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Adolescent Male Perpetrators of Rape in the General Population and Their Young Adult Outcomes

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by

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ABSTRACT OF THE DISSERTATION

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The Centers for Disease Control (CDC) estimated that 10.6 % of adult women and 2.1% of adult men were sexually assaulted in their lifetimes (Basile, Chen, Black, & Saltzman, 2007). Approximately 16% of single offender sexual assaults and rapes and nearly 32% of multiple offender sexual assault and rapes were perpetrated by adolescents and young adults in 2007 (Maston & Klaus, 2010). Researchers estimated sexually violent behavior among adolescent males in the general population at rates of 2.2 to 10% (Ageton, 1983; Banyard, Cross, & Modecki, 2006; Borowsky, Hogan, & Ireland, 1997).

Despite the scope of the problem, there is limited understanding of the risk and protective factors associated with the perpetration of rape among non-incarcerated adolescent populations. This hampers the development of effective means of prevention and intervention with groups that are not already incarcerated or engaged in mental health treatment. Moreover, the data on the prevalence of rape in the general adolescent population needs updating—the only study using a nationally representative sample was over three decades old (Ageton, 1983).

In this study data from the National Longitudinal Study of Adolescent Health (Add Health) was used to examine risk and protective factors for male adolescent rape perpetrated

against females. Individual factors, family environment, peer relationships, and neighborhood characteristics were examined for juveniles reporting perpetrating rape as compared to other self-reported violent and non-violent delinquents and non-offending adolescents using logistic regression analysis. Longer term trajectories are also important to inform intervention. Among male youth reporting adolescent onset rape, young adult indicators of later adjustment were explored—high school graduation, full time employment and school, stable romantic cohabiting, inter-personal physical and sexual violence and arrest. These young adult outcomes were analyzed using binary logistic regression approaches. Findings have implications for tailoring programs for the prevention of rape as well as intervention with adolescents who perpetrate rape.

Chapter 1

Introduction

Rape perpetration inflicts high mental health, medical, financial, educational, and social costs on both victims and perpetrators. Currently little information is available to guide service systems in understanding what approaches are more likely to prevent rape among general population youth and what intervention strategies are most effective with youth who perpetrate rape. There is limited understanding of the risk and protective factors associated with rape in adolescence, especially how individual factors, family environment, peer group, and neighborhood factors may influence the etiology of these behaviors among general population youth. There is also limited information about whether there are subgroups of adolescents who perpetrate rape who appear to have normative transitions into young adulthood. In this study risk and protective factors for perpetrating rape among a nationally representative sample of adolescent males using factors known to be associated with sexually violent behaviors among incarcerated and clinical populations were examined. Also, young adult indicators of success and failure—high school graduation, full time employment/school, stable romantic cohabiting, and arrest—were explored.

First this study used logistic regression analysis techniques to analyze panel data from the National Longitudinal Study of Adolescent Health (Add Health) to understand what factors were uniquely associated with adolescent onset rape versus other violent delinquency, non-violent delinquency, and non-delinquency. Second, young adult indicators of success and failure—high school graduation, full time employment/school, stable romantic cohabiting, and arrest—were explored for those who self reported perpetrating rape in adolescence using binary logistic

regression analysis techniques. The findings of this study have implications for prevention and intervention programs and policies affecting youth who perpetrate rape.

Aim 1: To examine which individual, family, peer and neighborhood factors contribute to or protect from adolescent onset rape using a nationally representative general population sample of male adolescents.

Hypothesis 1a: Youth with a history of maltreatment will be more likely to perpetrate rape.

Hypothesis 1b: Youth with a history of aggression toward peers will be more likely to perpetrate rape.

Aim 2: To explore early adult indicators of success and/or failure—high school graduation, full time employment/school, stable romantic cohabiting, and arrest—for those who self-reported perpetrating rape in adolescence. There is no hypothesis for this Aim as there is no literature on later development of youth who perpetrate rape outside of incarcerated populations. Further, there is no literature that attempts to understand if there is a subset of these youth that appear to have more normative young adult outcomes.

Chapter 2

Background and Significance

Studies on sexually violent youth date back 60 years (Atcheson & Williams, 1954; Doshay, 1943), however older studies were often purely descriptive with small samples of incarcerated juvenile sex offenders. Although some of these methodological problems continue, the methodology has notably improved in more recent years. Therefore this review focused on studies published in 1995 and later. A few exceptions were made for earlier germinal studies that remain of import to the subject.

What is Sexual Violence?

According to the Centers for Disease Control and Prevention, sexual violence is any sexual activity in which consent is not obtained or freely given. There are many possible forms of sexual violence including sexual harassment, threats, intimidation, peeping, taking nude photos, unwanted touching, and rape. Sexual violence includes contact and non-contact activities (Centers for Disease Control and Prevention, 2009). This definition is quite broad and it is important to note that research studies often use different definitions of sexual violence and measure different aspects of sexual violence. Some studies measure only heterosexual vaginal penetration, others include penetration and other types of unwanted sexual touch. This study examined rape, defined as physically forced sexual intercourse perpetrated by an adolescent male against a female.

Sex offenders, adolescent or adult, are those who have been convicted of a sex offense in a juvenile or adult court. In other words, those who may have engaged in sexually violent behaviors, but are not convicted of an offense are not called “sex offenders”. Other terms that

describe those who are not convicted of sex offenses include sexually violent, sexually harmful, sexually aggressive, sexual abuser, perpetrator, pedophile, and child molester.

Estimates of Incidence and Prevalence

Although the focus of this study is rape perpetration, knowledge of sexual violence victimization is also important for understanding the scope and significance of sexual violence. Estimates of victimization provide information about the impact of sexual violence on individuals, communities, and society as a whole. Estimates of perpetration give a sense of the numbers of youth that may need treatment or prevention programming in order to decrease the incidence of sexual violence. For clarity, the specific definition of sexual violence that was used for each study was specified.

Sexual victimization. The Centers for Disease Control (CDC) estimated that 10.6% of adult women and 2.1% of adult men have experienced forced sex in their lifetimes. Forced sex was defined as vaginal, anal, or oral penetration against the respondents will, including situations in which the respondent was unable to give consent such as young age or intoxication (Basile, Chen, Black, & Saltzman, 2007). Researchers on The National Violence Against Women Survey found that 17.6% of women and 3% of men reported having been raped (including attempted and completed rapes) in their lifetime. In the 12 months prior to participating in the survey, 0.3% of women and 0.1% of men reported experiencing attempted or completed rape. Rape was defined as an incident that occurred without the respondent's consent that involved penetration of the vagina or anus by body parts (penis, tongue, or fingers) or objects or penetration of the mouth by the penis (Tjaden & Thoennes, 2006). Studies of college age women indicate that between 13 and 18.8% experienced a completed rape in high school or college. Rape was defined as engaging in sexual intercourse in which physical force was used to coerce the intercourse (Gross,

Winslett, Roberts, & Gohm, 2006; Koss, Gidycz, & Wisniewski, 1987; Koss & Oros, 1982; Testa, Vanzile-Tamsen, Livingston, & Koss, 2004). Among female high school students in Massachusetts 10.1% reported experiencing sexual violence in the context of a dating relationship in 1997 and 9.1% reported the same in 1999. Sexual violence was defined as being forced into any sexual activity in the context of a dating relationship (Silverman, Raj, Mucci, & Hathaway, 2001).

Women are sexually victimized at significantly higher rates than men. Some of the difference in rates may be explained by men's stronger reluctance to report sexual victimization due to increased stigma and embarrassment (Tjaden & Thoennes, 2006). However it seems that both genders tend to under report sexual abuse (Basile et al., 2007).

Sexual violence perpetrated by adolescent males. Although women do perpetrate sexual violence, studies have shown that boys and men perpetrate the vast majority of sexual violence (93 to 98%) (Fehrenbach, Smith, Monastersky, & Deisher, 1986; Ryan, Miyoshi, Metzner, Krugman, & Fryer, 1996; Wasserman & Kappel, 1985). This makes a strong case that the main focus of sexual violence prevention and intervention should be on boys and men. Moreover, a substantial portion of known sexual violence is perpetrated by adolescent males. Males under age 18 were arrested for 14.4% of all forcible rapes in 2009 and 17.2% of all sex offenses in 2009 (U.S. Department of Justice, Federal Bureau of Investigation, 2010). The Uniform Crime Report (UCR) was compiled by the U.S. Department of Justice, Federal Bureau of Investigation, and consists of arrest data submitted by nearly 17,000 city, county, state, tribal, and federal law enforcement agencies. The limit of arrest data is that it only captures perpetrators who were actually caught and arrested—a potentially high hurdle given concerns about the under reporting of sexual violence.

General population studies. General population studies had prevalence estimates that vary widely and were usually limited to single states. Further the studies vary according to how sexual violence was measured. It should be noted that two well known studies were excluded from this review due to concerns about methodological flaws that create serious questions as to the validity of their estimates of sexual violence (Wolfgang, Figlio, & Sellin, 1972; Zimring, Piquero, & Jennings, 2007). (Although the Zimring, Piquero & Jennings study was published in 2007, the data used for the study was collected in the 1960's and 1970's). These two studies are quite old and used public records of sex offenses to assess prevalence. When only public records are used to measure sexual violence then any cases in which law enforcement does not have knowledge of the incident are not included. Therefore, for the incident to be counted either the victim or a witness must report, the perpetrator must self-report or the incident must literally be seen by the police. The age of the data, which was collected in the 1960's and 1970's, compounds this problem because sexual offenses were even less likely to be reported than presently (Tjaden & Thoennes, 2006).

Ageton (1983) completed a national study of sexual assault behaviors among adolescents using the National Youth Survey (NYS) data from 1978-1980. Although three decades old, this study was the most recent nationally representative general population study of sexual assault behaviors. In this study, measurement of sexual assault consisted of all forced sexual behavior that included contact with the sexual parts of the body. This study found that 3.8% of the males (n=863) reported perpetrating sexual assault in 1978, 2.9% (n=805) in 1979, and 2.2% (n=783) in 1980. The study did not find any differences among perpetrators in race, social class, or geography. Questions regarding the nature of pressure or force used to coerce the victim ranged

from verbal persuasion, such as “If you love me, you will” or “I’ll break up with you if you don’t’’ to use of a weapon or physical force (Ageton, 1983).

Banyard and colleagues (2006) reported a secondary data analysis on data collected from 7-12th grade students in 10 school administrative units across Wisconsin in 2000-2001. The authors used the only three school administrative units that collected data on the perpetration of sexual abuse and coercion, leaving a sample of 980. Among the 470 males participants 10% reported perpetrating sexual coercion in response to the question “Have you ever made someone do something sexual that they didn’t want to do?” (Banyard et al., 2006). Although the sample was relatively large, generalizability was limited given that only three of 10 administrative units included questions about sexual violence and the study was limited to a single state.

In a 1992 survey of approximately 133,000 high school students in Minnesota from 433 of 434 school districts, Borowsky and colleagues (1997) found that, 4.8% of high school males acknowledged forcing someone into a sexual act. The limitations of this study are that the data was based only on self report with no public records check or collateral reports in a single state. However, the survey was anonymous which some researchers believe improves the validity of self report data when asking about illegal or socially unacceptable behaviors (Huizinga & Elliott, 1986; Huizinga, 1991).

Overall it seems that a small percentage of male adolescents in the general populations perpetrate sexual violence (2.2-10%). Additionally, it is clear from reviewing a variety of studies that more consistency in how sexual violence in measured across studies is needed. Table 2.1 has more methodological details of the general population studies.

Table 2.1: Summary of General Population Studies **(N=3)**

Author/Date	Region	Sample Size	Gender	Perpetrator %	Records or Self-Report
Ageton, 1983	Nation-wide	N=1,725	M	3.8% in 1978 2.9% in 1979 2.2% in 1980	Self-Report
Banyard, et al., 2006	Wisconsin	N=980	M/F	10.0% of males 2.5% of females	Self-Report
Borowsky, et al., 1997	Minnesota	N=71,594	M/F	4.8% of males 1.3% of females	Self-Report

College-age retrospective recall studies. Although the college population is generally considered adult, some studies included retrospective questions about behavior that occurred in adolescence. A summary table appears at the end of this section.

Abbey and McAuslan (2004) offered a longitudinal study of sexual assault perpetration among college males at an urban commuter college in Michigan. They found that among those who completed both Time 1 and Time 2 surveys (N=197), 35% (n=52) of men report committing at least one sexual assault since age 14 at Time 1. There was a range of severity of the assault; forced sexual contact (16.8%), verbally coerced intercourse (9.6%), and attempted or completed rape (8.6%). At Time 2, 14.2% (n=28) reported a sexual assault during the one year follow up period; 17 of these were repeat offenders. Forced sexual contact was 5.6%, verbally coerced intercourse was 4.1%, and attempted or completed rape was 4.5%. This study is limited by its high attrition rate between Time 1 and Time 2, possibly due to switching from in-person surveys at Time 1 to mailed surveys at Time 2.

A study conducted in rural Madison County, Georgia interviewed 65 young adult men, average age 19.9 years (SD=1.3) about their lifetime sexually aggressive behaviors. The sample was 93.8% Caucasian and 49.2% had completed some or graduated from college (Calhoun, Bernat, Clum, & Frame, 1997). The participants were categorized by the most severe act of

sexual aggression that they reported. Sexual coercion was the most severe act committed by 9.5%; 6.4% admitted to rape as their most severe behavior. Of the sexually aggressive participants, 86% endorsed more than one type of sexual aggression. This study is limited by the small sample size and a lack of geographic and racial diversity.

In one of the earliest studies that examined sexual violence on college campuses (N=6,159), Koss and colleagues (1987) found that 7.7% of men in college in a nationally representative sample admitted to attempted or completed rape since age 14. Additionally, 7.2% reported sexual coercion since age 14. They found a six month incidence rate of 34 per 1,000 men of unwanted oral, anal, and vaginal intercourse attempts and completions. The questionnaires were administered anonymously and by self report.

White and Smith (2004) wrote about a five year longitudinal study with three incoming freshman classes of men (N=851) at a medium sized state university in the Southeastern United States. At the first time of questioning, 6.3% of the men admitted attempted or completed rape in adolescence going back to age 14. By the end of the study, 10.9% of the men admitted attempted or completed rape. As with similar studies the questions about adolescence were limited by their retrospective nature. For the most part, the college age studies are consistent in finding approximately 16-17% of male college student reported committing some type of sexual assault. The notable exception was Abbey and McAuslan's study which had a much higher rate of reported assault at Time 1, although a similar rate at Time 2. It is possible that this study found a higher rate due to differences in geographic location. This study was conducted in an urban setting versus the other studies which were conducted in more rural areas or in multiple types of locations.

Table 2.2: Summary of College Age Studies **(N=4)**

Author/Date	Region	Sample Size	Gender	Perpetrator %	Records or Self-Report
Abbey & McAuslan, 2004	Michigan	N=197	M	35% reported sexual assault (T1) 14.2% reported sexual assault (T2)	Self-Report (T1 retro to14) (T2 past 12 months)
Calhoun, et al., 1997	Madison County, GA	N=65	M	9.5% reported sexual coercion 6.4% reported rape	Self-Report
Koss, et al., 1987	Nation-wide	N=6,159	M	7.2% reported sexual coercion 7.7% reported attempted or completed rape	Self-Report (retro to 14)
White & Smith, 2004	Southeast	N=851	M	6.3% reported attempted or completed rape (T1) 10.9% reported attempted or completed rape (T2)	Self-Report(T1 retro to 14) (T2 at end of 4 year study)

Costs of Sexual Violence Victimization

Sexual violence victimization inflicts high mental health, medical, financial, educational, and social costs. Sexual victimization is associated with increased risk of mental health disorders (Boney-McCoy & Finkelhor, 1996), substance use and abuse problems (Fergusson, Boden, & Horwood, 2008), high risk sexual behaviors (Senn, Carey, Vanable, Coury-Doniger, & Urban, 2007), increased smoking (Fergusson et al., 2008), eating disorders (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004), and increased physical health problems (Campbell, Greeson, Bybee, & Raja, 2008).

