual abuse followed by adult physical assault) revictimization was estimated in the National Violence Against Women Survey (NVAWS) (Tjaden & Thoennes, 2000a). Women who were physically or sexually abused during childhood were 2.5 to 3 times more likely to experience adult physical and sexual victimization, respectively, by an intimate partner than were women without such a history after adjustment for age, race, ethnicity, education, employment, and marital status (Tjaden & Thoennes, 2000a). Women with a history of childhood victimization were also at increased risk for victimization by individuals other than intimate partners. Women who experienced childhood physical or sexual abuse were between 1.3 and 4.8 times more likely to experience adult physical and/or sexual victimization, respectively, by a non-intimate partner (Desai et al., 2002).

4.2.1 Outcomes of Lifetime Violent Victimization

CM can affect its victims physically, psychologically, and socially. Children with a history of CM exhibit cognitive and language deficits, perform significantly lower on standardized tests, have lower grades, and are more likely to repeat a grade (Eckenrode et al.,

1993; National Research Council, 1993). Such difficulties in intellectual functioning and academic achievement can persist into adulthood (Malinosky-Rummell & Hansen, 1993; Perez & Widom, 1994), contributing to poverty or unemployment. Some of the individual-level outcomes associated with CM, which can appear during adolescence and persist into adulthood, include self-destructive behaviors, substance use, and psychiatric disorders such as depression, anxiety, and post-traumatic stress disorder. On the interpersonal-level, adults with a history of CM often have problems in relationships, including an increased likelihood of being unfaithful, walking out on, or divorcing a romantic partner (Colman & Widom, 2004; Gladstone et al., 2004; National Research Council, 1993).

AVV can also influence victims' lives in various ways. The mental health correlates of physical and/or sexual victimization are numerous, including anxiety (Gleason, 1993; Kemp et al., 1995), depression (Campbell et al., 1995; Gleason, 1993; Orava et al., 1996; Plichta & Weisman, 1995) hopelessness and low self-esteem (Janoff-Bullman, 1992), post-traumatic stress (Astin et al., 1993; Kilpatrick & Resnick, 1993), dissociation (Briere et al., 1997), somatization (Ullman & Brecklin, 2002), sexual problems (Briere et al., 1995), substance use (Epstein et al., 1998; Kilpatrick et al., 2000; Martin et al., 1998), and suicidality (Golding, 1999; Thompson et al., 2002; Ullman & Brecklin, 2002). Similar correlates have been identified for stalking and other forms of emotional or psychological abuse (Davis et al., 2002; Mechanic, 2002; Migeot & Lester, 1996; Pathe & Mullen, 1997; Vitanza et al., 1995).

Some of the immediate physical health effects of AVV include minor injuries such as scratches, bruises or welts, or more severe injuries like lacerations, knife wounds, broken bones, head and internal injuries, broken teeth, burns, or bullet wounds (Plichta, 2004; Tjaden & Thoennes, 2000a). Examples of the long-term health effects of IPV are traumatic brain injury

due to frequent, severe blows to the head. Chronic pain particularly that associated with disorders such as fibromyalgia, temporomandibular joint disorder, and gastrointestinal disorders has also been found among intimate partner violence victims (Plichta, 2004)

In addition to the physical and psychological consequences, victims of AVV often face a number of interpersonal consequences, including restricted access to information and services, isolation from social networks, and strained interactions with health providers and employers (Heise & Garcia-Moreno, 2002; Plichta, 2004). Research on female children and adolescents has shown that violent victimization has negative effects on their educational and socioeconomic attainment well into early adulthood (Macmillan, 2001). In addition, young adults with histories of AVV have lower educational attainment and lower occupational status as measured by income. A study of 3,600 women found that exposure to IPV in the previous year had a significant association with outcomes such as difficulty paying rent, mortgage or utility bills, frequent moves, and living in overcrowded conditions with family or friends (Pavao et al., 2007).

4.2.2 Ecological Model of Violent Victimization

Ecological models are a commonly used theoretical framework for research on the etiology and consequences of violent victimization. Such models, based on the work of Bronfenbrenner and Belsky, incorporate risk and protective factors for victimization on several interactive levels including characteristics of the individual, the individual's interpersonal relationships, community, and culture (Belsky, 1980; Bronfenbrenner, 1977, 1979). In an adaptation of the ecological model, Grauerholz (2000) details how the different levels of the model can be applied to sexual revictimization. In this model, sexual revictimization is a function of the victim's personal history (e.g. childhood sexual abuse), the context or relationship

in which the revictimization occurs (e.g. family or other relationship), the community (e.g. work, neighborhood), and the culture (e.g. cultural values, belief systems) (Grauerholz, 2000). Factors at each of these levels interact to contribute to an individual's risk for revictimization following exposure to CM.

An ecological approach can also be employed to describe the complex outcomes associated with CM, AVV, and revictimization (CM +AVV). For example, the outcomes reviewed above can be categorized into at least one level of the ecological model. Individual-level outcomes include physical and mental health effects. Interpersonal-level outcomes include marital and other relationship difficulties. And although no neighborhood-level outcomes have been explicitly linked to victimization, the interaction of effects at the individual and interpersonal level (e.g. lower occupational attainment x problem relationships) could logically relate to neighborhood-level outcomes like living in highly economically disadvantaged areas.

