A MIXED-METHODS EXAMINATION OF THE INFLUENCE OF SOCIAL CONDITIONS AND SOCIAL NETWORKS ON THE SEXUAL RISK BEHAVIOR OF STRUCTURALLY VULNERABLE AFRICAN AMERICAN MALE SUBSTANCE-USERS

Andrea Lynne Heckert

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Health Behavior, Gillings School of Global Public Health.

Chapel Hill
2013

Approved by:

Eugenia Eng, DrPH

Clare Barrington, PhD

J.Michael Bowling, PhD

Elizabeth Costenbader, PhD

William Zule, DrPH

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Abstract

ANDREA LYNNE HECKERT: Mixed-Methods Examination of the Influence of Social Conditions and Social Networks on the Sexual Risk Behavior of Structurally Vulnerable African American Male Substance-Users
(Under the direction of Eugenia Eng, DrPH)

In spite of a decline in HIV infection among many behavioral risk groups in the US, African American men have experienced an increase in HIV incidence over the last decade. Important gaps exist in understanding how social conditions and social networks shape the HIV risk behaviors of structurally vulnerable African American substance-using men.

Manuscript 1 explored how social conditions shape sexual and drug-using norms and behaviors of African American men who have sex with men and women. Using in-depth interviews (n=16), inductive thematic analyses revealed patterns of political, structural, symbolic and everyday experiences of violence that place structurally vulnerable men at risk for HIV. Exposure to violence, ranging from personal addiction and incarceration to institutional racism and homophobia, shaped their masculine identity construction and sexual risk behaviors.

Manuscript 2 examined the relationship between composition and social support function of African American men's networks and their sale of sex for drugs or money to men and/or women. It also examined the relationship between dyadic characteristics, social support function, and unprotected sex among these men and their sexual partners. Using cross-sectional network survey data (n=201), multivariate logistic regression analyses revealed that the men's likelihood of selling sex for drugs or money was lower if they had a greater proportion of employed peers. The likelihood of unprotected sex was higher for sexual partner dyads that were categorized as primary sexual and drug partnerships. While the proportion of peers as sources of social support were not

protective against the sale of sex for drugs or money, these same forms of social support were predictive of unprotected sex within sexual partner dyads.

The findings from this study suggest that the men reside in social environments that are not supportive of HIV prevention. The study calls attention to the persistent influence of violence on masculine identity construction and sexual risk behavior. It is especially pertinent to understand how men's evaluation of their social roles may shape their risk behaviors. Additionally, the influence of sexual partner dyad characteristics and social support on unprotected sex merit further exploration of how risk perceptions and behaviors are socially organized.

Acknowledgements

I would like to express my gratitude to the men who participated in the two parent studies. From the start, my dissertation was rooted in social justice and was an effort toward solidarity. Over time, as I learned more about the social worlds that the men occupy and how they respond to assaults to their dignity and personhood, my dissertation also became a project of deep personal compassion.

I would like to thank Drs. Geni Eng, Clare Barrrington, Mike Bowling, Betsy Costenbader and Bill Zule for their invaluable insights and patience throughout the dissertation process. Geni has been a consummate guide throughout my doctoral training. I would also like to thank Drs. Betsy Costenbader and Bill Zule for entrusting me with their data. I would be remiss if I did not acknowledge Dr. Susan Ennett for her indefatigable dedication to our doctoral training. I would also like to thank the other faculty and staff in the Department of Health Behavior for their dedication to our learning. Specifically, I would like to thank Dr. Suzanne Maman for her friendship and enriching teaching opportunities. As a student, and in a teaching capacity, I have been fortunate to interact with an amazing group of talented and engaged learners at UNC.