Mental health & medical services costs. In 1993 Miller and colleagues estimated that rape and sexual assault cost $2,200 in mental health care per victim on a per crime basis. Mental health care for child sexual abuse costs $5,800 per victim on a per crime basis as measured by payments for services from mental health care professionals such as psychologists or social workers (Miller, Cohen, & Wiersema, 1996). Based on surveys of mental health care

professionals mental health care costs for survivors of sexual violence range from $273.5 to $617.7 million per year (in 1991 dollars) (M. A. Cohen & Miller, 1998). They are likely underestimates as it is believed that only 25 to 50% of victims seek mental health treatment (M. A. Cohen & Miller, 1998).

Studies show increased somatic complaints and use of medical services following sexual assault victimization among adult women (Kimerling & Calhoun, 1994; Koss, Koss, & Woodruff, 1991; Post, Mezey, Maxwell, & Wibert, 2002). The CDC estimated that 4.2% of hospital ER visits for assaults in 2001-2002 were related to sexual assault (Saltzman et al., 2007). As an example, medical care costs were estimated at $39,966,000 in 1996 for one state (Michigan). Miller and colleagues (1996) estimated $500 of costs in medical care per victim of rape or sexual assault; $490 per victim of child sexual abuse. Medical care included payment for hospital or physician care, medical devices, ambulance transport, allied health services, rehabilitation services, and prescriptions (Miller et al., 1996).

Loss of education, work productivity & income. Victims of sexual violence are less likely to finish high school, attend or complete college (Boden, Horwood, & Fergusson, 2007). One possible explanation is that violent victimization in adolescence leads to decreased commitment to and effort toward schoolwork, which in turn leads to decreased academic performance (MacMillan, 2000). In addition to educational difficulties, another study found that low income women with a history of childhood sexual abuse worked approximately 5% fewer months over a period of 33 months than women who do not report sexual abuse. Participants were 240% more likely to report mental health and 55% more likely to report their physical health as barriers to work (Lee & Tolman, 2006). MacMillan (2000) found that victims of sexual

assault in adolescence earned approximately $6,000 less per year as adults than non-victims when controlling for individual and socio-economic characteristics.

Psychosocial Costs of Sexual Victimization

Sexual victimization can lead to serious psychosocial costs. Studies linked sexual victimization to suicidal ideation and suicide attempts (Schneider, Cronkite, & Timko, 2008), alcohol and substance use and abuse problems (Schneider et al., 2008), and increased mental health and behavioral problems as compared to their non-abused peers (Hyman, 2000). Negative outcomes are apparent, regardless of age of victimization.

Childhood sexual abuse is linked with a variety of mental health and behavioral disorders among children, adolescents, and adults. Studies have found evidence of anxiety disorders in childhood and adulthood (Beitchman et al., 1992; Briere & Runtz, 1988; Chaffin, Silovsky, & Vaughn, 2005). Depression also is linked to childhood sexual abuse (Croysdale, Drerup, Bewsey, & Hoffmann, 2008; Fergusson et al., 2008; McCauley & Kern, 1997); as is alcohol and substance abuse and dependence (Chandy, Blum, & Resnick, 1997; Luster & Small, 1997). Suicidal ideation and suicide attempts are more likely among survivors of childhood sexual abuse (Chandy et al., 1997; Croysdale et al., 2008; Luster & Small, 1997).

Other mental health disorders and behavioral problems linked with childhood sexual abuse are conduct and anti-social personality disorder (Croysdale et al., 2008; Fergusson et al., 2008) and general delinquent behaviors such as stealing and running away (Feiring, Miller-Johnson, & Cleland, 2007; Kaufman & Widom, 1999). In addition child sexual abuse is linked to high risk sexual behaviors such as younger initiation of sexual activity, multiple sexual partners, unprotected sex, and prostitution and the results of these risky behaviors including sexually

transmitted diseases and pregnancy (Arriola, Louden, Doldren, & Fortenberry, 2005; Lemieux & Byers, 2008; Senn et al., 2007; Widom & Kuhns, 1996).

A small number of studies examining sexual violence in adolescent dating relationships have been done. Studies link sexual violence in adolescent dating relationships to high risk behaviors including heavy smoking, binge drinking, driving after drinking, cocaine use, intercourse prior to age 15, multiple sex partners, suicidal ideation and suicide attempts (Fergusson et al., 2008; Silverman et al., 2001; Wu, Berenson, & Wiemann, 2003). Although the negative outcomes from adolescent dating sexual violence appear similar to childhood sexual abuse further research is needed to better understand this issue.

Costs of Sexual Violence Perpetration

When perpetrators are caught, the incarceration and treatment of sexually violent youth also is costly. In 1993 estimated juvenile justice costs for all juvenile perpetrators of violence was $46 million, including treatment, probation, detention, and incarceration (Miller, Fisher, & Cohen, 2001). Cohen and Piquero (2009) estimated costs of various juvenile perpetrated crimes, including victim costs, criminal justice costs, and lost offender productivity due to incarceration. The cost of rape, after controlling for the probability of detecting and punishing the perpetrator, was $150,000; $135,000 in victim costs, $8,300 in criminal justice costs, and $4,500 in lost offender productivity. Criminal justice costs may appear low because the authors factored in the likelihood that perpetrators will be tried, convicted and sentenced and whether they will be sentenced to probation or jail time.

Etiology Studies

Theory of sexual offending is an underdeveloped area. There are a small number of etiology studies that examined factors that were associated with the development of sexual

violence among adolescents. These studies have limitations, mainly small sample size and the fact that they are based entirely on the sexual offender population, meaning we have no idea whether such etiological theories are useful for discriminating between youth who will or will not offend. They are reviewed here, however, as they may provide guidance as to which factors may be most important to understand the development of sexual violence.

Kobayashi *et al.* (1995) used structural equation modeling (SEM) to test an etiological model of youth sexual violence. The study had a sample of 117 charged or convicted sexually violent male adolescents, ages 12 to 19 referred to the Sexual Behavior Clinic, an outpatient evaluation and treatment center for sex offenders in New York City. The study model was based on social learning theory (Bandura, 1976), hypothesizing that the adolescent's perceived parental deviance, physical and sexual abuse history, bonding to parents will predict his level of deviant sexual aggression while controlling for age and race.

The study found that higher perceived parental deviance increased the adolescent's risk of physical abuse by people other than the parents and sexual abuse by females. Physical abuse by the father and sexual abuse by males increased the risk of higher levels of deviant sexual aggression. However, perceived parental deviance did not directly or indirectly contribute to the adolescent's level of deviant sexual aggression. The authors noted that the study was limited by the exclusive reliance of self-report by the adolescents. It is possible that this led to inadequate or inaccurate measurement of parental deviance (Kobayashi et al., 1995). Also, this study is limited by the relatively small sample size. SEM analyses benefit from a sample size of at least 200 (Bollen & Long, 1992).

Using a sample of 122 convicted juvenile sex offenders aged 18 or younger from five treatment centers in Virginia and Minnesota, Johnson and Knight (2000) used structural equation

modeling to test an etiological model of sexual coercion in juvenile sex offenders. They based their model on previous work by Malamuth and colleagues (1991) of antecedents of sexual coercion in college age males. Johnson and Knight found that childhood sexual abuse, adolescent alcohol abuse, and misogynistic fantasies all directly influenced the development of sexual coercion. There were indirect effects on sexual coercion via sexual compulsivity, misogynistic fantasies, peer aggression, hyper masculinity, and alcohol abuse. Only school disruption had neither direct nor indirect effects on sexual coercion. The overall model explained 33% of the variance in sexually coercive behavior (Johnson & Knight, 2000). This study is again limited by the relatively small sample size. SEM analyses benefit from a sample size of at least 200 (Bollen & Long, 1992).

Knight and Sims-Knight (2003) tested a model of developmental antecedents of sexually coercive behavior toward women and girls on a sample of 218 adjudicated sexual offenders in inpatient treatment facilities in Maine, Massachusetts, Minnesota, and Virginia. They found that both physical and sexual abuse had indirect effects on the development of sexually coercive behavior. Physical abuse had indirect effects through antisocial behavior and aggression and through callous/unemotional and aggressive sexual fantasy. Additionally, sexual fantasy had indirect effects on sexual coercion through aggressive sexual fantasy. There was also a direct effect from sexual abuse to sexual coercion and a direct effect from antisocial behavior/aggression to sexual coercion. Based on these three etiology studies sexual violence in adolescents appears related to a history of childhood abuse and adolescent behavioral issues (e.g., alcohol abuse and anti-social behaviors), along with sexually aggressive fantasy and attitudes.

Theoretical framework for the present study. Drawing on the literature reviewed above, an ecological-transactional model was used to organize the risk and protective factors suggested by the literature on sexually violent youth into a coherent framework for analysis. The ecological-transactional model posits that a child's development and ability to adapt to his or her circumstances are influenced on multiple nested levels with varying levels of proximity to the child. Risks at any level of the model, macrosystem, exosystem, microsystem or ontogenic development, can negatively effect healthy child development (Cicchetti & Lynch, 1993; Lynch & Cicchetti, 1998). The macrosystem corresponds to the cultural mores and values in a community or family, the exosystem is made up of the community within which the child lives, and the microsystem the family environment, and ontogenic development is the individual themselves. All levels of the model should be examined in research in order to develop the best understanding of the effects of individual, family, and environmental circumstances on a child (Cicchetti & Toth, 2009). The ecological-transactional model has not been applied to sexually violent youth in prior research, however it has been used with samples of adolescents with other physically violent and sexually risky behaviors (Henrich, Brookmeyer, Shrier, & Shahar, 2006; Matjasko, Needham, Grunden, & Farb, 2010).

Risk and Protective Factors

Developing effective prevention and intervention programs for sexually violent youth requires an understanding of the risk and protective factors associated with this issue. The literature that examines risk and protective factors and characteristics associated with sexual violence among youth can provide insight into factors to be examined. However, there are very few studies that examine risk and protective factors among general population youth. Also, there is a lack of information about possible differences between incarcerated or in-treatment

populations of sexually violent youth and those whose sexually violent behavior is only know through self-report on a survey. In order to develop a better understanding of risk and protective factors that may apply to general population youth, factors relevant to known sexually violent youth from clinical or incarcerated samples must also be considered.

Individual Factors

Mental health disorders. Sexually violent youth appear to have similar mental health issues as non-sexual delinquents. Studies find no significant differences in anxiety, depression, posttraumatic stress disorder (PTSD), psychopathy, and psychiatric hospitalizations between sexual and non-sexual delinquents (Awad, Saunders, & Levene, 1984; Jacobs, Kennedy, & Meyer, 1997; Spaccarelli, Bowden, Coatsworth, & Kim, 1997). These findings were based on incarcerated populations. In an exploratory study examining possible relationships between psychiatric disorders, juvenile delinquents, and offense characteristics van Wiljk and colleagues (2007) found that in a large sample including violent sex offenders (n=308), non-violent sex offenders (n=134), child molesters (n=270), violent non-sexual offenders (n=3,148), and non-violent non-sexual offenders (n=1,620) that non-violent sexual offenders and child molesters were more likely to have developmental disorders. This may indicate that the social skills deficits that are often associated with juvenile sexual offenders could be biologically based developmental delays (van Wijk, Blokland, Duits, Vermeiren, & Harkink, 2007). Based on this small number of studies it appears there may be little difference in mental health disorders between sexual and non-sexual offenders, however, we lack information about mental health disorders among sexually violent youth in the general population. Moreover, there is some indication from van Wijk's study that juvenile sexual offenders may have higher risk of developmental disorders. This needs to be examined also among general population youth.

Substance abuse disorders. There are few studies that examine alcohol and drug abuse among sexually violent youth. The limited information available indicates that non-sexual delinquents are more likely to have problems with alcohol and drugs than juvenile sexual offenders. In one study non-sexual delinquents (39%) were more likely to have problems with alcohol abuse than sexual assaulters (12%). They were also more likely to have problems with drug abuse, although this difference was not statically significant (42% vs. 18%, $p<.06$) (Awad & Saunders, 1991). Other studies have found similar results (Fagan & Wexler, 1988; van Wijk et al., 2005, 2007). These studies appear to have consistent findings; however, they used incarcerated only samples. Research using non-incarcerated, general population sexually violent youth is needed to better understand the relationship between alcohol and drug abuse and sexual violence.

Academic issues. Awad and Saunders (1991) found that juvenile sexual assaulters had significantly lower full-scale and performance IQ scores than non-sexual delinquents, but no other academic differences. In contrast, a study using the Pittsburgh Youth Study data found juvenile sexual offenders, along with their parents and teachers, reported low academic achievement more often than violent non-sexual offenders (van Wijk et al., 2005). However, other studies have found no differences in reading, math, spelling achievement, and full-scale IQ between juvenile sexual offenders and non-sexual juvenile delinquents (Caputo, Frick, & Brodsky, 1999; Jacobs et al., 1997; Lewis, Shanok, & Pincus, 1981; Tarter, Hegedus, Alterman, & Katz-Garris, 1983). Van Wijk's (2005) study compared sexually violent delinquents to other violent delinquents, therefore the results of this study may carry more weight than other studies that compare delinquents who commit crimes with differing levels of personal violence.

However, further research is needed to better understand possible learning and academic differences between sexually violent youth and other types of delinquents.

Social skills. With only two studies providing information on social skills among sexually violent youth, there is limited information available to guide intervention in this area. However, the available studies were consistent in their findings, indicating that all types of juvenile delinquents—sexual and non-sexual—had worse social skills than non-delinquent youth. In a study of 115 male adolescents Ronis and Borduin (2007) found that sexual offenders and non-sexual offenders were both significantly different from non-offenders on measures of emotional bonding (lower) and aggression with peers (higher) based on teacher and parent reports using the Missouri Peer Relations Inventory (MPRI). However, the sexual offending group and non-sexual offending group did not significantly differ from each other (Ronis & Borduin, 2007). One other study had similar findings (Michelson & Wood, 1982).

Maltreatment history. Spaccarelli and colleagues (1997) found among a group of 210 incarcerated adolescents that the sexual offenders were significantly more likely to have been seriously physically abused (43.6%) than a comparison group of lower violence, non-sexual offenders (20.8%); however, there were no differences between the sexual offenders and the group of higher violence non-sexual offenders. Another study found no differences in physical abuse among different types offenders (Jonson-Reid & Way, 2001). Differences in findings between these two studies may stem from differences in the measurement of physical abuse. Spaccarelli's study measured physical abuse by self report while Johnson-Reid and Way measured using reports in public records. In a more recent study, Burton (2008) found that incarcerated juvenile sexual offenders (N=127) were less likely to have been physically neglected than non-sexual offenders.

It is unclear whether there are significant differences in sexual victimization rates between sexual and non-sexual delinquents due to differences in the samples used in the few studies examining this issue. Ford and Linney (1995) found no differences in sexual victimization between peer sexual and non-sexual offenders, but did find that those who had molested children were more likely to have been sexually abused. Burton (2008) found that juvenile sexual offenders were significantly more likely to report sexual abuse on the Child Trauma Questionnaire Sexual Abuse scale (69.6%) than non-sexual offenders (39.6%) incarcerated in a residential facility. However, the sample in this study was not analyzed by offense type. It is possible that if the child molesters were analyzed separately from the other sexual offenders, Burton may have found similar results to Ford and Linney (Beckett, 1999).