4.2.3 Race, Victimization, and Neighborhood

There are two theoretical concepts in the literature on race and neighborhood factors in health which may be important to CM-AVV outcomes research. The first is racial discordance, which refers residing in a geographic area that is predominantly inhabited by a different race/ethnicity. The impact of racial discordance on psychiatric conditions was demonstrated in a recent study by Veling et al., in which people of any race/ethnicity who were racially discordant with their neighborhood were found to have higher risk for psychotic disorders than individuals who lived in racially concordant neighborhoods (Veling et al., 2008). The impact of race discordance on CM was also demonstrated in a study by Friesthler et al., (2007). They found

that living in neighborhoods that had a higher percentage of African American residents was associated with lower rates of CM for African Americans.

The second important concept is derived from social disorganization theory, which posits that disruptions in neighborhood structures, which normally maintain social controls and realization of common values, lead to social disorganization (Sampson & Groves, 1989). Social disorganization is often conceptualized as an index of census tract or other political boundary-based variables, such as percentage of single parent households, percent non-white, percent unemployed, percent of families on public assistance, and percent below the poverty line (Sampson, Morenoff, & Earls, 1999).

There are racial differences in how social disorganization relates to the occurrence of both CM and AVV. Spearly and Lauderdale (1983) found that the proportion of children from affluent families and average monthly expenditures within the community (e.g. county) were associated with lower rates of maltreatment for Caucasian children while these factors were not significantly related to CM rates for Mexican American or African American children (Spearly & Lauderdale, 1983). A 1998 study by Korbin et al., found that neighborhood impoverishment had a significantly weaker effect on rates of CM in predominantly African American neighborhoods compared to predominantly Caucasian neighborhoods (Korbin, Coulton, Chard, Platt-Houston, & Su, 1998). Similarly, Friesthler et al., (2007) found that the neighborhood characteristics associated with CM differed by race: for African American children, higher percentages of households below the poverty-level and high alcohol outlet density were associated with higher rates of CM, and higher percentage of residents who had moved the previous five years was associated with lower rates of CM (Freisthler, Bruce, & Needell, 2007). The percentage of elderly residents, percentage of households below the poverty-level, and child-

to-adult ratio were associated with higher rates of CM for Caucasian children (Freisthler et al., 2007).

Race/ethnicity may also moderate the relation between socioenvironmental characteristics, like neighborhood poverty, and adult interpersonal violence (Cunradi et al., 2000). For example, while neighborhood poverty was significantly associated with AVV exposure for African Americans, neither household income nor neighborhood poverty were associated with AVV exposure for Caucasians (Cunradi et al., 2000).

4.2.4 Study aims and hypotheses

Although there is evidence that neighborhood characteristics are associated with both CM and AVV and that there are racial differences in these associations, less is known about the nature of those associations. These characteristics may be among the causal or predisposing factors, simple correlates of victimization, or part of a constellation of outcomes. The degree and nature of the influence of neighborhood characteristics on violent victimization is important for understanding the etiology of CM and AVV as well as informing potential levels of intervention.

Research on both CM and AVV has linked victimization exposure to a number of adverse outcomes that could plausibly influence the type of neighborhood in which victims ultimately reside. However, no research has examined neighborhood-level characteristics as an outcome of violent victimization. Thus, there were two aims of this study: 1) to determine whether lifetime victimization predicts two macro-level outcomes (neighborhood social disorganization and racial discordance), and 2) to examine whether the relation between lifetime victimization and macro-level outcomes (neighborhood social disorganization and racial discordance) is moderated by race.

4.3 METHODS

4.3.1 Participants, Design, Procedures

The data for these analyses are from two longitudinal studies of the effects of prenatal marijuana and alcohol exposure on child development. The combined studies comprise the Maternal Health Practices and Child Development project (MHCPD). Women aged 18 years and older were recruited from a hospital prenatal clinic at their first prenatal visit. The initial refusal rate was 15%. From this sample (N=1,360), two cohorts were selected: (1) women who consumed three or more drinks per week in the first trimester and (2) women who reported smoking two or more joints per month during the first trimester. A random sample of women who reported less or no