I would also like to acknowledge Dr. Gary Cuddeback, from the UNC School of Social Work, for helping me to see prisons and jails as de facto public health outposts, and for responding to my last-minute requests for letters of reference and brainstorming. I would also like to acknowledge Dr. Jim Thomas, of MEASURE and the UNC Department of Epidemiology, for his thoughtful explanation of how the social environment shapes HIV and other health outcomes and for alerting me to the need to become historians when we address health disparities. I would also like to thank Drs. David

Wohl, Carol Golin, Dave Rosen, and Becky White from the UNC School of Medicine for their commitment to research and clinical practice at the intersection of incarceration, HIV care and prevention and for providing me invaluable lessons inside and outside of prisons. Thanks also go to Dr. Chris Wiesen and Paul Mihas from the Odum Institute. I would also like to thank Dr. Tom Valente from the University of Southern California for his gracious guidance on exploring social network analysis.

My friends have been there for me in more ways than I can put into words, I am forever grateful. In particular, I would like to acknowledge Laurie Abler, Stephanie Baker, Rajeev Colaço, Kim Freire, Paul Gilbert, Ali Groves, Mellanye Lackey, Derrick Matthews, Lisa Parker, Malena Rousseau, Lara Vaz and Nina Yamanis. I would also like to acknowledge Dr. Michael Ryan for his wisdom, balanced perspective and compassion. Finally, I would like to express my gratitude to my family, Dianne Fraser, Richard Heckert, Don Fraser, Kristen Knight, Aimee Wagner, Kara Harrington, Jennifer Abeles, Craig Fraser, their partners, and their children, who have provided many opportunities to grow and to celebrate. We do not take for granted what we have created.

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List of Abbreviations

AIDS	acquired immunodeficiency syndrome
ACASI	audio computer-assisted self -interviewing
CDC	Centers for Disease Control and Prevention
HCV	hepatitis C virus
HIV	human immunodeficiency virus
IDU	injection drug user
IRB	institutional review board
LWH	living with HIV
LWHA	living with HIV/AIDS
MSM	men who have sex with men
MSMW	men who have sex with men and women
MSW	men who have sex with women
PDI	peer-driven interventions
PI	principal investigator
RTI	RTI International
SAMS	Sexually Active Men's Study
SATH-CAP	Sexual Acquisition and Transmission of HIV Cooperative Agreement Program
STI	sexually transmitted infection
SNA	social network analysis
VIF	variance inflation factor
UAI	unprotected anal intercourse

CHAPTER 1. INTRODUCTION

1.1 PROBLEM STATEMENT

The human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) epidemic is one of the most pressing public health problems faced by African American communities in the United States (US). African Americans comprise 13% of the US population (1), yet they represented 45% of new HIV infections in 2006 (2). HIV infection is the second leading cause of death among African Americans (3), who are diagnosed at more advanced HIV disease stages and experience the shortest survival after an AIDS diagnosis when compared to other racial/ethnic groups in the US (4). In 2006, the HIV incidence rate for African American men was two times as high as that of African American women and six times as high as that of white men (5).

In particular, structurally vulnerable, African American, men are an established population at risk for HIV acquisition and transmission. Structurally vulnerable individuals occupy social positions that are historically and disproportionately burdened by economic exploitation and multiple forms of discrimination (6). In public health research, these individuals are most often characterized as having limited formal education, a low income, a history of incarceration, and are unemployed or underemployed (7).

Mounting evidence suggests that substance-using African American men are disproportionately engaging in non-commercial sexual exchange with men and women (8-14). Exchange, or transactional sex, has been defined as the trading of sex for drugs, money, other goods, or shelter (10, 15). In many cases, drugs and sex are considered direct currency (16). Sexual

exchange is not merely a survival or subsistence-oriented behavior, but may be considered a normalized strategy for material gain in resource-limited communities (17, 18). Commercial sex work, which is a subcategory of sexual exchange and not the focus of the present study, is more often considered a primary income-generating activity occurring in more delineated spaces, such as brothels and street corners (10). It is more difficult to define and intervene upon less commercial forms of sexual exchange. The distinction between casual and exchange sexual partnerships is often unclear (10), which may make the negotiation of condom use more difficult. The determinants of sexual exchange from the seller's perspective is not clearly understood, although it is assumed that individuals selling sex in this context have less power to dictate condom use with sexual partners who are purchasing sex from them. Greater risk taking is also assumed to occur under the influence of substances during sexual exchange. Studies have demonstrated greater HIV seroprevalence among men and women who engage in sexual exchange (8-13). Sexual exchange was the most salient predictor of HIV risk behaviors among participants in the National Institute of Mental Health Multi-Site HIV Prevention Trial (14). Jenness and colleagues found that male and female study respondents reported engaging in comparable rates of unprotected sex with exchange and non-exchange partners (10). Similarly, in a clinic-based study of men, sexual exchange for drugs or money was associated with unprotected sex and concurrent sexual partnering (12). Another study indicated that the strongest correlate of insertive or receptive unprotected anal intercourse (UAI) among African American MSM and MSMW was engaging in sexual exchange (19).