The two studies that examined this issue among general population adolescents, found that those who had been sexually abused were significantly more likely to engage in sexually violent behaviors (Banyard et al., 2006; Lodico, Gruber, & DiClemente, 1996). Lodico, Gruber and DiClemente found that male adolescents in Minnesota who reported being sexually abused as children were significantly more likely to report coercive sexual behaviors (13.4%) than those who had not been abused (3%). Males who were sexually abused are 4.4 times more likely to coerce sex. Banyard and colleagues (2006) used data collected from 980 7-12th grade students across Wisconsin. Ten percent of males reported perpetrating sexual coercion. Those who had been sexually abused were 21 times more likely to report being sexually coercive (Banyard et al., 2006).

Sexual knowledge and experiences. Awad et al. (1984) found that similar numbers of juvenile sexual offenders and non-sexual offenders—about one third—reported having consensual sex with a peer. In more concerning findings, another study found that juvenile sex

offenders are exposed to sexually explicit materials such as pornography at significantly younger ages than other types of juvenile delinquents (Ford & Linney, 1995). However, there is little information available about the nature of the exposure, especially whether it was part of abusive experiences with adults, or sought out by the adolescents on their own. Research is needed to understand the possible impact of exposure to sexually explicit materials and other sexual experiences at an early age on sexual violence.

Self-esteem. Ford and Linney (1995) found no significant differences between incarcerated juvenile sexual offenders, violent non-sexual delinquents, and status offenders on any of the sub scales of the Piers-Harris Children's Self-Concept Scale (PHCSC) (Piers, 1984) which included displays of problematic behavior, attitudes toward their physical appearance, dysphoric mood and anxiety, and popularity with peers.

Family Factors

Among the studies that examined family factors, there were those that examine family characteristics, others that examined measures of functioning, and disciple. All the family studies compared sexually violent youth to other types of delinquent youth which is helpful in differentiating factors that may be related to delinquency in general versus those related specifically to sexual delinquency. However, it is difficult to compare results across studies because studies testing the same constructs often did not use the same measures.

Characteristics. Similar to socio-economic status, studies examining other family characteristics found mixed evidence on whether certain characteristics differentiate sexually violent youth from other types of delinquent youth. Awad et al. (1984) found no differences in terms of family instability or parent-child separations due to divorce between juvenile sexual offenders and other types of delinquents. In contrast, Fagan and Wexler (1988) found that

juvenile sex offenders were far more likely to live with both birth parents (over 50%) than violent non-sex offenders (18%). Banyard and colleagues (2006) found that while parental divorce was positively associated with perpetrating sexual assault on the bivariate level, when controlling for other factors including history of sexual abuse, depression, and substance abuse, parental divorce did not retain significance.

Socio-economic status. Awad et al. (1984) found that juvenile sexual offenders were equally as likely to come from a middle class (54%) as a lower class (51%) background, based on their parent's education, occupation, and income. The non-sexual delinquents in the comparison group were more likely to come from lower class backgrounds (75%) rather than the middle class (25%). In contrast another study found that juvenile sexual offenders were more likely to have poor housing, based on interviewer report of structural problems, even in better neighborhoods, and to have a younger and worse educated mother than violent non-sexual offenders in the comparison group (van Wijk et al., 2005). It is possible that the different outcomes of these two studies stemmed from differences in how the groups were split.

Functioning. Several studies examining family cohesion and environment found few significant differences between sexual and non-sexual juvenile delinquents (Bischof, Stith, & Wilson, 1992; Bischof & Stith, 1995; Ronis & Borduin, 2007). However, Bischof and colleagues (1992) did find significant differences in perceptions of cohesion. Adolescent sexual offenders perceived their families as being more emotionally bonded than the non-sexual delinquents did.

The studies examining family functioning were, for the most part, consistent in their finding little difference between sexually violent youth and other delinquents. However, the studies examined different facets of family functioning and used different measures to assess the functioning levels. Research examining family relationships and functioning among sexually

violent youth is needed. Comparisons between sexual and non-sexual delinquents are needed to clarify whether family difficulties contribute differentially to the development of sexual violence versus general delinquent behavior

Peer Factors

There is limited research on association between delinquent peers and sexually violent behaviors. However, the literature indicates that there may be a relationship between spending time with delinquent peers and perpetrating sexual violence. Additionally research indicates that delinquent peers are an indicator of delinquent behavior and that different types of delinquent youth have similar peer relationships (Haynie & Osgood, 2005; Haynie & Payne, 2006).

Delinquent peers. Multiple studies have found that sexual and non-sexual delinquents tend to be socially isolated and have limited social skills compared to non-delinquent youth (Awad & Saunders, 1991; Awad et al., 1984; Ford & Linney, 1995). Additionally a study of 115 male adolescents divided into five demographically matched groups found that sexual offenders and non-sexual offenders did not significantly differ on measures of emotional bonding and aggression with peers based on teacher and parent reports using the Missouri Peer Relations Inventory (MPRI) (Ronis & Borduin, 2007). Ageton (1983) found that spending time with delinquent peers was a strong predictor of sexual violent perpetration among adolescent males. This study examined self reports about friendships to better understand whether delinquent peers predicts rape differentially from other types of violent delinquency.

Community factors

Neighborhood conditions. There is very little research available on youth sexual violence and possible neighborhood factors. One study reported that juvenile sexual offenders

were more likely to live in a bad neighborhood, based on census derived data on median income, unemployment, poverty, age of residents, female headed households; and to live in worse housing based on interviewer perception of structural problems, regardless of quality of neighborhood, than violent non-sexual offenders (van Wijk et al., 2005).

Conclusion

Youth sexual violence is a serious social problem. Thousands are victimized each year, costing hundreds of thousands of dollars annually to individuals and the public in medical and mental health care, loss of work and education productivity, incarceration, and other psycho-social costs. It appears that sexual violence is perpetrated by a relatively small percentage of the overall population, but at a high cost to all. In addition to a serious need for a better knowledge about the rate of sexual violence perpetration among general population youth, a better understanding of the risk and protective factors associated with sexual violence perpetration is needed.

The studies that examined risk and protective factors of sexual violence perpetration largely used incarcerated or clinical samples. Research using a general population sample is needed to gain a better understanding of risk and protective factors among general population males in order to better prevent and intervene in this issue. Additionally, this study examined individual, family, peer and community risk and protective factors in one model which has not been done to date. Examining risk and protective factors in one model offers a better understanding of how these factors may differentially contribute to the development of sexual violence.

Young Adult Outcomes

Very little is known about the young adult outcomes of sexually violent youth. There are intervention studies with long follow up periods that have followed these youth into the young adult years, but these studies were focused on treatment and recidivism. We lack evidence to suggest that all youth go on to be adult offenders or what other areas of their adult lives may look like. Sexual recidivism rates are significantly higher in the adolescent years than the adult years, 9.9% versus 6.5% (Caldwell, 2010). Basing intervention, therefore, on the assumption that we are merely preventing adult sexual offending may not be a useful approach.

There are very few studies that compare adolescent and adult perpetrators of sexual violence. The few studies that exist offer no evidence to suggest that risk factors for adolescent sexual violence and adult sexual violence differ significantly. These studies have found that risk factors and offense characteristics were similar, at least among incarcerated populations (Aylwin et al., 2000). Additionally, a recent review and meta-analysis of risk factors for perpetrating child sexual abuse found similar characteristics for adults as found in the literature on adolescents (Whitaker et al., 2008).

The evidence from recidivism studies with sexually violent youth indicates that treatment is an effective means of reducing sexual recidivism rates with overall recidivism rates of 7.4% for those receiving treatment compared to 18.9% for those not treated with an average 59 month follow up period (Reitzel & Carbonell, 2006). The only outcomes that were examined in these studies are sexual and other criminal recidivism. There are no studies that examine other young adult indicators of life success and failure such as graduating high school, attending college, working full-time, partnering in a stable romantic cohabiting relationship, and not getting arrested. Data about young adult outcomes in addition to criminal and sexual recidivism provide

additional evidence about how sexually violent youth function in society as young adults. Do they continue to be troubled and to cause harm to others? Or do they become more productive members of society? Are there factors in adolescence that help us understand whether or not their adult development is more positive?

This study addressed two serious gaps in the literature related to rape perpetration among adolescent males. First, a national general population dataset was used to understand rape perpetration outside the context of incarcerated populations and to provide nationally representative results. Second, the study examined later young adult transitions without using the lens of the adult sex offender. In other words, no assumption was made regarding continued offending as compared to other key adult outcomes. While the adult literature suggests that 35% may have begun offending earlier (Longo & Groth, 1983), this is not the same as asking what happens to all the youth who report this behavior.

This study used data from the National Longitudinal Study of Adolescent Health (Add Health) to answer questions about rape among general population youth. Add Health is a large, nationally representative, general population study that includes questions about rape perpetration, violent and non-violent delinquency and a broad range of individual, family, peer, and community characteristics and qualities. Although not without limitations, which will be addressed in later chapters, Add Health is an excellent data set with the necessary variables available to answer the research questions posed in this study and to address some of the methodological limitations in prior studies such as samples consisting only of incarcerated or clinical populations or very small sample sizes. In particular, the Add Health data set is well suited for analyses comparing groups of youth with different types of delinquent behaviors and examining young adult outcomes; both underdeveloped areas of research.

Chapter 3

Methodology and Research Design

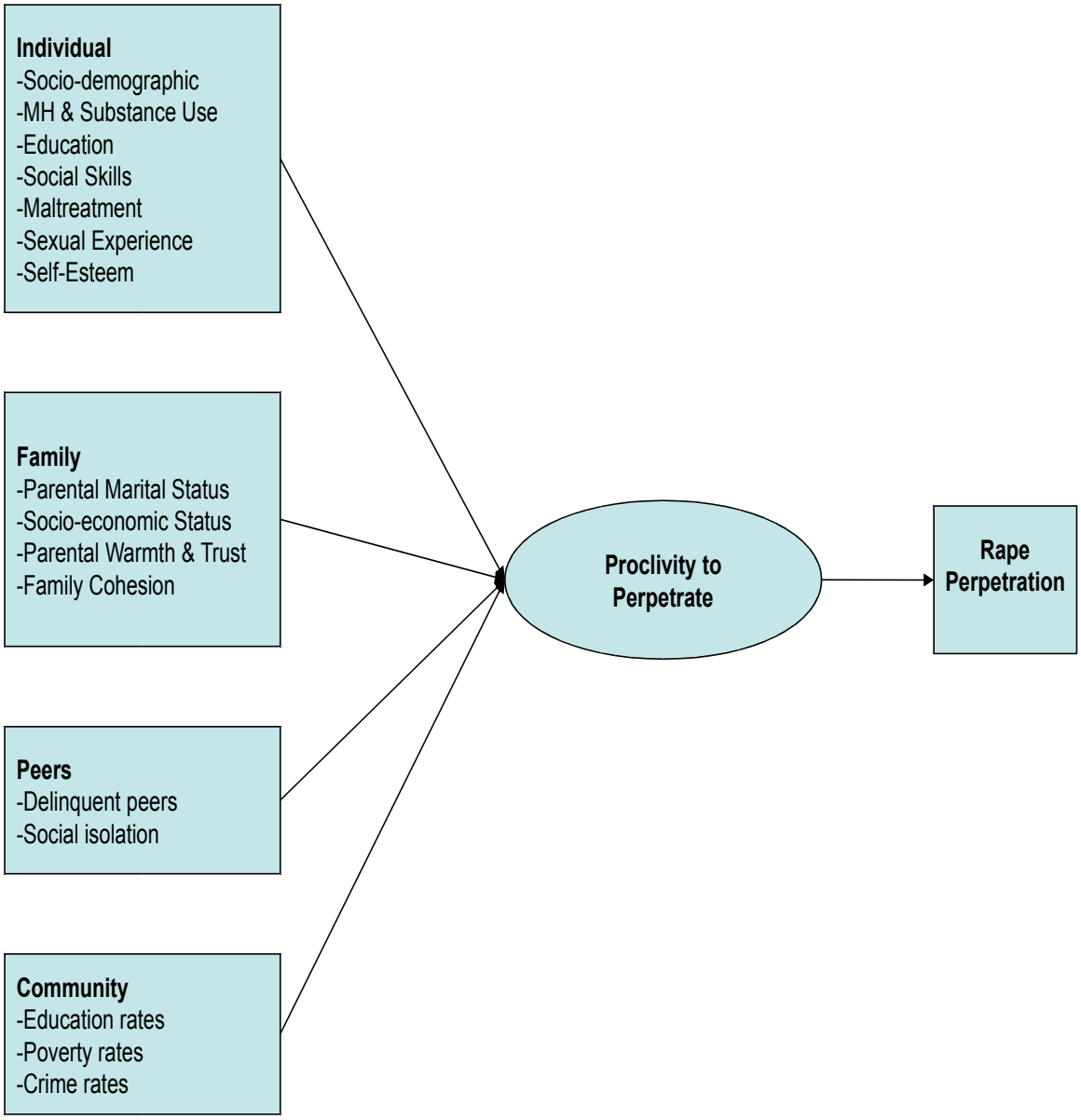
This study examined the risk and protective factors for sexually active adolescent males to perpetrate rape (physically forced sexual intercourse) against women. Whether these risk and protective factors also can predict violent and non-violent delinquent behaviors was tested. An ecological-transactional framework guided the conceptual design of the study. Logistic regression was used to examine these factors for youth interviewed for The National Longitudinal Study of Adolescent Health (Add Health). Multinomial logistic regression was used to compare the three delinquent groups (sexually violent, violent, and non-violent) and non-delinquent youth. Additionally, binary logistic regression was used to better understand young adult outcomes for youth who perpetrate rape.

Conceptual Model

The literature presented in the previous chapter provided a framework for understanding the concepts included in the analyses. Together, the aims and supporting literature illustrated a relationship between key variables in the study of youth who perpetrate rape. A conceptual model illustrating these relationships is graphically represented in Figure 3.1. The conceptual model for this study incorporated identified risk and protective factors from the literature using an ecological-transactional framework to organize factors into individual, family, peer, and community factors, depicted in the boxes on the left. The oval in the middle represents the latent variable proclivity to perpetrate rape. The arrows from all boxes on the right point to the latent variable to demonstrate that all risk and protective factors may influence the possibility of perpetrating rape. The box on the right depicts the outcome of interest, rape perpetration to which all risk and protective factors point, through the latent variable proclivity to perpetrate. While

these factors were identified from prior studies, no study has ever tested them in one model or compared the relative contribution of various factors in predicting rape perpetration among adolescent males.

Figure 3.1: Conceptual Model



Research Design and Methods

The data for this study came from The National Longitudinal Study of Adolescent Health (Add Health), which surveyed a nationally representative sample of adolescents who were in seventh through twelfth grades in the 1994-1995 academic year. This cohort was followed into young adulthood with four in-home interviews. The final interview was conducted in 2008. The data consists of in school interviews, in-home interviews, school administrator questionnaires, parent questionnaires, and partner questionnaires (Harris et al., 2010). The present study limited the sample to sexually active, male youth.

Overview of Add Health

Add Health data were collected over four unequally spaced waves in 1994-1995, 1996, 2001-2002, and 2007-2008. A sample of 80 high schools and 52 junior high and middle schools for a total of 132 schools in the US was selected with unequal probability of selection. The middle schools were selected on the basis of being "feeder" schools to the high schools. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample was representative of U.S. schools with respect to region of country, urbanicity, school size, school type, and ethnicity. The 80 high schools sampled in Wave I were systematically selected with probability proportional to enrollment size from a sampling frame of 26,666 schools sorted by size, school type, census region, level of urbanization, and percent of white students. Of the original 80 schools, 52 were eligible and agreed to participate. The remaining 28 were replaced by similar high schools. They were matched to the original schools based on the original five sorting criteria and an additional three criteria that included grade span, percent black, and census division (Harris et al., 2010). See Table 3.1 for more details on regions, numbers and types of schools, and grades within schools.