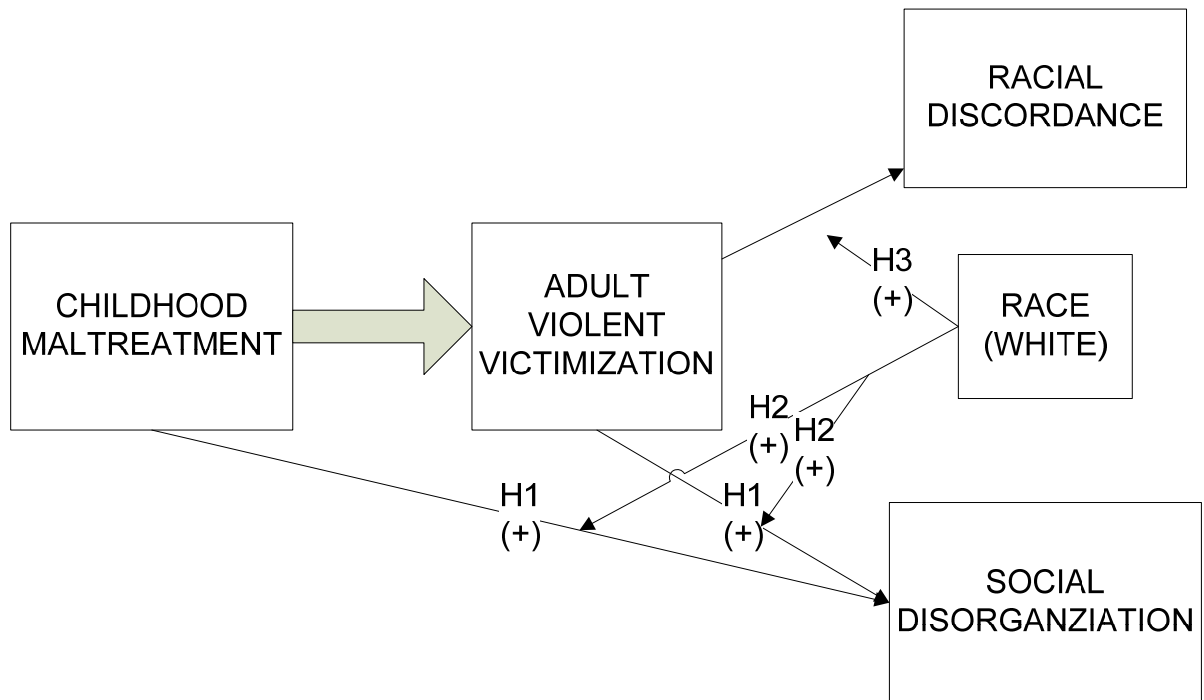


Figure 6. Conceptual model

consumption of alcohol or marijuana was also selected for each cohort. The combined cohorts which were used for these analyses use identical instruments, methods, and personnel.

Subsequent assessments occurred in the second and third trimester and at delivery. Seven hundred and sixty-three women with live, singleton births were followed-up at 8 and 18 months, and 3, 6, 10, 14, and 16 years postpartum. A standardized protocol which assessed maternal characteristics including psychological, social, and environmental factors, demographic status, and substance use, was used at each phase. At the 14-year assessment, the women's history of traumatic events, including adult violent victimization was obtained. History of childhood maltreatment was collected at the 16-year assessment.

In order to establish the proper temporal sequence between covariate/mediators and the outcome, data on covariates and potential mediators came from the baseline assessment, with the exception of social support, which was measured at the second assessment. At enrollment, all participants were age 18 and older. CM was based on events that occurred before age 18 and therefore occurred before the potential mediators were measured. All AVV occurred after age 19 but prior to the time at which the outcomes, neighborhood disorganization/racial discordance, were assessed.

Only women who attended the baseline, second, and 14- and 16-year assessments were included in these analyses (n=616). Data from 50 child guardians or custodians were excluded because these individuals were not present across all phases. At the 14-year assessment, there were 52 refusals, 49 participants had relocated, 69 were lost to follow-up and 18 other incomplete interviews (e.g. child died, in foster care, institutionalized, or placed outside of home, mother didn't complete). At the 16 year assessment, there were 52 refusals, 35 participants had relocated, 69 were lost to follow-up, and 33 other incomplete interviews. In addition, 182 women

did not complete both the CM and the AVV assessments. Of these women, 102 women who did not complete the AVV assessment at the 14-year assessment did complete it at the 16-year assessment. For these women, AVV data from the 16-year assessment was used if their reported AVV occurred prior to the 14-year assessment. This was done in order to ensure AVV occurred before the outcome was measured. The final sample (n=477) selected for these analyses did not differ from the total sample in terms of demographics or substance use at baseline.