The HIV prevention field is calling for greater prioritization of substance-using, African American men, especially MSM and MSMW who may not identify as gay or bisexual, who have historically been under-reached by interventions that may address sexual exchange as an HIV risk behavior. Initial findings on sexual exchange among African American populations merit further exploration with respect to African American male substance users (including MSM, MSMW or

MSW) since they may traverse different sexual networks characterized by varied sexual risk behavior norms and HIV prevalence (10, 15, 20, 21). Rietmeijer and colleagues found that, among a diverse sample of MSM, up to one third of the men did not identify as gay and that, among MSM who injected drugs, more than half reported engaging in sexual exchange (22). Additionally, the authors found that the men who engaged in sexual exchange reported a greater number of sexual partners, more frequent anal sex with women and men, and inconsistent condom use during anal sex with casual sexual partners. They also discovered that men who engaged in sexual exchange with men, as well as those who injected drugs, were more likely to report inconsistent condom use during vaginal sex with female partners when compared to other MSM participating in the study (22). Others suggest that up to one third of male respondents recruited for MSM and non-MSM US-based studies report having sex with both men and women (19, 23). Malebranche and colleagues have described this phenomenon as a "bisexual bridge" that may put lower-risk female sexual partners at greater risk of HIV infection (24). However, other studies provide evidence that individuals involved in sexual exchange may not be bridging higher and lower-risk sexual networks. For example, Gorbach and colleagues suggest that sexual exchange behavior may contribute to the concentration of HIV infection among men and women with a "pressing need for drugs and money" (25). With such conflicting evidence, Malebranche and other researchers caution us to move beyond a facile demonization of African American men as vectors of HIV and other sexually transmitted infections (STI).

Millett and colleagues assert that non-gay identification among MSM and MSMW, and the associated risky sexual behaviors described above, are not unique to African American men, though their individual behaviors are often targeted as the main driver of the HIV epidemic faced by African American communities (26, 27). To this point, Friedman and colleagues argue for further research and HIV prevention approaches that move beyond individual behavioral change to address the

influence of sexual and drug-using networks on HIV transmission behavior as well as larger social structures and processes, such as residential racial segregation and racial profiling by police that may shape risk networks and the behaviors within these networks (28). Few studies have addressed commercial and non-commercial sexual exchange by and among men. Whereas scholarship about female sexual exchange and commercial sex work often addresses threats to personal safety and limited power that impede HIV prevention behavior, very little is understood about men who engage in sexual exchange. For example, issues of violence victimization and restricted agency to negotiate condom use, with substance use as a back-drop, have largely gone unexplored (29).

1.2 Study Rationale

The sale of sex for drugs or money as a co-occurring risk behavior with unprotected sex among African American male substance users has been under-examined. The purpose of this mixed-methods study was to understand how social conditions shape the composition, social support function, and normative behavior formation which, in turn, may influence the sale of sex for drugs or money. Additionally, I examined how the dyadic characteristics and social support function of African American male substance-users and their sexual partners were associated with unprotected sex. It is important to understand the determinants of sexual exchange from the seller's perspective because it is assumed that individuals selling sex in this context have less power and control to dictate condom use with sexual partners who are purchasing sex from them. It is also important to note that sexual exchange is not merely a survival- or subsistence-oriented behavior and that it may be considered a normalized strategy for material gain in resource-limited communities (17, 18). Martina Morris, a social network pioneer who examines the influence of social networks on HIV transmission, suggests that we examine the relationships between individual behavior and the "global properties" of networks that generate these behaviors (30). She also states that "the challenge is to formally represent the way that social structure transforms individual

behavior into an often unintended collective outcome" (31). In this case, the unintended collective outcome is the disproportionate HIV burden experienced by African American male substance users in North Carolina.