Table 3.1: Participating High Schools (Harris, et al., 2009)

Participating High Schools Region	Number of Schools in each Region	Grade Span	Number of Schools within each Grade Span
Northeast	17	K-12	7
South	27	7-12	10
Midwest	19	9-12	49
West	17	10-12	7
School Type	Number of each School Type	Metropolitan Status	Number of Schools in Metropolitan Status
Public	71	Urban	24
Catholic	3	Suburban	42
Other Private	6	Rural	14

In Wave I (1994-1995) both in-school and in-home interviews were conducted. Over 90,000 students in grades 7-12 and 172 school administrators were interviewed. All students present on the interview day at their particular school, whose parents had not opted out of participation for the student, were given a questionnaire to complete. Among the students, 20,745 were selected for in-home interviews. These participants constituted the base sample for follow up in later waves. Over 17,000 parents also were interviewed in their homes (Harris et al., 2010). Parents were not interviewed in subsequent waves. Wave III was conducted in 2001-2002. Over 15,000 young adults, ages 18-26, were interviewed at home. Additionally, 1,507 of their romantic partners were interviewed. Only heterosexual couples were included in the partner interviews.

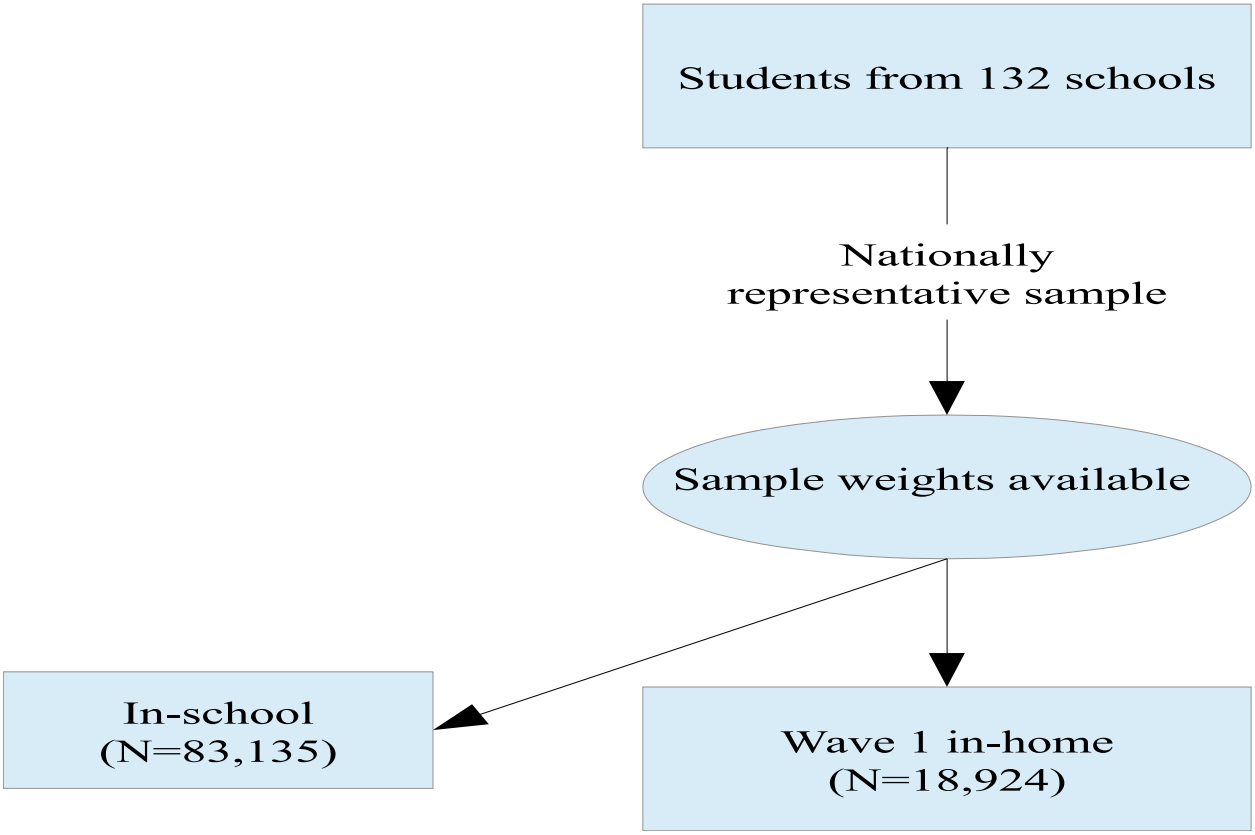
Design

The selection process for Add Health was designed to provide a nationally representative sample of adolescents and for specialized genetic analyses. The genetic sample included students from the original 132 schools in the sampling frame and students from alternative schools selected in order to increase the size of the genetic sample. The respondents that were part of the

oversampling groups do not have weight variables available for use in analysis. In order to obtain analysis results that can be considered nationally representative, weight variables must be used in the analysis (Chantala & Tabor, 2010).

Figure 3.2 is a graphic depiction of this information. For this analysis, data from the Wave 1 in-home interviews was used because it contained all the variables of interest to examine the research questions. The in-school interviews, although given to a much larger group of respondents, contained far less data and a very limited number of the variables of interest.

Figure 3.2: Illustration of Add Health Survey Design



In order to properly address the complex sampling design of the Add Health data set, strata, cluster, and weight variables must be used during analyses (Chantala, 2006). Due to unequal probability of selection, the school became the cluster identifier, or primary sampling

unit. The 80 schools in the sample were chosen from a sampling frame of 26,666 schools with an unequal probability of selection. Prior to sampling schools were sorted based on size, school type, census regions, level of urbanization, and percent white. Of the 80 schools chosen, 52 were eligible and chose to participate. A school was eligible if it had an 11th grade and at least 30 students enrolled. The 28 schools that did participate were replaced with similar schools. Replacement schools were chosen by sorting the sampling frame by school size, school type, level of urbanicity, percent white, grade span, percent black, census region, and census division. After sorting sampling frame, schools were sorted in random order within each category and replacement school was the school that followed the original sample school on the sorted file (Udry, Bearman, & Mullan Harris, n.d.). The original Add Health sampling plan did not include stratification, however, a post-stratification adjustment was made to sample weights so that region of country (the strata variable) could be used as a post-stratification variable. For each region (Northeast, Midwest, South, and West) adjustments were made to the initial school weights so that the sum of the school weights was equal to the total number of schools in the sampling frame (Chantala & Tabor, 2010).

Because the question about perpetrating rape was asked only of male youth who reported having been sexually active, the sample for the present study was limited to self-reported sexually active males (N=3,854). Sexually active females in the study were asked only about rape victimization. Respondents who did not endorse being sexually active were not asked questions about rape for either gender. In Wave 1, 141 (3.8%) of the sexually active males reported perpetrating rape. SAS 9.3, used for the analysis, allows for subpopulation analysis using a DOMAIN statement. Use of the DOMAIN statement keeps the proper number of strata and clusters in the analysis while allowing for examination of the specific population of interest

(Chantala, 2006; "The SURVEYLOGISTIC Procedure," 2011). Tables 3.2 through 3.7 list the variables, indicate the available measures in the Add Health data, the number of items measured, and the Wave in which the item is measured.

Individual characteristics. Socio-demographic variables included age and race. Age was a continuous variable measured by subtracting date of birth from date of interview. Race was categorical and included three groups: White, Black and Other. Other included Asians, Native Americans, and bi-racial youth. Latino youth were included in their respective racial groups rather than by ethnicity. Other individual factors included depression which was measured by a slightly modified version of The Center for Epidemiological Studies Depression (CES-D) (Radloff, 1977) screening questionnaire. The questions used for Add Health were 19 of the 20 original questions (a question about restless sleep was not used by Add Health researchers) summed and split into a three level ordinal variable (no depression, mild to moderate depression, and severe depression); substance abuse which measures alcohol and marijuana use over the past one year and was divided by frequency of use (never, once a month or less, and once a week or more); education which included the dichotomous variables of ever failing a class, receiving special education services, and ever being suspended or expelled and a continuous variable measuring perceived teacher support; social skills which included a dichotomous measure of aggression toward peers and a continuous measure of feelings of social belonging using questions developed by Bollen and Hoyle (1990); maltreatment history which included three dichotomous variables measured retrospectively in Wave 3 by asking for recollections about abusive parental behavior prior to age 12; sexual experience history which included numbers of sexual partners which was split into a three category ordinal variable of one, two to three, and four or more, dichotomous measures of sexually transmitted infection and ever having

exchanged sex for drugs or money; and a continuous measure of self-esteem (Table 3.2 includes reporting source for each variable).

Table 3.2: Individual Level Variables and Measures

Variable	How Measured in Add Health	# of Items	Wave
Age	Calculated by subtracting date of birth from date of interview	1	I
Race	Self report	1	I
Depression	Self report	19	I
Substance Abuse	Self report	4	I
Education	Self report Parent report	2	I
Social Skills	Self report	1	I
Maltreatment history	Self report (retrospective from Wave III)	4	III
Sexual Experiences	Self report	3	I
Self-esteem	Self report	11	I

Family characteristics. Parental marital status was a dichotomous variable grouping unmarried and divorced together. Socio-economic status (SES) was measured by family use of AFCD or TANF and interviewer perception of house quality which was a four level ordinal variable ranging from very well kept to very poorly kept. Two continuous measures, parental trust and warmth and family connectedness were also used in analyses. Parental trust and warmth was created from five questions asked of parents about feelings toward their child, quality of the relationship, and trust for the child. Family connectedness was created from questions asked of the respondent (child) regarding feelings of connection and belonging to the family (Table 3.3 includes reporting source for each variable).

Table 3.3: Family Level Variables and Measures

Variable	How Measured in Add Health	# of Items	Wave
Marital Status	Parent report	1	I
SES	Parent report	1	I
House Quality	Interviewer report	1	I
Parental Trust & Warmth	Parent report	5	I
Family Connectedness	Self report	5	I

Peer level variables. Delinquent peers was a continuous variable measured by three items that ask about numbers of closest friends who regularly participate in certain delinquent behaviors which include drinking, smoking, and marijuana use. Respondents could report from zero to three friends who participated in each of these behaviors, for a possible total of up to nine friends with delinquent behaviors. Social isolation was measured dichotomously based on the respondent's report of having at least one friend or no friends at all (Table 3.4 includes reporting source for each variable).

Table 3.4: Peer Level Variables, Measures, and Sources

Variable	How Measured in Add Health	# of Items	Wave
Delinquent peers	Self report	3	I
Social isolation	Self report	1	I

Community level variables. All community variables were measured by 1990 U.S. Census data at the county level. Community poverty rates were measured by number of people living below the 1989 federal poverty level of income. High school graduation rate was the number of persons with high school degrees or the equivalent per 100,000 of population in the given county. Adult and juvenile violent crime arrest rates were continuously measured by

numbers of people arrested per 100,000 of population in the given county. (Table 3.5 includes reporting source for each variable).

Table 3.5: Community Level Variables and Measures

Variable	How Measured In Add Health	# of Items	Wave
Poverty	US Census data	1	I
High school graduates	US Census data	1	I
Adult arrest	US Census data	1	I
Juvenile arrest	US Census data	1	I

Young adult outcomes. High school graduation was dichotomously measured by the respondent's self report of level of schooling they had completed. Full time work or schooling was dichotomized into a yes/no variable that was created from two variables that reported whether the respondent attended school full time or had a full time job (military service was included as full time work). Arrest was dichotomously measured by single question as to whether the respondent has been arrested since age 18. Stable romantic cohabiting was measured by two questions that asked about numbers of marriages and marriage-like relationships and was presented as a three level ordinal variable split into no such relationships, one relationship, and two or more relationships. Interpersonal violence was measured by physical abuse in romantic relationships and forced sex. These questions were only asked about partners in heterosexual relationships. A single question (e.g., have you ever forced [NAME OF ROMANTIC PARTNER] to do something sexual that she did not want to do?) was asked up to 41 times about each opposite gender romantic partner named by the respondent. A dichotomous variable was created by including those who responded yes at least once in one category and those who

answered no each time in the other. The physical abuse variable was created in the same manner. (Table 3.6 includes reporting source for each variable).

Table 3.6: Young Adult Outcome Variables and Measures

Variable	How Measured In Add Health	# of Items	Wave
High school graduate	Self report	1	III
Full time work/school	Self report	2	III
Arrest	Self report	1	III
Stable partnering	Self report	2	III
Physical IPV	Self report	41	III
Sexual IPV	Self report	41	III

Sample

For Aim 1 the sample consisted of sexually active males, ages 18 and younger, interviewed at home and school for Wave 1 (n=3,854). All males included in Waves I of the study were in the 12th grade or below at the time of the interviews. There were up to four groups included in the analysis. The primary groups of interest was the sexually violent group which included participants who answered "Yes" to the Wave 1 question "Did you ever physically force someone to have sexual intercourse against her will?" These questions were worded in such a way that the sexual violence measured specifically was physically forced, male upon female, penetrative rape.

The second group was non-sexually violent delinquent youth who reported three or more times in the previous 12 months the following: 1) How often did you get into a serious physical fight?, 2) How often did you hurt someone badly enough to need bandages or care from a doctor or nurse?, 3) How often did you use or threaten to use a weapon to get something from someone?, 4) How often did you take part in a fight where a group of your friends was against

another group?, and 5) How often have you shot or stabbed someone?. The third group was non-sexual, non-violent delinquent youth who reported three or more times in the previous 12 months the following: 1) How often did you deliberately damage property that didn't belong did you?, 2) How often did you drive a car without its owner's permission?, 3) How often did you steal something worth more than $50?, 4) How often did you go into a house or building to steal something?, and 5) How often did you sell marijuana or other drugs?. The fourth group was non-delinquent youth included all remaining sexually active male respondents in Wave I who did not endorse any of the delinquent behaviors. (Table 3.7 includes reporting source for each variable).

Table 3.7: Outcome Variables and Measures

Variable	How Measured in Add Health	# of Items	Wave
Rape Perpetration	Self report	1	I
Violent delinquency	Self report	5	I
Non-violent delinquency	Self report	5	I

The sample for Aim 2 consisted of the same group of youth who self reported perpetrating rape in Wave I who also participated in Wave III interviews (N=2,699). The latter wave consist of interviews of the subjects from age 18 through 26, who were no longer in high school. A large number of respondents (n=1,155) were lost to attrition between Wave I and Wave III. Respondents who participated in Wave III were more likely to be female, to be non-Black, and to have been in a lower grade in Wave I (Chantala, Kalsbeek, & Andraca, 2005). Wave III weight variables were calculated to adjust for the attrition between waves.

Analyses

Multiple imputation. Data was missing randomly in the data set at rates of 0 to 5 percent. IVEware: Imputation and Variance Estimation Software 2.0 was used for the multiple

imputation. IVEware was developed by researchers at the Survey Methodology Program, Survey Research Center, Institute for Social Research at the University of Michigan for the purpose of creating and analyzing imputed data sets (Raghunathan, Lepkowski, Van Hoewyk, & Solenberger, 2001). It is capable of handing the complex data structures that are typical in survey data such as large numbers of variables with various distributions, including continuous, binary, polytomous, counts and mixed. IVEware imputes data using the Sequential Regression Imputation Method which creates a sequence of regression models. Data is imputed by drawing values from posterior predictive distributions. Another key feature of IVEware is that it allows for bounding of imputed values (Raghunathan et al., 2001).