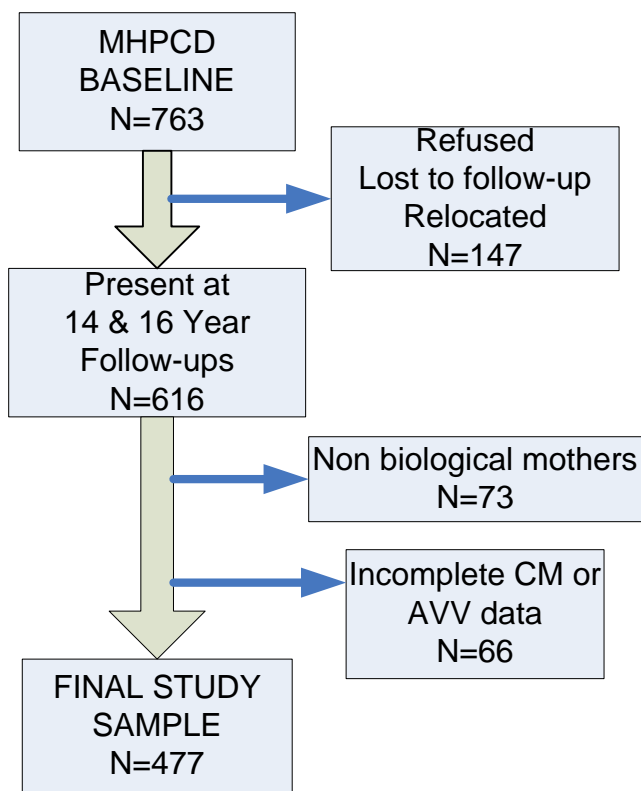


Figure 7. Sample size flow-chart

4.3.2 Measures

The Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) was used to measure childhood victimization. The revised CTQ consists of 25 self-report items that assess

exposure to physical, sexual, and emotional abuse, and physical and emotional neglect during childhood. Each item is rated by respondents on a Likert-scale ranging from 1) Never True to 5) Very Often True. Suggested cut-points for determining cases of abuse/neglect were utilized (Bernstein & Fink, 1998a). Reliability and validity statistics on each of the five subscales are good. (Bernstein & Fink, 1998a).

The Trauma Assessment for Adults, Self-Report Version (TAA; (Resnick et al., 1993)) was used to measure adult violent victimization. Sexual assault, physical assault with a weapon, and physical assault without a weapon were the categories of victimization considered for these analyses. Age at first and last occurrence was asked for each event (Resnick et al., 1993).

Individual level demographic measures were age, race, marital status, income, educational attainment, and employment status. Data on macro-level factors was obtained from the U.S. Census Bureau's 2000 Census based on the participants' place of residence at the 16-year assessment. Participant addresses were geocoded using ArcGIS: ArcMap version 9.1(ESRI, 1999-2005). Once geocoded, addresses were joined spatially to census tracts. Aggregate census-tract data were then linked to the MHPCD data. The selected census tract variables were: unemployment rate, educational attainment, employment type, percent owner occupied housing, percent renter occupied housing, percent below poverty level, percent elderly, percent female headed households, percent never married, child-to-adult ratio, male-to-female ratio, mean household income, percent never married, percent elderly, percent living in same house as in 1995, percent of households with social security, supplemental security income (SSI), or public assistance, and percent vacant housing units. An additional variable, number of alcohol sources per census tract was also included. Addresses for all state owned and operated wine and spirit outlets as well as private entities licensed to sell and/or distribute alcohol (beer, wine, or liquor)

were obtained from the Pennsylvania Liquor Control Board (PLCB). Once the addresses were linked to census tracts, the number of alcohol sources was tallied for each census tract.

Cluster analysis was used to identify natural, dichotomous groupings of neighborhoods as either high or low social disorganization based on Census and PLCB data. Three hundred-thirteen (64.4%) participants resided in low social disorganization neighborhoods; 167 (34.4%) lived in high social disorganization neighborhoods. To ensure there were significant differences in census tract variables between the groups identified in cluster analyses, independent sample t-tests were performed. In addition, the effect size of the group differences on each census tract variable was estimated using Cohen's d. The effect size of group differences between clusters was large for 18 (72%) of the census tract variables (Table 19) (Cohen, 1992a).

Racial discordance was determined using census tract data on racial composition. The median percentage of all census tract populations that was Caucasian for was used to dichotomize tracts as predominantly Caucasian or African American. Discordance represented a ratio of the participant's race in relation to the predominant race of their census tract. For example, a Caucasian woman who resided in a predominantly African American census tract was coded as discordant. Three hundred and ninety-five (81.3%) participants lived in non-race discordant neighborhoods; 85 (17.5%) lived in race discordant neighborhoods.

4.3.3 Data Analysis

Self-reported history of CM was dichotomized based on cut-points suggested for physical abuse, sexual abuse, physical neglect, emotional abuse, and emotional neglect (Bernstein & Fink, 1998a). Those who scored in the severe or extreme range for each CM form were coded as "1" and those who scored in the ranges of moderate, low, minimal, or no maltreatment were coded as

“0”. Self-report of AVV was dichotomized. Exposure to one or more forms of AVV was coded “1”. Revictimization was calculated based on the dichotomous CM and AVV variables. If respondents reported CM and AVV, revictimization was coded “1”. All other response combinations were “0” for revictimization. Lifetime victimization was examined as a composite variable of CM, AVV and revictimization. There were four categories: no victimization, CM only, AVV only, and revictimized.

Both outcome variables, neighborhood social disorganization and neighborhood race discordance, were dichotomous. Binary logistic regressions were used to examine separately the relation between lifetime victimization and neighborhood social disorganization and race discordance. To determine whether these relations were moderated by race, logistic regressions of CM, AVV, and revictimization on the outcome variables were conducted. The exposure, race, and the interaction term of exposure with race were entered as a block into each regression.

4.4 RESULTS

There were slightly more African American women (54.5%) than Caucasian women in the MHPCD sample included in these analyses. The mean monthly household income of the sample ranged from \$455 at baseline to \$2,142 at the 16-year follow up. At baseline, the majority of women were unemployed (73%) and unmarried (67%). By the 16 year follow-up, only 27% were unemployed but the majority (60%) remained unmarried (Table 20).

The prevalence of CM was higher in Caucasian women (39%) than in African American women (20%) (Table 20). Caucasian women also reported a higher prevalence of AVV than African American Women (19% vs.11%). Forty-one African American women (15.5%) and 61

Caucasian women (27.6%) reported CM without subsequent AVV. Adult victimization only, in absence of prior CM, was reported by 16 (6.0%) African American women and 17 (7.7%) Caucasian women. Twelve African American women (4.5%) and 25 Caucasian women (11.3%) who reported both child and adult victimization were classified as revictimized. The only baseline demographic variable for which there was a significant difference in reported lifetime victimization was race (Table 21). The groups reporting CM, AVV, and revictimization were comprised of more Caucasians.

The logistic regression models of lifetime victimization predicting neighborhood social disorganization and neighborhood race discordance were both non-significant based on the Omnibus Chi-square tests (Table 23). When logistic regressions were performed to examine whether race moderated the relation between lifetime victimization and neighborhood social disorganization, all three models (for CM, AVV, and revictimization) were significant (Table 24). In each model however, race was the only significant predictor of social disorganization. Caucasian women were between 5.9-7.1% less likely to live in areas of high social disorganization than African American women, even after controlling for victimization. Neither victimization (CM, AVV, revictimization), nor the interaction terms of race with each form of victimization (race*CM, race*AVV, race*revictimization) were significantly related to living in areas of high social disorganization. When race was examined as a moderator of the relation between lifetime victimization and neighborhood race discordance, no significant results were obtained. (Table 25).

Two post-hoc, simple logistic regressions, were conducted to examine the relation between race and neighborhood social disorganization and race and neighborhood race discordance independent of victimization (Table 26). Both models were significant: race

significantly predicted both neighborhood social disorganization (OR: 0.069, 95%CI: 0.04, 0.12) and neighborhood race discordance (OR: 0.607, 95%CI: 0.37, 0.99). Based on the Nagelkerke's R-square values from the regression models, race alone described approximately 34% of the variation in neighborhood social disorganization but only 1.4% of the variation in neighborhood race discordance.

4.5 DISCUSSION

The aims of this study were to examine whether victimization history is associated with neighborhood-level outcomes and whether these neighborhood –level outcomes differ by race. The first hypothesis, that victimization would be associated with higher likelihood of living in areas of high social disorganization, was not supported by the data. Next, we tested whether race moderated the association between victimization and living in areas of high social disorganization. This hypothesis was also not supported. Even when accounting for the effects of race, the women's victimization history did not alter the likelihood of living in areas of high social disorganization. The final hypothesis was that victimization history and race would jointly affect the women's likelihood of living in racial discordant neighborhoods. In our study, however, there was no direct effect of victimization history on likelihood of living in race discordant neighborhoods. Neither the addition of race nor the interaction term between race and victimization had an impact on the relation of victimization history to race discordance in the women's current neighborhood.

4.5.1 Limitations

A limitation of this study is the strategy used for defining neighborhoods. The level of heterogeneity of neighborhood characteristics within Census tracts, which are on average comprised of approximately 4,000 residents, do not necessarily coincide well with how neighborhood residents may conceptualize their residential areas (O'Campo, 2003). Furthermore, important neighborhood social processes like political participation, social support, or psychological sense of community are not taken into account in determination of census tract boundaries. Though using Census tracts as spatially defined proxies for neighborhoods has its limitations, it is commonly used in multi-level studies (Benson et al., 2003; Coulton, Korbin, Su, & Chow, 1995; Freisthler et al., 2007; Korbin et al., 1998; O'Campo, 2003); therefore our methodology is comparable to that of other recent studies.

The women in this study were selected from a prenatal clinic based on their use of alcohol and marijuana during the first trimester of pregnancy. Although the sample included women who did not use alcohol or marijuana during pregnancy, a majority of the women were light to moderate users of either or both substances at baseline. In addition, the subjects represent a low-income population and are fairly homogeneous with regard to most demographic variables other than race. These factors limit the generalizeability of these results to other populations.

The geographic area of study is an additional limitation. More than 85% of the sample resided in counties in southwestern Pennsylvania and more than 55% were from urban areas. The geographic and socioeconomic homogeneity of our sample may have limited our ability to detect significant neighborhood-level effects.

An additional limitation is the retrospective nature of data on both CM and AVV. Women were asked at the 16-year follow-up, when respondent ages ranged from 34-58, to report

on events that had occurred before age 18. AVV was assessed at the 14-year follow up, at which the respondents' ages ranged from 32-57 years. Therefore, women may have had to recall incidents that occurred up to fifty years earlier. This is a potential source of bias. However, both the CTQ and TAA instruments used in this study have previously been shown to be valid and reliable in collection of retrospective reports of victimization.