All the variables tested in the various models were used for the imputation model. Ten iterations were done for each of the ten imputations completed to create ten full and complete data sets. Those ten data sets were then exported back into SAS 9.3 for analysis. Only results from the subpopulation of sexually active males were reported in order to match the skip pattern set in the original data which only asked the question about perpetrating rape to sexually active males. The DOMAIN statement is used for subpopulation analysis in SAS 9.3 and is available for all the types of analysis conducted (PROC SURVEYFREQ, PROC SURVEYMEANS, and PROC SURVEYLOGISTIC).

Descriptive statistics. Descriptive statistics were computed for all of the examined variables, using frequencies or means, as appropriate. Additionally, the prevalence of perpetrating rape, violent and non-violent delinquent behavior among general population, sexually active, male adolescents was calculated.

Aim 1: To examine which individual, family, peer and neighborhood factors contribute to or protect from adolescent onset rape using a nationally representative general population sample of male adolescents.

Hypothesis 1a: Youth with a history of maltreatment will be more likely to perpetrate rape.

Hypothesis 1b: Youth with a history of aggression toward peers will be more likely to perpetrate rape.

Problematic multicollinearity was tested using the VIF and TOL statistics. Variables with a VIF greater than 2.5 or a TOL below .40 were eliminated from the analyses (Allison, 2012). Logistic regression analysis was used to test this aim. In order to appropriately accommodate the complex design of the Add Health data set, Proc Surveylogistic was used adding Strata, Cluster, and Weight to the analysis. Odds ratios were produced for each explanatory variable in the multivariate models. The efficacy of explanatory variables in the model was assessed with individual Wald tests of significance. Proc Mianalyze was used to combine the results of the logistic regression analyses from each of the ten data sets that were created in the multiple imputation process. Combined estimates, standard errors, Wald chi-square and *p* values were computed.

Multiple models were tested based on the discussed literature and theories. The first model tested consisted of a group of variables that were significant in both etiology studies and descriptive studies—physical abuse, sexual abuse, neglect, alcohol abuse, and aggression toward peers. Additional models consisted of individual variables (age, race mental health, substance use, education, social skills, maltreatment history, sexual experiences, and self esteem), family variables (parental marital status, socio-economic status, parental trust and warmth, and family

connectedness), peer variables (delinquent peers and social isolation), and community variables (community poverty, high school and college graduate rates, property and violent crime rates and juvenile and adult property and violent arrest rates). Then the final, ecologically based model was tested. Wave I data was used for this analysis. All models were developed using the following criteria, based on Gelman and Hill's (2007) recommendations:

1. included all explanatory variables that were substantively expected to be predictive,
2. tested for interactions among significant explanatory variables,
3. considered eliminating explanatory variables from the model which were not significant if the coefficient was in the "wrong" direction and considered retaining if it was in the expected direction.

Additionally, interaction testing was done for all models. Interactions were retained in models based on theoretical considerations and model fit.

Comparisons among delinquent groups. A proportional odds test was conducted to ascertain whether ordered logistic regression was appropriate. The results of the proportional odds test were significant indicating that multinomial logistic regression was the more appropriate analysis. Multinomial logistic regression was used to compare the final ecological model among violent delinquents, non-violent delinquents, and non-delinquents to rape perpetrating youth. This allowed for testing if the final ecological model also predicted inclusion in one or more of the other delinquent groups and which explanatory variables were or were not significant for each group as compared to the rape perpetrating youth. This addressed the question raised by the extant literature as to whether sexually violent youth can be differentiated from other types of delinquent youth.

Aim 2: To explore early adult indicators of success and/or failure—high school graduation, full time employment/school, stable romantic partnering, and arrest—for those who self-reported perpetrating rape in adolescence. There is no hypothesis for this Aim as there is no literature on later development of youth who perpetrate rape outside of incarcerated populations. Further, there is no literature that attempts to understand if there is a subset of these youth that appear to have more normative young adult outcomes.

Binary logistic regression analysis was used for this aim because there were too few youth who reported perpetrating rape to attempt multivariate models related to their outcomes. Waves I and III data was used to determine sample inclusion and Waves III data was used for the explanatory variables. The sample for Aim 2 analysis included males who were sexually active in Wave I (i.e., the same group analyzed in Aim 1) and had Wave III weight data available. The outcome variable of interest was rape perpetration in Wave I (a yes/no dichotomous variable). All explanatory variables, which included high school graduation, full-time work or school, arrest since age 19, stable romantic cohabiting, and physical and sexual interpersonal violence, were measured in Wave III.

Chapter 4

Results

Descriptive Statistics

The total sample for Wave 1 data of respondents with available weight data was 18,918, including males and females. It consisted of 50.9% male respondents and the mean age was 16.4 years. Racially, the total sample was 73.0% Caucasian, 15.8% African American, and 11.2% other ethnic and racial minorities (which included Asian, Native American, and bi-racial respondents). The subsample in this analysis were the 3,854 sexually active males in Wave 1; 39.1% of the males in the total sample. A total of 141 (3.8%) of respondents in this subsample reported physically forcing sexual intercourse with a female. Tables 4.1 to 4.4 has number of cases, weighted proportions and standard errors for all categorical explanatory variables from the conceptual model for this study. Means and standard errors were used for continuous variables. Table 4.1 has the individual characteristics of the sample. Table 4.2 has the family characteristics, Table 4.3 the peer characteristics, and Table 4.4 the community characteristics.

Table 4.1: Wave 1 Individual Characteristics Descriptive Statistics (N=3,854)

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Age	16.42	.037
Race		
White	2110 (64.5%)	.010
Black	1133 (25.0%)	.009
Other	611 (10.5%)	.011
Perpetrated Rape		
No	3713 (96.2%)	.004
Yes	141 (3.8%)	.004
Violent Delinquency		
No	2234 (56.0%)	.013

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Yes	1620 (44.0%)	.013
Non-Violent Delinquency		
No	2661 (69.1%)	.011
Yes	1193 (30.9%)	.011
Non-Delinquent		
No	1921 (49.8%)	.016
Yes	1933 (50.2%)	.016
Depression		
None	2942 (76.4%)	.010
Mild to Moderate	652 (16.5%)	.008
Severe	261 (7.1%)	.010
Marijuana Use		
None	2737 (69.8%)	.010
Once a month or less	225 (5.8%)	.005
Twice a month or more	892 (24.4%)	.011
Alcohol Use		
None	1347 (32.7%)	.010
Once a month or less	1186 (30.5%)	.010
About once a week or more	1321 (36.8%)	.013
Sexually Abused		
No	3630 (93.9%)	.007
Yes	224 (6.1%)	.007
Physically Abused		
No	2896 (75.4%)	.012
Yes	958 (24.6%)	.012
Neglected		
No	2862 (74.7%)	.011
Yes	992 (25.3%)	.011
Self-Esteem	11.09	.078
Social Belonging	7.46	.068

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Social Problems with Peers		
No	3159 (81.4%)	.009
Yes	695 (18.6%)	.009
Special Education Services		
No	3399 (86.5%)	.008
Yes	455 (13.5%)	.008
Ever Suspended or Expelled		
No	1702 (42.4%)	.011
Yes	2152 (57.6%)	.011
Ever Failed a Class		
No	2129 (56.6%)	.011
Yes	1725 (43.4%)	.011
Perceived Teacher Support	7.18	.040
Number of Sexual Partners		
One	1559 (40.5%)	.011
2-3	986 (25.9%)	.010
4 or more	1309 (33.6%)	.013
Sexually Transmitted Infection		
No	3716 (96.2%)	.004
Yes	138 (3.8%)	.004
Ever Exchanged Sex for Drugs/Money		
No	3736 (96.3%)	.004
Yes	118 (3.7%)	.004

Table 4.2: Wave 1 Family Characteristics Descriptive Statistics (N=3,854)

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Parent Marital Status		
Unmarried/Divorced	1408 (36.4%)	.011
Married	2446 (63.6%)	.011
AFCD/TANF		
No	3193 (81.5%)	.009
Yes	662 (18.5%)	.009
House Quality		
Very Well Kept	1845 (46.6%)	.011
Fairly Well Kept	1316 (32.6%)	.010
Poorly Kept	453 (13.3%)	.008
Very Poorly Kept	240 (7.5%)	.013
Parental Trust & Warmth	10.16	.071
Family Connectedness	19.00	.080

Table 4.3: Wave 1 Peer Characteristics Descriptive Statistics (N=3,854)

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Has a Friend		
No	230 (6.5%)	.005
Yes	3624 (93.5%)	.005
Friend's Delinquent Behaviors	4.10	.062

Table 4.4: Wave 1 Census Statistics for Sexually Active Males (N=3,854)

County Level Census Data	Rate per 100,000 of Population	SE
Community Poverty	0.15	.002
High School Graduates	0.26	.002
Adult Violent Arrest	233.74	3.274
Juvenile Violent Arrest	55.25	.888

Bivariate Analyses

Each explanatory variable included in the conceptual model for this study was regressed upon rape perpetration using binary logistic regression. Of the 32 variables examined in binary analysis only eleven demonstrated a significant relationship with the outcome variable of interest. Every one year increase in age (OR=1.347, CL=1.283-1.414), endorsing violent delinquency (OR=1.901, CL=1.26-2.878) or non-violent delinquency (OR=1.627, CL=1.035-2.557) was associated with a greater risk of rape perpetration, as was pot use twice a month or more (OR=1.885, CL=1.174-3.024) (non-use and less frequent pot use were not significant) and having been sexually abused in childhood (OR=3.354, CL=1.833-6.138). Additionally, participating in special education services (OR=2.018, CL=1.086-3.749), having a sexually transmitted infection (OR=4.793, CL=2.365-9.715), or having exchanged sex for drugs or money (OR=5.690, 2.767-11.701) all indicated increased risk of rape perpetration. Having unmarried or divorced parents (OR=1.618, CL=1.102-2.377) and each one unit increase on the score on the parental trust and warmth scale (an increase in score indicates decrease in trust and warmth) (OR=1.175, CL=1.043-1.323), or living in a county with higher rates of juvenile arrest for violent crime (OR=1.007, CL=1.001-1.014) all indicate increased risk of rape perpetration. See Table 5 for full statistics for each binary model. Each row in the table represents a single binary model (e.g., the first row is age regressed upon rape perpetration in a binary logistic regression).

Table 4.5: Wave 1 Bivariate Analysis of Rape (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Age	0.298	0.025	143.65	<.0001	1.347 (1.283-1.414)
Race					
White	Reference				
Black	0.503	0.313	2.59	.108	1.65 (0.896-3.06)
Other	0.481	0.372	1.67	.196	1.62 (0.780-3.350)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Violent Delinquent	0.643	0.212	9.23	.003	1.901 (1.26-2.878)
Non-Violent Delinquent	0.487	0.231	4.45	.035	1.627 (1.035-2.557)
Depression					
None	Reference				
Mild to Moderate	0.051	0.338	0.02	.880	1.052 (0.542-2.042)
Severe	0.742	0.396	3.52	.061	2.101 (0.968-4.561)
Pot Use					
None	Reference				
Once a month or less	-0.053	0.496	0.11	.915	0.949 (0.359-2.507)
Twice a month or more	0.634	0.241	6.90	.009	1.885 (1.174-3.024)
Alcohol Use					
None	Reference				
Once a month or less	-0.467	0.319	2.15	.142	0.627 (0.336-1.170)
Once a week or more	-0.143	0.292	0.24	.625	0.867 (0.489-1.536)
Sexually Abused	1.210	0.308	15.40	<.0001	3.354 (1.833-6.138)
Physically Abused	0.040	0.191	0.045	.833	1.041 (0.716-1.515)
Neglected	-0.007	0.219	0.001	.974	0.993 (0.646-1.526)
Self-Esteem	-0.018	0.035	0.266	.606	0.982 (0.916-1.052)
Social Belonging	0.010	0.034	0.096	.756	1.010 (0.946-1.079)
Social Problems w/ Peers	0.315	0.274	1.32	.250	1.370 (0.801-2.344)
Special Education	0.702	0.316	4.94	.026	2.018 (1.086-3.749)
Suspended or Expelled	0.167	0.238	0.495	.482	1.182 (0.742-1.885)
Never Failed a Class	-0.179	0.259	0.48	.488	0.836 (0.504-1.387)
Teacher Support	0.052	0.069	0.585	.444	1.054 (0.921-1.205)
# of Sexual Partners					
One	Reference				
2-3	0.046	0.347	0.18	.894	1.047 (0.531-2.067)
4 or more	0.284	0.230	1.52	.218	1.328 (0.846-2.084)
STI	1.567	0.361	18.90	<.0001	4.793 (2.365-9.715)
Ever Exchanged Sex for Drugs or Money	1.739	0.368	22.35	<.0001	5.690 (2.767-11.701)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Has at Least One Friend	-0.610	0.571	1.14	.285	0.543 (0.177-1.663)
Friend's Delinquency	-0.028	0.046	0.36	.548	0.973 (0.888-1.065)
Parents' Married	0.481	0.196	6.020	.014	1.618 (1.102-2.377)
AFCD/TANF	0.319	0.262	1.478	.224	1.376 (0.823-2.301)
Parent Education					
College/Graduate School	Reference				
Some College	0.163	0.291	0.31	.576	1.177 (0.666-2.080)
HS Diploma/GED	0.092	0.288	0.10	.749	1.096 (0.624-1.928)
No HS Degree	0.331	0.327	1.02	.312	1.393 (0.733-2.646)
House Quality					
Very Well Kept	Reference				
Fairly Well Kept	-0.156	0.286	0.30	.586	0.855 (0.488-1.499)
Poorly Kept	-0.038	0.335	0.01	.911	0.963 (0.499-1.859)
Very Poorly Kept	0.224	0.388	0.33	.564	1.251 (0.585-2.677)
Parental Trust & Warmth	0.104	0.041	6.41	.011	1.109 (1.024-1.202)
Family Connectedness	-0.027	0.030	0.81	.367	0.973 (0.918-1.032)
Community Poverty	1.567	1.491	1.10	.293	4.792 (0.258-89.130)
High School Graduates	1.290	1.316	0.96	.327	3.631 (0.276-47.838)
Adult Violent Arrest	0.002	0.001	3.57	.059	1.002 (1.000-1.003)
Juvenile Violent Arrest	0.007	0.003	4.56	.033	1.007 (1.001-1.013)

Literature Based Models

Next, models were developed to test consistency with prior studies that were purely descriptive or etiological as compared to an ecological approach. The first multivariate model testing the outcome of rape perpetration versus no rape perpetration consisted of a group of explanatory variables that were significant in both etiology studies and descriptive studies—physical abuse, sexual abuse, neglect, alcohol abuse, and peer aggression. No variables were removed from the model due to problematic multicollinearity. Results of the final model are in

Table 4.6. Only a history of sexual abuse was significant in this model. Possible interactions between sexual abuse and all other variables were tested, however none were retained.

Table 4.6: Model Based on Etiology and Descriptive Studies (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Physically Abused	-0.087	0.222	0.22	.642	0.917 (0.636-1.322)
Sexually Abused	1.216	0.309	15.45	<.0001	3.372 (1.839-6.182)
Neglected	-0.070	0.213	0.109	.742	0.932 (0.614-1.415)
Alcohol Use					
None	Reference				
Once a month or less	-0.438	0.320	1.878	.171	0.645 (0.345-1.208)
About once a week or more	-0.123	0.300	0.166	.683	0.885 (0.491-1.594)
Peer Social Problems	0.294	0.276	1.136	.287	1.342 (0.781-2.304)

X^2=25.03, DF=6, p=.0003

Individual Characteristics Model

The next multivariate model was the individual characteristics portion of the full ecological model. The overall model was significant with four significant explanatory variables: violent delinquency, sexual abuse, exchanging sex for drugs or money and having a sexually transmitted infection. No variables were removed due to problematic multi-collinearity. The final model was determined by theoretical considerations and model fit. Variables not included in the final model were perceived teacher support, self-esteem, ever failed a class, drinking, and non-violent delinquency. The remaining explanatory variables all added to the overall model fit, even when not significant. All possible interaction terms were tested for inclusion in the model, however none were significant or added explanatory power to the model.