Possibly as a result of these limitations, this study did not yield any significant associations between violent victimization history and current neighborhood. It remains unknown whether the high correlations between rates of CM and AVV and neighborhood characteristics in other studies are the result of social processes like limited support for parenting and child development or simply the concentration of disadvantaged individuals, many who may have histories of lifetime violent victimization, within close geographic proximity to one another. In addition to lack of understanding of the mechanism, due to the preponderance of cross-sectional studies in this area, we do not know whether neighborhood and individual correlates of victimization are risk factors, outcomes, or both. Because of the implications for intervention and prevention of CM and AVV, prospective multi-level studies, which can demonstrate the temporal relationship between lifetime victimization and neighborhood characteristics, are an important next step to understanding the nature of that relation.

Table 19. Effect sizes for tests of differences between clusters

Census tract variable	Cohen's d
% female headed households w/children	1.433
% population 15+ never married	1.698
% living in same house as in 1995	0.565
% unemployed	2.028
% HH w/ social security income	2.272
% HH w/ supplemental security income	0.243
% HH w/ public assistance	2.288
% population living below poverty level	2.706
% owner occupied housing units	1.848
% renter occupied housing units	1.227
% vacant housing units	1.678
% population age 65+	0.091
% population with high school education or less	1.178
% population age 25+ w/some college; no degree	.0149
% population age 25+ associate/bachelor degree	0.955
% population age 25+ master's/doctorate/professional degree	0.712
% population management/professional occupations	1.716
% population in service occupations	2.205
% population in sales/office occupations	0.235
% population in farming/fishing occupations	0.424
% population in construction occupations	0.980
% population in production occupations	0.170
Child/adult ratio	1.426
Male/female ratio	0.591
Alcohol sources per tract	0.225

Guidelines:

small: $d \leq .2$

medium: $.2 < d \leq .5$

large: $.5 < d \leq .8$

Small difference between clusters on 3 (12%) variables

Medium difference between clusters on 3 (12%) variables

Large difference between clusters on 18 (72%) variables

Table 20. Sample characteristics

n=477	Baseline	14 year follow-up* n (%)	16 year follow-up
Race			
Black		258 (54.1)	
White		219 (45.9)	
Marital Status			
Single	317 (66.5)	243 (50.9)	281 (58.9)
Married	160 (33.5)	196 (41.1)	195 (40.9)
Work Status			
Unemployed	347 (72.7)	100 (21.0)	123 (25.8)
Employed	130 (27.3)	339 (71.1)	354 (74.2)
Monthly Income (\$)	461	1887	2102
Age (years)	23.0	38.3	40.3
Education (years)	11.8	12.5	12.2

Table 21. Prevalence of violent victimization by race

n=477	African American n (%)	Caucasian n (%)
Childhood Maltreatment		
None	205 (79.5)	135 (61.6)
Any	53 (20.5)	84 (38.4)
1 form	22 (8.6)	28 (12.9)
2 forms	16 (6.2)	26 (12.0)
3 forms	6 (2.3)	15 (6.9)
4 forms	4 (1.6)	9 (4.1)
5 forms	4 (1.6)	4 (1.8)
Adult Violent Victimization		
None	231 (89.5)	177 (80.8)
Any	27 (10.5)	42 (19.2)
1 form	18 (7.0)	28 (12.9)
2 forms	6 (2.3)	12 (5.5)
≥3 forms	3 (1.2)	0 (0.0)
Lifetime Victimization		
None	188 (72.9)	117 (53.4)
Childhood only	43 (16.7)	60 (27.4)
Adult only	17 (6.6)	18 (8.2)
Both (revictimized)	10 (3.9)	24 (11.0)

Table 22. Baseline demographic characteristics by exposure

	%Black	%Single	%Employed	Mean Monthly Income	Mean Age	Mean Years Education
Lifetime Victimization	p<.005	NS	NS	NS	NS	NS
None	62.4	68.2	71.7	446	23.0	11.9
Childhood only	40.2	63.7	76.5	446	23.2	11.6
Adult only	48.5	63.6	66.7	491	23.1	12.3
Both (revictimized)	32.4	67.6	81.1	519	21.9	11.8

Table 23. Lifetime victimization predicting neighborhood characteristics

Victimization predicting neighborhood social disorganization	
Logistic Regression $\chi^2=3.539$ p=.316	OR (95%CI)
Predictor- Lifetime Victimization	
None	referent
Childhood only	.828 (.51, 1.33)
Adult only	.658 (.29, 1.47)
Revictimized	.540 (.25, 1.19)
Victimization predicting race discordance	
Logistic Regression $\chi^2=1.866$ p=.601	OR (95%CI)
Predictor- Lifetime Victimization	
None	referent
Childhood only	1.373 (.786, 2.399)
Adult only	.901 (.332, 2.448)
Revictimized	.761 (.283, 2.042)

Table 24. Moderation of relation between lifetime victimization and neighborhood social disorganization by race