Table 4.7: Wave 1 Individual Characteristics and Rape Model (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Age	-0.016	0.104	0.02	.882	0.976 (0.799-1.193)
Race					
White	Reference				
Black	0.396	0.359	1.22	.270	1.443 (0.715-2.912)
Other	0.356	0.370	0.92	.336	1.411 (0.675-2.948)
Violent Delinquent	0.453	0.225	4.06	.044	1.493 (0.938-2.375)
Depression					
None	Reference				
Mild to Moderate	-0.258	0.343	0.57	.452	0.786 (0.398-1.551)
Severe	0.346	0.399	0.75	.386	1.403 (0.623-3.162)
Pot Use					
None	Reference				
Once a month or less	-0.215	0.527	0.17	.684	0.867 (0.326-2.306)
About once a week or more	0.409	0.231	3.14	.076	1.477 (0.940-2.322)
Special Education	0.432	0.380	1.29	.256	1.675 (0.835-3.361)
Suspended/Expelled	-0.215	0.269	0.64	.424	0.800 (0.470-1.361)
Social Problems with Peers	0.066	0.302	0.05	.828	1.079 (0.594-1.960)
Sexually Abused	0.946	0.318	8.83	.003	2.682 (1.391-5.172)
Physically Abused	-0.190	0.184	1.07	.301	0.893 (0.627-1.271)
Neglected	0.065	0.205	0.10	.750	0.887 (0.568-1.385)
# of Sexual Partners					
One	Reference				
1-3	0.121	0.349	0.12	.730	1.113 (0.563-2.201)
4 or more	0.053	0.223	0.06	.813	1.064 (0.689-1.644)
Ever Exchanged Sex for Drugs or Money	1.250	0.394	10.05	.002	3.499 (1.597-7.666)
STI	0.033	0.361	6.68	.010	2.728 (1.386-5.370)

X^2=97.31, DF=18, p=<.0001

Family Characteristics Model

The next model was the family characteristics portion of the full ecological model. The overall model was significant with a single significant explanatory variable: parental trust and warmth. No variables were removed due to problematic multicollinearity. Final model was determined by theoretical considerations and model fit. Variables were removed include interviewer perception of the quality of the family's housing, family socio-economic status, and family connectedness. The remaining explanatory variable adds to the overall model fit even when not significant. An interaction between parental marital status and parental trust and warmth was tested, however it was not significant.

Table 4.8: Wave 1 Family Characteristics and Rape Model (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Parents Married	0.353	0.210	2.83	.093	1.423 (0.943-2.146)
Parent Education					
College/Graduate School	Reference				
Some College	0.154	0.305	0.26	.614	1.166 (0.642-2.120)
HS Diploma/GED	0.144	0.278	0.27	.605	1.155 (0.670-1.991)
No HS Degree	0.350	0.322	1.18	.277	1.420 (0.755-2.669)
Parental Trust & Warmth	0.094	0.041	5.15	.023	1.098 (1.013-1.190)
Family Connectedness	-0.008	0.029	0.07	.785	0.992 (0.938-1.049)

X^2=13.00, DF=6, p=.043

Peer Characteristics Model

Given that both of the variables in the peer model were not significant at the bivariate level, it was not surprising that the peer characteristics model was not significant. Multicollinearity was not at problematic levels. Removing variables from the model did not improve model fit, nor did adding in an interaction term between having a friend and delinquent peer behavior.

Table 4.9: Wave 1 Peer Characteristics Model (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Has at Least One Friend	-0.594	0.563	1.11	.292	0.552 (0.183-1.664)
Delinquent Peer Behavior	-0.025	0.045	0.31	.581	0.976 (0.894-1.065)

X^2=1.19, DF=2, p=<.550

Community Characteristics Model

The next model was the community characteristics portion of the full ecological model. The overall model was significant with one significant explanatory variable: rate of arrest for violent crimes among juveniles at the county level. Results indicate that a one unit increase in the rate of arrest leads to a .7% increase in the risk of perpetrating rape. One unit equaled one arrest per 100,000 people in a given county. No variables were removed due to problematic multicollinearity. The final model was determined by theoretical considerations and model fit. Variables that were removed include community poverty, county level rates of arrest for violent crimes among adults, and county level rates of high school graduates. The overall model was not significant until all these variables were removed.

Table 4.10: Wave 1 Community Model (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Juvenile Violent Arrest	0.007	0.003	4.57	.033	1.007 (1.001-1.013)

X^2=4.77, DF=1, p=<.029

Full Ecological Model

The full ecological model is a combination of each of the prior models: individual, family, peer, and community. Although the peer model was not significant, it was included in the final model in order to keep all levels of the conceptual model intact. No variables needed to be removed due to problematic multicollinearity. The final model was determined by theoretical

considerations and model fit. Variables removed were social problems with peers, number of sexual partners, and having a friend or not. The overall model was significant with seven significant explanatory variables: violent delinquency, marijuana use, history of sexual abuse, exchanging drugs or money for sex, sexually transmitted infection (STI), parental warmth and trust, and peer delinquency. Four of the seven significant variables are significant in binary analysis with rape perpetration as the outcome and in their respective smaller models (i.e., individual characteristics model for violent delinquency, history of sexual abuse, exchanging sex for drugs or money and STI; and family model for parental trust and warmth). However, marijuana use and peer delinquency were not significant in their respective models. Additionally, the peer model overall was not significant. Therefore, controlling for the other variables in the models created significance. The remaining explanatory variables all added to the overall model fit even when not significant. Theoretically based interactions were tested, however none were retained based on lack of significance and model fit. All of the significant variables, except peer delinquency, were positively associated with rape perpetration. Peer delinquency was negatively associated with rape perpetration. See Table 4.11 for estimates, standard errors, chi-square statistics and odds ratios of all variables in the full ecological model.

Table 4.11: Full Ecological Model of Rape (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Race					
White	Reference				
Black	0.038	0.331	0.01	.909	1.039 (0.543-1.987)
Other	0.079	0.388	0.04	.839	1.082 (0.506-2.314)
Violent Delinquent	0.478	0.230	4.32	.038	1.612 (1.028-2.529)
Depression					
None	Reference				
Mild to Moderate	-0.282	0.337	0.70	.403	0.754 (0.390-1.461)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Severe	0.294	0.425	0.48	.490	1.341 (0.583-3.087)
Marijuana Use					
None	Reference				
Once a month or less	0.030	0.535	0.00	.956	1.030 (0.361-2.942)
Once a week or more	0.748	0.256	8.55	.004	2.113 (1.280-3.490)
Special Education	0.361	0.338	1.39	.286	1.435 (0.739-2.783)
Suspended/Expelled	-0.239	0.273	0.86	.764	0.787 (0.461-1.345)
Sexually Abused	0.897	0.311	8.29	.004	2.451 (1.331-4.512)
Physically Abused	-0.232	0.185	1.57	.211	0.793 (0.552-1.140)
# of Sexual Partners					
One	Reference				
1-3	0.131	0.346	0.143	.706	1.139 (0.579-2.243)
4 or more	0.119	0.235	0.257	.612	1.126 (0.711-1.783)
Ever Exchanged Sex for Drugs or Money	1.339	0.393	11.63	.0006	3.815 (1.767-8.236)
STI	1.038	0.368	7.94	.005	2.823 (1.372-5.811)
Aggression Toward Peers	0.067	0.302	0.05	.823	1.070 (0.592-1.934)
Peer Delinquency	-0.123	0.052	5.52	.019	0.884 (0.798-0.980)
Parent Marital Status	0.099	0.230	0.19	.667	1.104 (0.703-1.734)
Parent Education					
College/Graduate School	Reference				
Some College	0.131	0.296	0.20	.659	1.140 (0.638-2.037)
HS Diploma/GED	0.022	0.276	0.01	.936	1.023 (0.595-1.756)
No HS Degree	0.208	0.330	0.40	.529	1.231 (0.645-2.350)
Parental Trust & Warmth	0.082	0.041	4.07	.044	1.086 (1.002-1.176)
Juvenile Violent Arrest	0.006	0.003	3.03	.082	1.006 (0.999-1.012)

Wald X^2=125.76, DF=23, p=<.0001

Multinomial Model

The full ecological model was tested in a multinomial regression to assess how the explanatory variables differed or not among violent delinquents, non-violent delinquents and

non-delinquent youth as compared with sexually violent youth. The model was significant (Wald chi-square=1651.19,df=66,p=<.0001). There were two variables; history of sexual abuse and exchanging sex for drugs or money that were significantly different across all three comparison groups. All three groups were less likely to have a history of sexual abuse or to have exchanged sex for drugs or money than the youth who perpetrated rape. There were four variables that are significant for two different groups. They were: marijuana use, sexually transmitted infection (STI), peer delinquency, parent education, and parental trust and warmth. Both non-delinquents and violent delinquents were less likely to use marijuana once a week or more (the highest use category) than rape perpetrating youth. There were no differences among the groups at less frequent levels of marijuana use and for non-violent delinquents with higher levels of use. Both non-delinquents and violent delinquents were less likely to have reported and STI diagnosis than the rape perpetrating youth. There was no significant difference between non-violent delinquents and the rape perpetrating youth. Non-violent and violent delinquents were both more likely to report their closest friends as having delinquent behaviors than rape perpetrating youth. Non-violent delinquents were less likely to have parents who had not completed high school or with only a high school diploma or GED as compared to completing college than rape perpetrating youth. Parents of non-delinquents and of non-violent delinquents had higher levels of trust for and warmth toward their children (as evidenced by a lower score on the Parental Trust and Warmth Scale) than parents of rape perpetrating youth. Finally there were six variables with differences between one comparison group and the rape perpetrating youth. These six were: depression, having been suspended or expelled from school, history of physical abuse, number of sexual partners, aggression toward peers, and county rates of arrest for violent crime among juveniles. Non-delinquents were less likely to have severe depression (as compared to no

depression), to have had four or more sexual partners, and be aggressive toward peers than rape perpetrating youth. Non-delinquent youth also lived in counties with lower rates of arrest for violent crime among juveniles than rape perpetrating youth. Violent delinquents were more likely to have been suspended or expelled and to have a history of physical abuse than rape perpetrating youth. See Table 4.12 for estimates, standard errors, chi-square statistics and odds ratios for all variables in this model.

Table 4.12: Multinomial Model for 3 Delinquent Types and Non-Delinquents (N=3,854)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Race					
White	Reference				
Black					
--None vs. SV	-0.058	0.320	0.03	.857	0.944 (0.504-1.766)
--Non-Violent vs. SV	-0.697	0.365	3.64	.056	0.498 (0.244-1.018)
--Violent vs. SV	0.051	0.345	0.02	.883	1.052 (0.535-2.070)
Other					
--None vs. SV	-0.134	0.385	0.12	.727	0.874 (0.411-1.861)
--Non-Violent vs. SV	-0.174	0.469	0.14	.712	0.841 (0.335-2.109)
--Violent vs. SV	-0.031	0.404	0.01	.939	0.970 (0.439-2.141)
Depression					
None	Reference				
Mild to Moderate					
--None vs. SV	0.022	0.343	0.00	.948	1.023 (0.522-2.002)
--Non-Violent vs. SV	0.486	0.372	1.71	.192	1.625 (0.784-3.369)
--Violent vs. SV	0.416	0.346	1.45	.229	1.516 (0.769-2.989)
Severe					
--None vs. SV	-0.884	0.425	4.33	.038	0.413 (0.179-0.950)
--Non-Violent vs. SV	-0.064	0.450	0.02	.887	0.938 (0.389-2.264)
--Violent vs. SV	-0.083	0.424	0.04	.845	0.920 (0.401-2.113)
Pot Use					
None	Reference				
Once a month or less					
--None vs. SV	-0.541	0.539	1.01	.315	0.582 (0.202-1.673)
--Non-Violent vs. SV	0.431	0.540	0.64	.425	1.538 (0.534-4.430)
--Violent vs. SV	0.252	0.526	0.23	.632	1.287 (0.459-3.608)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
Once a week or more					
--None vs. SV	-1.192	0.255	21.86	<.0001	0.304 (0.184-0.500)
--Non-Violent vs. SV	0.313	0.301	1.08	.298	1.367 (0.758-2.466)
--Violent vs. SV	-0.636	0.247	6.63	.010	0.529 (0.326-0.859)
Special Education					
--None vs. SV	-0.549	0.333	2.72	.099	0.577 (0.300-1.110)
--Non-Violent vs. SV	-0.674	0.376	3.21	.073	0.510 (0.244-1.066)
--Violent vs. SV	-0.233	0.342	0.46	.496	0.793 (0.406-1.548)
Suspended/Expelled					
--None vs. SV	-0.349	0.260	1.81	.178	0.705 (0.424-1.173)
--Non-Violent vs. SV	-0.265	0.281	0.89	.345	0.767 (0.443-1.329)
--Violent vs. SV	0.729	0.258	7.96	.005	2.074 (1.250-3.441)
Sexually Abused					
--None vs. SV	-0.883	0.344	6.59	.010	0.414 (0.211-0.812)
--Non-Violent vs. SV	-1.117	0.387	8.32	.004	0.327 (0.153-0.699)
--Violent vs. SV	-0.941	0.322	8.54	.004	0.390 (0.208-0.734)
Physically Abused					
--None vs. SV	-0.090	0.190	0.22	.638	0.914 (0.630-1.327)
--Non-Violent vs. SV	0.095	0.256	0.14	.711	1.099 (0.666-1.814)
--Violent vs. SV	0.384	0.194	3.93	.048	1.468 (1.004-2.147)
# of Sexual Partners					
One	Reference				
1-3					
--None vs. SV	-0.183	0.347	0.277	.599	0.833 (0.422-1.644)
--Non-Violent vs. SV	-0.113	0.381	0.088	.767	0.893 (0.423-1.885)
--Violent vs. SV	-0.058	0.357	0.026	.871	0.944 (0.469-1.899)
4 or more					
--None vs. SV	-0.559	0.238	5.50	.019	0.572 (0.359-0.912)
--Non-Violent vs. SV	-0.369	0.274	1.81	.178	0.692 (0.404-1.183)
--Violent vs. SV	0.161	0.236	0.47	.495	1.175 (0.740-1.864)
Ever Exchanged Sex for Drugs or Money					
--None vs. SV	-1.694	0.480	12.44	.0004	0.184 (0.072-0.471)
--Non-Violent vs. SV	-1.810	0.621	8.51	.004	0.164 (0.048-0.552)
--Violent vs. SV	-1.114	0.383	8.44	.004	0.328 (0.155-0.696)
STI					