Logistic Regression Model Omnibus $X^2(3)= 133.91$ p<.001 Nagelkerke $R^2=.339$ Predictors	OR	95% CI	p-value
Childhood Maltreatment			.413
Race (Caucasian)	.059	.028, .122	.000
CM*Race			.595
Logistic Regression Model Omnibus $X^2(3)= 136.40$ p<.001 Nagelkerke $R^2=.341$ Predictors	OR	95% CI	p-value
Adult Violent Victimization			.903
Race (Caucasian)	.071	.040, .129	.000
AVV*Race			.848
Logistic Regression Model Omnibus $X^2(3)= 136.40$ p<.001 Nagelkerke $R^2=.341$ Predictors	OR	95% CI	p-value
Revictimization			.904
Race (Caucasian)	.070	.039, .123	.000
Revictimization*Race			.906

Table 25. Moderation of relation between lifetime victimization and neighborhood race discordance by race

	OR	95% CI	p-value
Logistic Regression Model			
Omnibus $X^2(3)= 7.527$ p=.057			
Nagelkerke $R^2=.026$			
Predictors			
Childhood Maltreatment			.975
Race (Caucasian)	.444	.23, .85	.014
CM*Race			.168
Logistic Regression Model	OR	95% CI	p-value
Omnibus $X^2(3)= 4.438$ p=.218			
Nagelkerke $R^2=.015$			
Predictors			
Adult Violent Victimization			.747
Race (Caucasian)			.075
AVV*Race			.955
Logistic Regression Model	OR	95% CI	p-value
Omnibus $X^2(3)= 4.391$ p=.222			
Nagelkerke $R^2=.015$			
Predictors			
Revictimization			.712
Race (Caucasian)			.057
Revictimization*Race			.915

Table 26. Post-hoc analysis: Race predicting neighborhood characteristics

Race predicting neighborhood social disorganization	
$\chi^2=136.291$ p=.000 $R^2= .341$	OR (95%CI)
Race (white)	.069 (.04, .12)
Race predicting neighborhood race discordance	
$\chi^2=4.165$ p=.041 $R^2= .014$	OR (95%CI)
Race (white)	.607 (.373, .987)

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5.0 DISCUSSION

5.1 SUMMARY OF STUDY OBJECTIVES

The goal of this research was to examine the role of race in the association between childhood maltreatment (CM) and adult violent victimization (AVV) and related socioeconomic outcomes among adult women. Three aims guided this research: (1) to characterize the association between CM and AVV, (2) to examine whether there are racial differences in the association between CM and AVV, and (3) to determine whether victimization history (CM, AVV, CM+AVV) is associated with characteristics of the neighborhood in which adult women reside.

5.2 SUMMARY OF RESEARCH FINDINGS

With regard to the first research aim, the results demonstrated an increased likelihood of experiencing AVV among women who reported a history of CM. A strength of this study is our ability to consider all forms of childhood and adult victimization, thereby addressing an important limitation of the existing body of research. Only one factor, illicit drug use, was found to mediate the CM-AVV relation. However, because CM remained a significant predictor of AVV, we concluded that illicit drug use only partially mediated the relation.

Next, we explored a dose-response relation between the number of forms of CM experienced and likelihood of experiencing AVV. Compared to women who experienced one form of CM, the likelihood of experiencing AVV was slightly higher for those exposed to two forms of CM. Because the odds ratios overlapped, the difference in odds ratios was not significant. Women who experienced 3 or more forms of maltreatment were not at increased odds of reporting AVV compared to women without a history of CM. Several possible explanations for the absence of a dose-response relation were proposed. The first was decreased statistical power resulting from the use of categories of exposure (0 - 4+). Other research suggests that women at higher levels of CM exposure have been found to perpetrate violence or utilize coping strategies like avoidance, which decreases their exposure to potential perpetrators (Classen et al., 2005; Whitfield et al., 2003); we were not able to examine these proposed associations in this sample. Other studies have found that cognitive changes resulting from exposure to increasing forms of CM, that affect women's' perceptions of, reactions to, or willingness to disclose adult victimization, may also explain the observed relation between CM and AVV (Arata, 2000; Breitenbecher, 2001; Irwin, 1999; Messman & Long, 1996).

The second aim explored racial differences in the association between CVV and AVV as well as in mediation and moderation of that relation. By contrast to the literature, we found that the prevalence of CM was higher among Caucasian women compared to African American women. The restriction of our sample to low-income women, and use of self-report rather than official Child Protective Service agency data may help explain the disparity between our study and prior research. Also in contrast to the literature, Caucasian women in our sample reported more AVV than African American women. The higher rate of marriage among Caucasian

women in our sample may help explain this finding due to the fact that the majority of violence that women experience occurs within the context of marital or other intimate relationships.

The odds ratios associated with any CM exposure were almost equal for African Americans and Caucasians. To our knowledge, this represents a novel finding. We did find racial differences in our race-specific analyses of a dose-response relation between CM and AVV. For African Americans, the only level of CM exposure that significantly predicted AVV was one form of CM. For Caucasian women, exposure to one and two forms of CM increased the odds of AVV. As in the analyses of the full, non-stratified sample in the first aim, exposure to three or more forms of CM did not increase the odds of experiencing AVV. Decreased statistical power in these stratified analyses may account for the limited number of significant findings.