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
--None vs. SV	-1.018	0.384	6.96	.008	0.361 (0.170-0.770)
--Non-Violent vs. SV	-0.931	0.496	3.53	.060	0.394 (0.149-1.042)
--Violent vs. SV	-1.049	0.374	7.87	.005	0.350 (0.168-0.729)
Aggression Toward Peers					
--None vs. SV	-0.841	0.303	7.70	.006	0.431 (0.238-0.781)
--Non-Violent vs. SV	-0.259	0.348	0.55	.457	0.772 (0.390-1.527)
--Violent vs. SV	0.235	0.283	0.69	.406	1.265 (0.727-2.202)
Peer Delinquency					
--None vs. SV	0.037	0.053	0.49	.482	1.038 (0.936-1.150)
--Non-Violent vs. SV	0.139	0.064	4.75	.029	1.149 (1.014-1.301)
--Violent vs. SV	0.171	0.055	9.82	.002	1.187 (1.066-1.321)
Parental Marital Status					
--None vs. SV	-0.182	0.246	0.55	.460	0.834 (0.515-1.351)
--Non-Violent vs. SV	-0.272	0.251	1.17	.280	0.762 (0.466-1.247)
--Violent vs. SV	-0.061	0.238	0.07	.799	0.941 (0.591-1.500)
Parent Education					
College/Graduate School	Reference				
Some College					
--None vs. SV	-0.106	0.314	0.11	.736	0.899 (0.486-1.664)
--Non-Violent vs. SV	-0.206	0.336	0.38	.539	0.814 (0.421-1.572)
--Violent vs. SV	-0.140	0.307	0.21	.649	0.869 (0.476-1.587)
HS Diploma/GED					
--None vs. SV	-0.107	0.297	0.13	.718	0.898 (0.502-1.607)
--Non-Violent vs. SV	-0.741	0.318	5.41	.020	0.477 (0.255-0.890)
--Violent vs. SV	0.059	0.286	0.04	.837	1.060 (0.605-1.858)
No HS Degree					
--None vs. SV	-0.259	0.332	0.61	.435	0.772 (0.403-1.479)
--Non-Violent vs. SV	-1.145	0.422	7.36	.007	0.318 (0.139-0.728)
--Violent vs. SV	-0.067	0.354	0.04	.850	0.935 (0.467-1.872)
Parental Trust & Warmth					
--None vs. SV	-0.096	0.042	5.23	.022	0.909 (0.837-0.986)
--Non-Violent vs. SV	-0.117	0.046	6.32	.012	0.890 (0.813-0.975)
--Violent vs. SV	-0.069	0.041	2.80	.094	0.933 (0.861-1.012)
Juvenile Violent Arrest					
--None vs. SV	-0.008	0.003	5.51	.019	0.993 (0.986-0.999)
--Non-Violent vs. SV	-0.006	0.003	2.63	.105	0.995 (0.988-1.001)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
--Violent vs. SV	-0.004	0.003	1.45	.228	0.996 (0.990-1.003)

Wald X^2=1651.19,df=66,p=<.0001

Young Adult Outcomes

For the second aim of this dissertation six young adult outcomes of rape perpetrating adolescents were explored: graduating high school, full-time work or schooling, arrest, stable romantic cohabiting relationships, physical interpersonal violence, and sexual interpersonal violence. The sample for Aim 2 consisted of male respondents who reported being sexually active in Wave 1 who also participated in the Wave 3 survey and have Wave 3 weight data available (N=2,699). The mean age of participants was nearly 23 years old. Racially, the total sample was 60% Caucasian, nearly 29% African American, and 11% other ethnic and racial minorities (including Asian, Native American, and bi-racial respondents). A total of 90 (3.3%) of respondents in this subsample had reported physically forcing sexual activity with a female during Wave 1. Table 4.13 has number of cases, weighted proportions and standard errors for all outcome variables used in the analyses. Mean and standard error for age, a continuous variable, are presented.

Table 4.13: Wave 3 Descriptive Statistics (N=2,699)

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
Age	22.9	.091
Race		
White	1620 (60.0%)	.035
Black	779 (28.9%)	.034
Other	300 (11.1%)	.011
Perpetrated Rape in Adolescence (Wave 1)		
No	2609 (97.7%)	.006
Yes	90 (3.3%)	.006

Explanatory Variables	# of Cases (Wt. Prop.) or Mean	SE
High School Graduate		
No	540 (22.45%)	.017
Yes	2159 (77.55%)	.017
Full Time Work or School		
No	197 (7.3%)	.008
Yes	2502 (92.7%)	.008
Arrest		
Never	2523 (93.5%)	.011
One or more times	176 (6.5%)	.011
Stable Romantic Partnership		
No cohabitation or marriage	1033 (55.5%)	.016
1 cohabitation or marriage	1059 (30.2%)	.014
2 or more cohabitations and/or marriages	954 (14.3%)	.014
Physical Interpersonal Violence		
Never	2377 (88.1%)	.008
One or more times	322 (11.9%)	.008
Sexual Interpersonal Violence		
Never	2393 (88.7%)	.009
One or more times	306 (11.3%)	.009

Table 4.14 shows results of a series of binary logistic regression analyses to explore the young adult outcomes of rape perpetrating youth. There were 90 young male adults who reported physically forcing sexual intercourse in the Wave 1 questionnaire, thus had a known history of perpetrating rape. These youth were compared with the other male youth who were sexually active in Wave 1, but who did not report perpetrating rape. As compared to non-rape perpetrating youth, in young adulthood, the rape perpetrating youth were more likely to have been arrested at least once after the age of 18. There were no significant differences between those with a history

of rape and those without such a history in high school graduation, full time work or schooling, stable romantic cohabiting, and perpetration of physical or sexual domestic violence.

Table 4.14: Young Adult Outcomes of Rape Perpetrating Youth (N=2,699)

Explanatory Variable	Estimate	SE	Wald X^2	p	Odds Ratio (CL)
High School Graduation	-0.410	0.304	1.82	.177	0.663 (0.365-1.204)
Full Time Work or School	-0.031	0.643	0.00	.961	0.969 (0.275-3.417)
Arrest	1.236	0.371	11.08	.001	3.440 (1.662-7.120)
Stable Romantic Cohabiting					
No cohabitation/marriage	Ref.				
1 cohabitation/marriage	0.054	0.340	0.03	.875	1.055 (0.542-2.052)
2 or more cohabit/marriage	-0.136	0.444	0.09	.760	0.873 (0.366-2.085)
Physical IPV	0.449	0.361	1.55	.214	1.566 (0.772-3.178)
Sexual IPV	-0.244	0.361	0.45	.501	0.784 (0.386-1.592)

Chapter 5

Discussion

The purpose of this study was to provide better understanding of the risk and protective factors associated with the perpetration of rape by adolescent males in the general population and to add the knowledge about the young adult outcomes of these adolescents. There is limited information available about adolescents who perpetrate rape outside of incarcerated populations. Understanding this group is key to implementing effective programs to support the prevention of rape.

The prevalence finding of this study appears to fit well with previous prevalence studies among general population youth. Among the sexually active males that make up the study sample, 3.8% reported raping a woman. This is similar to findings of the previous nationally representative general population study (Ageton, 1983). However, these findings are lower than findings of other general population studies that examined more limited population sample. Other studies include findings of sexual violence rates among males of 4.8% and 10.0% (Banyard et al., 2006; Borowsky et al., 1997). Therefore, the overall percentage of males who report sexually violent behavior is similar in the two nationally representative studies, but quite different among other general population studies. These differences may be due to differences in the samples (e.g., nationally representative versus single state study) or differences in how questions about sexual violence were asked (e.g., Banyard's (2006)) question about sexual violence are relatively vague asking "have you made some do something sexual that they didn't want to do" without definition of the sexual act and are no narrowed by gender of victim or perpetrator. Not surprisingly, the resulting percentages of males who report sexual violence are

higher). This study specifically measures one type of sexual violence: penetrative, vaginal rape perpetrated by male adolescents against women.

Discussion of Aim 1

Aim 1: To examine which individual, family, peer and neighborhood factors contribute to or protect from adolescent onset rape perpetration using a nationally representative general population sample of male adolescents.

In the final multivariate model, nearly all of the significant variables increased the odds of perpetrating rape, except having delinquent peers. Each additional one friend with delinquent behaviors was associated with about a 12% decrease in risk of perpetrating rape. This finding seemed to contradict prior studies on sexually violent youth which found that spending time with delinquent peers increased the risk of perpetrating sexual violence (Ageton, 1983). There are several possible explanations. First, the association between rape perpetration and peer delinquency was only significant in the multivariate model. In the bivariate model, peer delinquency was not significantly associated with rape. Therefore, it appears that inclusion in the multivariate model, and the concurrent controlling for other factors, leads to the significant association. In the model testing process, all possible interactions were tested and there were no significant interactions with peer delinquency therefore, interaction with another variable does not explain the significance. Another possibility is that the delinquent behaviors measured for the peer delinquency variables are relatively mild, including smoking, drinking and marijuana use. This variable does not include more serious delinquent behaviors such as using weapons. Possibly if peer delinquency included measures of more serious delinquent behaviors, the findings would have been different. It may also be that the nature of the questions about peer delinquency results in a peer delinquency scale that is more a measure of peer substance

problems than peer general delinquency. Finally, and most likely, it may be that a lower score on the peer delinquency scale was acting as a proxy for not having friends or having friends that they don't spend much time with or know what they do outside of school. That is, those who responded that they have no friends with delinquent behaviors, in fact, have no friends or have friends with whom they do not spend much time. This possibility would fit with prior studies which have found that sexually violent youth have weak peer social skills (Michelson & Wood, 1982; Ronis & Borduin, 2007).

In contrast, parents who reported lower levels of warmth and trust toward their child had children that were nearly 10% more likely to report rape perpetration for each on one point difference on the scale of parental warmth and trust. Scoring on the parental warmth and trust scale spanned 20 points (from 5 to 25), therefore potential differences from those with the lowest levels of parental warmth and trust to those with the highest levels were quite large. Prior studies have found limited impact from family related issues on sexually violent behaviors and very few differences in family factors between sexually violent and other delinquent youth (Awad et al., 1984; Banyard et al., 2006; Bischof & Stith, 1995; Fagan & Wexler, 1988; Ronis & Borduin, 2007). However, in this study the impact of parental warmth and trust is rather strong and merits serious consideration as a key factor in treatment of youth who perpetrate rape and as a target for prevention.

Respondents with violent delinquent behaviors were 1.6 times more likely to report rape perpetrating behaviors and respondents with more frequent marijuana use were over two times more likely to report rape perpetrating behavior. Although these two factors did not have the most dramatic relationship in this study with the perpetration of rape, they merit attention. Perhaps most notably, these findings indicate that further research is needed. There is little

information from past studies on sexually violent youth and drug use other than in comparison to other types of delinquent youth, and even this information is limited (Awad & Saunders, 1991; Fagan & Wexler, 1988; van Wijk et al., 2005, 2007). The findings of this study indicate that the marijuana use of youth who perpetrate rape may be at problematic levels, possibly due to self-medicating for untreated sexual trauma due to childhood sexual abuse.

The respondents who had a history of childhood sexual abuse were two and a half time more likely to report rape perpetrating behaviors. This finding is similar to other studies on sexual violence perpetration among general population youth (Banyard et al., 2006; Lodico et al., 1996). Clearly childhood sexual abuse is a serious risk factor for perpetrating rape. When combined with the findings that respondents who have had an STI diagnosis were 2.8 times more likely and those who have ever exchanged sex for drugs or money are 3.8 times more likely to report perpetrating rape, it seems that the rape perpetrating youth in this study are more sexually reactive than sexual predators. It appears that the youth in this study who perpetrate rape suffer from untreated trauma due to childhood sexual abuse and are acting out sexually, as evidenced by high rates of STI and exchanging sex for drugs or money.

Hypothesis 1a: Youth with a history of maltreatment will be more likely to perpetrate rape.

This hypothesis was partially supported. Youth with a history of sexual abuse prior to age 12 were more likely to perpetrate rape, even when controlling for a myriad of other risk factors. However, youth who experienced physical abuse or neglect were not found more likely to perpetrate rape. Therefore, it appears that the *type* of maltreatment was important in ascertaining risk factors for perpetrating rape. As discussed above, it seems that the trauma of sexual violence victimization has a serious impact on the youth who perpetrated rape in this study. It is important

to note that the majority of children who are sexually abused do not go on to rape in their adolescent or adult years. While having been sexually abused does not excuse the behavior of harming others, it does provide a key target for both prevention and intervention. Treating the sexual trauma of adolescent males will likely make a significant difference to the victims themselves in terms of decreased trauma symptoms. Additionally, it appears that treating victims may reduce the risk of others becoming victims, therefore, the intervention becomes the prevention.

Hypothesis 1b: Youth with a history of aggression toward peers will be more likely to perpetrate rape.

This hypothesis was not supported at the bivariate level or in any of the multivariate models. The original study that found aggression toward peers to be a significant factor in the risk for perpetrating rape measured physical aggression toward peers. The measurement of aggression toward peers in this study included both physical and social aggression. Possibly, differences in measurement explain the difference in findings.

Comparisons Among Forms of Delinquency

Comparisons among forms of delinquent behavior in the literature are often contradictory and difficult to assess due to differences in measurement and methodologies. Findings of this study may contribute to illuminating some of the differences in risk and protective factors operating among delinquent groups and non-delinquent youth. For example, in this study several factors differentiated rape perpetrating youth from violent delinquents. Violent delinquents were about half as likely as rape perpetrating youth to use marijuana at least once a week (as opposed to less frequent use). This contradicts previous literature which generally found that violent delinquents were more likely to use substances than sexually violent youth (Awad & Saunders,

1991; Fagan & Wexler, 1988; van Wijk et al., 2005, 2007). This finding appears to support the possibility that the youth who perpetrate rape may be using marijuana at relatively higher levels in order to self medicate symptoms from untreated sexual trauma due to their childhood sexual abuse. This fits with the findings about differences in abuse history and sexual behaviors among the groups. In terms of abuse history, violent delinquents were about one third less likely to have been sexually abused, but about one and half times more likely to have been physically abused than rape perpetrating youth. Additionally, the violent delinquent group was about one third less likely to have ever exchanged sex for drugs or money or to have had an STI diagnosed than the rape perpetrating youth.

In regards to school related delinquent behaviors, violent delinquents were over two time more likely to be suspended or expelled from school than rape perpetrating youth. There has not been a previous study that compared school suspensions between sexually violent youth and other types of delinquents. Previous literature on other academic related issues have found that sexually violent youth perform both worse (van Wijk et al., 2005) and better (Awad & Saunders, 1991) in school while multiple studies have found no differences (Caputo et al., 1999; Jacobs et al., 1997; Lewis et al., 1981; Tarter et al., 1983).

Finally, for each one friend increase in the number of delinquent friends a respondent was 20% more likely to be in the violent delinquent group as opposed to the rape perpetrating group. This is a new addition to the literature that compares sexually violent youth to other types of delinquents. There has not been a previous study that compared peer delinquency between these two groups. This supports the idea that male adolescents who perpetrate rape may be more loners than spending time with groups of delinquent peers.

Overall there were far fewer characteristics that differentiated non-violent delinquent youth from rape perpetrating youth. Non-violent delinquents were about one third less likely to have been sexually abused in childhood than the rape perpetrating youth. Additionally, they were 84% less likely to have exchanged sex for drugs or money than rape perpetrating youth. These findings support the idea that the youth who perpetrate rape are acting out sexually in response to their own untreated trauma due to childhood sexual abuse.

In terms of parent education, non-violent delinquents were about half as likely to have a parent with a high school diploma as compared to a college degree and about one third as likely to have a parent with no high school diploma as compared to a college degree than rape perpetrating youth. In other words parents of non-violent delinquents were more likely to have attained higher education levels than the parents of rape perpetrating youth. This is an interesting finding which contradicts prior literature (Awad et al., 1984). Further research is needed because the studies have measured additional items beyond education (e.g., occupation and income) which may have influenced the findings.

This study found interesting effects for peers and families. For each one friend increase in the number of delinquent friends a respondent was 15% more likely to be in the non-violent delinquent group as opposed to the rape perpetrating group. In other words, having friends who engage in lower level delinquent behaviors is associated with engaging in non-violent delinquent behaviors. In contrast, parents who report lower levels of warmth and trust toward their child, had children that were 11% less likely to be in the non-violent delinquent group rather than the rape perpetrating group for each one point difference on the scale of parental warmth and trust, which ranges from 5 to 25. Said another way, parents with higher levels of warmth and trust are more likely to have children who are non-violent delinquents rather than rapists.

Factors related to sexual history, experiences and abuse were the clearest differentiators between the groups. Youth that perpetrated rape were more likely to have a history of sexual abuse, more likely to exchange sex, and more likely to have an STI than all other groups. Additionally, rape perpetrating youth were more likely to be heavier users of marijuana than both violent delinquents and non-delinquents. The rape perpetrating youth in this study appear more sexually reactive than sexual predators. The high rates of sexual abuse coupled with high risk sex behaviors and outcomes of exchanging sex for drugs or money and STI diagnoses along with self-medicating use of marijuana paint the picture of a group of youth in serious need of trauma treatment for sexual abuse. This group would likely benefit from integrating psycho-education about healthy sexuality and sexual relationships into the trauma treatment. The rape perpetrating youth had more troubled family relationships than the non-delinquent and non-violent delinquent youth, as indicated by lower levels of parental warmth and trust. It appears rape perpetrating youth would benefit from integrating family treatment into the trauma treatment to support parents in developing more effective parenting skills and addressing other family difficulties which may in turn increase their feelings of warmth and trust for their children.

Discussion of Aim 2

Aim 2: To explore early adult indicators of success and/or failure—high school graduation, full time employment/school, stable romantic partnering, interpersonal violence, and arrest —for those who self-reported rape perpetration in adolescence. There is no hypothesis for this Aim as there is no literature on later development of youth who perpetrate rape outside of incarcerated populations. Further, there is no literature that attempts to understand if there is a subset of these youth that appear to have more normative young adult outcomes.

Of the early adult indicators of success and failure that were explored in this study, only arrest after age 18 was significant for youth who perpetrated rape. These youth were more than three times more likely to have been arrested after age 18 than all other youth. Otherwise, they were no more or less likely than other youth to be successful or not in the other areas explored. Notably, rape perpetrating youth were not more likely to be physically or sexually violent in their young adult romantic relationships.

This is one of the most interesting finding of the study. Men who reported perpetrating rape in their adolescence did not report sexually abusive behaviors in their young adult years. This finding clearly speaks to the need for universal prevention among all men, not just those who may be at higher risk for rape perpetration. The group of men who perpetrated rape while in adolescence did not report this behavior in their young adult years, indicating that it is another subgroup of men who perpetrate sexual violence in the young adult years. While it is not clear from this study who is in that group, it is clear that it does not necessarily include the men who perpetrated rape as adolescents.

While the relatively small number of rape perpetrating youth analyzed for this aim raises the question whether more significant results would be found with a large sample, this seems unlikely as the *p* values were not even approaching significance. It appears that youth who reported perpetrating rape in their adolescent years are no more likely than their non-sexually violent peers to be sexually and physically abusive toward romantic partners in their early adult years.

Limitations

Similar to other studies, findings need to be interpreted within the context of numerous limitations. Chief among these is that the main outcome of interest, rape, is measured by a single

question “Did you ever physically force someone to have sexual intercourse against her will?” The question is not asked of females and is posed in such as way as to limit it to heterosexual behavior. This question is limited by only asking about rape against women and not being asked of females in the study. Although males comprise a very small proportion of reported sexual violence victims, nevertheless it would provide important information to be able to analyze data about victimization of all genders. Similarly, males commit the vast majority of sexual violence; however, it would fill a gap in the literature if data about female perpetrators of sexual violence were available. Nonetheless, this study fills a serious gap in the literature. It is a nationally representative study that examined the perpetration of rape against women by adolescent males. Although it does not address all type of sexual violence, it does examine rape, an aspect of sexual violence with serious impact on victims, and provide information on the risk and protective factors associated with perpetrating this behavior.

Another limitation is that there are no follow-up questions about the victim such as age and race, degree of force used, location of the rape, or nature of the perpetrators acquaintance with the victim. Additionally, the question about rape is only asked of males who reported having been sexually active in the past. This potentially eliminates respondents who view consensual sexual activity and forced sex as different categories. Although self-report is an effective means of measuring violent delinquency (cite), multiple measures of delinquent behaviors would likely provide a more thorough measurement of the anti-social behaviors that were measured in this study. Examples of a multi-method measurement strategy include self- report, public records, and verification by collateral sources such as probation officers and parents. However, this is a common shortcoming of general population study samples.

While ideally this study would include both genders and multiple measures, the Add Health data set is nevertheless a nationally representative sample with excellent inclusion of relevant factors of interest that can be used to examine risk and protective factors of rape perpetration among general population youth. A better understanding of how youth who perpetrate rape differ from other delinquent youth and non-delinquent youth provides insight into the development of prevention and intervention programs for these youth. Moreover, data about the young adult outcomes for these youth provides insight into the longer-term life success or failure among this group.

Chapter 6

Implications and Conclusions

There was a serious need for a study of rape among youth in the general population. Prior to the current study, the most recent nationally representative general population study on sexually violent youth was over three decades old. Additionally, despite the scope of youth sexual violence and its negative impact on society, not enough was known about whether risk and protective factors are distinct to this group as compared to other delinquent youth. Without a clear understanding of how these youth who perpetrate rape may differ or not from other delinquents, the effectiveness of those developing and implementing prevention and intervention programs is limited. A clear understanding of how youth who perpetrate rape differ from other delinquents offers guidelines on how to tailor existing prevention or intervention programs to address issues unique to youth who perpetrate rape or to develop new programs for this population. Additionally, a better understanding of the young adult outcomes of youth who perpetrate rape may clarify how prevention and intervention programming in adolescence might be tailored to ameliorate the greatest concerns about negative young adult outcomes.

Practice Implications

This data about risk and protective factors of rape perpetration among general population youth provides key factors to target in intervention programs among general population youth who disclose that they have been sexually abused. Male adolescents and young adult men who have been sexually abused are at higher risk of perpetrating sexual abuse. However, with treatment the risk does diminish. Recidivism rates among sexual violent youth are quite low and with treatment are even lower (Reitzel & Carbonell, 2006). For those that are known to have

been victimized, treating their trauma symptoms with an evidence based practice such as Trauma Focused Cognitive Behavioral Therapy (TF-CBT) is likely to be effective.

The findings that youth who perpetrated rape were significantly more likely to have a history of sexual abuse, have exchanged sex for drugs or money and to have an STI than the non-sexually violent youth stand out dramatically. This constellation of results is a powerful indicator that the rape perpetrating youth appear to be experiencing the effects of untreated sexual trauma. Previous studies indicate that childhood sexual abuse is associated with high risk sex behaviors in adolescence (Arriola et al., 2005; Lemieux & Byers, 2008; Senn et al., 2007; Widom & Kuhns, 1996). Exchanging sex for drugs or money undoubtedly qualifies as a high risk sex behavior with potential for physical, sexual and psychological harm. An STI diagnosis in adolescence may be a result of the childhood sexual abuse or of other high risk sexual behaviors such as not using condoms. This cluster of results indicates that there is a group of young male adolescents with a history of sexual abuse who are acting out sexually with high risk sexual behaviors who are in need of treatment for trauma resulting from sexual abuse, such as Trauma Focused Cognitive Behavioral Therapy (TF-CBT) (J. A. Cohen, Mannarino, Berliner, & Deblinger, 2000). TF-CBT has been shown to have positive effects on sexual acting out and improve mental health and trauma symptoms for children who have been sexually abused (J. A. Cohen, Berliner, & Mannarino, 2010; Deblinger, Mannarino, Cohen, & Steer, 2006; Mannarino, Cohen, Deblinger, Runyon, & Steer, 2012).

Additionally, this study found a significant relationship between sexual violence and heavier marijuana use which may stem from untreated trauma symptoms. This may be the result of "self-medicating" the trauma symptoms. Childhood sexual abuse known to be associated with increased risk of substance use and abuse in the adolescent years (Chandy et al., 1997; Fergusson

et al., 2008; Luster & Small, 1997; Schneider, 2008). Removing the need to self-medicate, that is, reducing trauma symptoms, may help with decreasing the level of marijuana use among sexually abused young men. However, there may also be a need for direct substance abuse treatment. practitioners working with both sexually victimized populations and with substance abusing populations should be aware of the relationship between marijuana use, childhood sexual abuse, and perpetrating rape in order to most effectively treat these issues. Awareness of the relationship between these issues could enable practitioners to make better assessments throughout the therapeutic relationship. For example, a substance abuse practitioner may find that a client who is no longer using marijuana may experience a serious increase in trauma symptoms, necessitating treatment of those trauma symptoms. It may also be that acknowledgement of abusive behaviors on the part of the client could come to light and need to be addressed.

The lower levels of warmth and trust endorsed by the parents of rape perpetrating youth may be creating an additional level of vulnerability for this group. When parents are distant, unsupportive, and even possibly appearing uncaring, adolescents lose a source of support. While it is unclear in this study why a parent might have lower levels of warmth and trust, it is clear that the loss of parental warmth and trust is effecting this group. Treatment for sexually abused young men should included a family component in order to support parents in dealing with their own distress related to the abuse of their child and to improve parenting skills to better support their child in overcoming the trauma of sexual abuse. For example, TF-CBT includes a parent treatment component which has been shown to improve outcomes for non-offending parents related to the their child's abuse (Stauffer & Deblinger, 1996).

Treatment can only be provided to the adolescents who are willing to participate. One of the first indicators of willingness to participate in treatment is actually acknowledging sexual abuse. The respondents in this study who reported a history of sexual abuse are sexually acting out in significantly higher numbers than those who have not been sexually abused. There are effective treatments to address symptoms of trauma (e.g., TF-DBT), however, the traumatized adolescent needs to both have access to treatment and be willing to access treatment. Given that sexual abuse is known to be under reported by both genders, there are changes that need to be made to create safer environments for children and adolescents to report their abuse. There is serious stigma, among males especially, regarding reporting sexual victimization. Certainly in the therapeutic context, practitioners should be aware of and willing to acknowledge that boys and young men can be victims, as well as perpetrators of sexual abuse. there is most often a divide in the treatment context between the treatment of perpetrators and treatment of victims. Practitioners must be aware and acknowledge in treatment that the same client can be both victim and perpetrator.

Prevention Implications

The results of the second aim of this study demonstrate that young men who report perpetrating rape in adolescence grow up to be fairly similar to non-perpetrating young adult men. For most outcomes, both positive and negative, there are no significant differences between the two groups. Rape perpetrating young men are no more likely to have stable cohabiting romantic relationships, abuse their romantic partners physically or sexually, graduate from high school, and hold down a full time job or attend school full time than non-perpetrating peers. For the most part, adolescent males who perpetrate rape appear to have normative outcomes in their young adult years. The exception is arrest. Rape perpetrating male adolescents are significantly

more likely to be arrested after the age of 18 than non-perpetrators. Two prevention implications result.

First, social workers, nurses, psychologists and other service providers at high schools, colleges, and universities should be implementing universal sexual assault prevention programs that target all young men in their settings, not just those who are known to have sexually violent behaviors. It is clear from the results of Aim 2 that adolescents who perpetrate rape do not necessarily become sexually violent young men. However, other studies have found consistent levels of sexual violence among college age men of approximately 14 to 17% (Abbey & McAusland, 2004; Calhoun, 1997; Koss, 1987; White & Smith, 2004). The group of young men who are sexually violent while in their adolescence are not the same group who are sexually violent in their early adult years.

A recent study may provide some guidance for how to approach prevention programming. Thompson, Swartout and Koss (2013) found four trajectories of sexually violence during the college years. First, the majority of men, 71%, were not sexually violent at any time. A second group of 12% started college with higher rates and their sexually violent behaviors decreased over the four years of college. A third group of 8% did just the opposite, starting relatively low and becoming more sexually violent with time. A final group which includes the last 9% started high and continued with high levels of sexually violent behaviors. The two key factors that appeared to influence inclusion in one group over another were hostile masculinity and awareness of peer norms that were supportive of sexual violence. These two factors contribute to so called “rape culture”. That is, a place or situation in which the general culture is supportive of sexual violence. It seems that men who are immersed in this culture are at higher

risk of perpetrating sexual violence. Therefore, prevention programs should address this problematic culture.

Elements of this culture come with the students from their lives prior to school (e.g,. family influence), however recent events at multiple universities (e.g., Penn State, Occidental College, Swarthmore College) demonstrate that the culture at many schools is clearly supportive of sexual violence among both students and administrations. Therefore, prevention programs should be aimed at both students and administrations.

Culture can, and does, change. Colleges, universities, high schools need to implement universal prevention programs in which healthy sexuality and healthy sexual relationships are examined and discussed. Sexual violence must not be tolerated or brushed under the rug, as has happened so often in recent memory (e.g., the Catholic Church and Maryville, MO). An additional change is that sexual assault prevention programming should target young men, as well as young women. Developers and providers of sexual assault prevention programs should acknowledge that boys and men can also be victims of sexual assault and deserve the same protection as girls and women.

Research Implications

This study adds to our knowledge of undetected sexual violence among adolescents, an area about which we have little information. This study also leads to ideas about future research that is needed to answer remaining questions. It remains unknown if whether and how general population youth who perpetrate rape differ from incarcerated and clinical samples of youth who perpetrate rape. It is possible that general population youth differ immensely from incarcerated and clinical samples of sexual offenders. This is an area for future research. A study that compares general population sexually violent youth with incarcerated sex offenders would

clarify possible differences between these groups. In particular it would be beneficial for both treatment providers and prevention program developers to understand how risk and protective factors differ between these groups. In the case of significant differences, universal prevention programs implemented in schools and similar institutions and treatment provided to known perpetrators could be better tailored.

Also, data about young adult outcomes of sexually violent youth is very limited. We know very little about what happens to these young people as they become adults and need information in order to better support and serve their needs. Do they continue to harm others or do they become more productive members of society? The results of this study indicated that male adolescents who perpetrate rape grow up to be quite similar to their non-perpetrating peers, except for significantly higher arrest rates. The other source of date we have about sexually violent youth in the general population comes from studies of college students that included retrospective questions about sexually violent behavior in adolescence (Abbey & McAuslan, 2004; Koss et al., 1987; White & Smith, 2004). Therefore, it is well established that there are young men in college who report sexually violent behaviors in their adolescent years and who may also report sexually violent behaviors in their young adult years. However, more research is needed to better understand differences between those who persist in sexually violent behaviors and those who desist. Additionally, it seems likely that the adolescents in the current study who were arrested at significantly higher rates in their young adult years are not the same as the group who end up participating in surveys while at college. However, we cannot be certain at this time and more research is needed to better understand possible differences and similarities. Therefore, studies with larger samples of sexually violent youth that are followed into the adult years would be highly beneficial. Questions about why arrest rates were significantly higher could be

answered, and possibly improved understanding could help reduce the risk of arrest in the young adult years. Knowledge of young adult outcomes provides insight as to prevention and treatment while in adolescence and beyond. The findings of this study indicate that sexual violent youth go on to be as productive as their non-sexually violent peers in their young adult years. Excepting significantly higher risk of arrest, they are otherwise undistinguished from their peers. Further research examining the young adult outcomes of sexually violent youth with a larger sample of youth is needed in order to address concerns about small sample size in this study such as difficulties doing meaningful analyses of types of arrest with such a small sample of sexually violent youth.

Finally, the fact that the adolescents that perpetrate rape do not appear to continue sexually violent behavior in their young adult years begs the question who are the men who are perpetrating sexual violence in college and later adult years. There seems to be a great deal of desistance among the sample in this study. How and why to adolescent perpetrators rape desist? While we know that treatment makes a serious difference in desistance, are there other factors that also influence it? Are these factors that could be systematically captured in treatment or prevention programs? A series of studies, beginning with qualitative studies that interview those who desist from sexual violence about their own understanding of how and why they stopped their sexually violence behaviors may begin to answer these questions.

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