We hypothesized that mediation of the CM-AVV relation would differ by race. When we explored racial differences in mediation of the CM-AVV relation, we found that none of the fifteen variables examined was a significant mediator among African American women. The results for Caucasian women were similar to the full sample; illicit drug use partially mediated the CM-AVV relation. These results also represent new findings. One previous study in a sample of African American women included a significant proportion of inpatient psychiatric or substance abuse treatment patients (Bender et al., 2003). Social support was a mediator of the relation between all forms of CM and intimate partner violence in this study. Differences in sample composition and outcome definition may explain the discrepancy between ours and the aforementioned study with regard to significant mediators in the CM-AVV relation among African Americans. We found no significant moderation of the CM-AVV relation among either race.

The third research aim addressed racial differences in neighborhood-level outcomes associated with women's lifetime violent victimization. Contrary to our hypotheses that victimization history would be associated with neighborhood outcomes, neither CM, AVV, nor revictimization (CM+AVV) was associated with living in neighborhoods that were highly socially disorganized or racially discordant with the participant's race. The socioeconomically homogeneous nature of our sample may have limited our ability to detect associations between victimization and neighborhood level outcomes.

5.3 LIMITATIONS

There were some limitations in our research. First, the women in this study were selected from a prenatal clinic based on their alcohol and marijuana use during early pregnancy. These women were a low-income, primarily urban population, and were fairly homogeneous on demographics other than race. Therefore, the generalizeability of our results is limited to this group.

An additional limitation in our study design was the retrospective ascertainment of both CM and AVV. Recall bias is a potential issue in this study. However, the instruments used in this study are reliable and valid for retrospective study of victimization and are commonly used in the literature. The outcome, AVV was also ascertained prior measuring the exposure (CM). However, the CTQ instructs participants to consider events that occurred prior to age 18 and the TAA prompts for events during both before and after age 18 which made us confident that events reported were properly classified. Although having been questioned about lifetime traumatic events at an earlier assessment may have increased the later recall of childhood events, all

women would have been equally affected and we believe that any effect on the results would have been negligible.

Because our sample was drawn primarily from urban areas in and around Pittsburgh, there was little geographic heterogeneity. This may have limited our ability to detect neighborhood-level differences associated with victimization history.

A final limitation was the method used to define neighborhoods. Although census tracts are commonly used as proxies for neighborhoods, they may not align well with meaningful, participant-defined neighborhood boundaries (Coulton, Korbin, Chan, & Su, 2001). However, because census-tract data are readily available while other sources are not, they have been used in numerous multi-level studies (Benson et al., 2003; Coulton et al., 1995; Freisthler et al., 2007; Korbin et al., 1998; O'Campo, 2003), making our methodology comparable to others in the literature.

5.4 PUBLIC HEALTH SIGNIFICANCE/IMPLICATIONS

The most important research finding from this study is that victimization in childhood has direct effects on the risk of victimization in adulthood. When all forms of CM exposure are considered there is a substantial increase in the odds of experiencing AVV, both intimate partner violence and non-intimate partner violence. It is important to note that violent revictimization is not limited to the context of intimate relationships. These findings have implications for subsequent research in the developing area of revictimization as a long-term outcome of childhood maltreatment, as well as the separate research literatures on CM and AVV.

In addition, our results indicate that illicit drug use during early pregnancy is a partial mediator of the relation between CM and AVV among Caucasian women. This suggests that approaches to prevent revictimization may need to differ depending on race, and that drug interventions may be more relevant for Caucasian women.

Regardless of victimization history, race was the only predictor of neighborhood-level outcomes in our sample, despite evidence in the literature that victimized women are at high risk for housing instability and socioeconomic disadvantage. Although our hypotheses were not supported, we feel strongly that this question demands further exploration

5.5 FUTURE DIRECTIONS

One of the most important follow-up steps to this study would be to replicate these analyses in a larger, more economically, geographically, and racially diverse sample. This would address our limited statistical power in analyses that were stratified by race. Replication of these analyses in a larger sample could also provide more insight to whether there is a dose-response relation between forms of CM and AVV and it will also increase the generalizability of results beyond the population used here.

Another related future step would be to more closely examine other mediators. In addition to exploring variables that were not available in our dataset, we hope to examine whether the recency of the potential mediator(s) in relation to AVV increases their significance. The mediators examined in this study were all measured fourteen years prior to ascertainment of AVV. It is likely that variables like alcohol use, that are known to be associated with both CM and AVV, did not emerge as mediators in our analyses because they were too distal from the

outcome. Using data from one to five years prior to ascertainment of AVV may impact which variables are identified as mediators. Longitudinal analyses that allow consideration of potential mediating factors at multiple time points would be ideal. Supplementing longitudinal analyses of women's revictimization with data on changes in neighborhood-level factors would also advance knowledge of the nature of the neighborhood as an outcome of violent victimization history.

6.0 BIBLIOGRAPHY

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