The present study utilized a mixed-methods design and qualitatively examined how social conditions shape the composition, function, and both the formation and maintenance of behavioral norms within the social networks of African American, male substance users who report high-risk sexual behaviors. The present study also used a separate dataset to quantitatively model how the composition and function of similar social networks of African American male substance users influenced their sale of sex for drugs or money. A second quantitative model examined the association between a set of sexual partner dyadic characteristics and unprotected sex between these same men and their sexual partners. This dyadic analysis expanded on the examination of social network composition in the first quantitative model in order to better understand whether articular dyadic characteristics are a driving force behind condom use among African American male respondents. Findings from the present mixed-methods study can inform more effective, culturally-responsive, network-based interventions to prevent and control transmission of HIV and other sexually transmitted infections (STI) among this population. The nonrandom nature of networks is what makes them inherently social (32) and, therefore, suitable for skills- and norms-based interventions that develop new and bolster existing health-promoting network ties, facilitate multi-faceted social support through lay health advising (LHA), and strengthen health-promoting dynamics within social networks through community-based participatory action (33-35).

1.3 Study Aims

The present mixed-methods study comprised a secondary analysis of a qualitative dataset from the Sexually Active Men's Study (SAMS) and a cross-sectional, network-based quantitative dataset from the Sexual Acquisition and Transmission of HIV Cooperative Agreement Program

(SATH-CAP) Network Study. Overviews of both studies are covered in Chapter Three and are then described in greater detail in Chapter Four. For the first study aim, I used in-depth interview data completed with 16 African American MSMW who participated in SAMS from 2007 to 2008 in two urban counties (Durham and Wake) in North Carolina. For study Aims 2 and 3, I used network survey data from 201 African American MSM, MSMW and MSW who participated in the SATH-CAP network study from 2007 to 2008 in the same two urban counties and two adjacent rural counties (Chatham and Johnston). The 201 African American men represented the largest subset of the SATH-CAP network study dataset, which also contained responses from African American women as well as white and Latino men and women. For study Aim 2, I used responses from the 201 African American men to measure the composition and social support function of the respondents' social networks to predict the African American male respondents' sale of sex for drugs or money. For study Aim 3, I converted the original subset of 201 responses to a dyadic dataset to study the relationship between a set of dyadic characteristics and unprotected sex among African American male respondents and their nominated sexual partners. A dyadic dataset is one in which the original data were converted so that each observation represented the respondent and each nominated alter, that is, a study respondent who nominated two individuals contributed two observations. Therefore, for the third study aim, the converted dataset contained 229 observations.

From this point forward, the qualitative and quantitative study datasets will be referred to as the 'parent study'. Specifically, the mixed-methods study sought to achieve the following complementary qualitative and quantitative aims:

Aim 1: To explore how social conditions shape the composition, function, and both sexual and drug-using behavioral norms of African American men at high risk for HIV acquisition and transmission.

Aim 2: To examine the relationship between the composition and social support function of African American male respondents' social networks and their sale of sex for drugs or money.

Aim 3: To examine the relationship between dyadic characteristics, social support function, and unprotected sex among African American male respondents and their nominated sexual partners.

1.4 Organization of the Dissertation

This first chapter introduces the public health problem of disproportionate HIV disease burden among African American male substance users, selling sex for drugs or money, and the co-occurring risk behavior of unprotected sex. The chapter also specifies the qualitative and quantitative study aims for the mixed-methods study. The second chapter summarizes epidemiologic data for African American men regarding HIV risk and substance use, and synthesizes findings from studies of social conditions relative to the formation and maintenance of behavioral norms, the composition and social support function of social networks, and their influence on HIV risk behaviors among African American male substance users. Reported correlates of selling sex for drugs or money and unprotected sex are presented with special emphasis given to conceptual and methodological approaches used by these studies. The literature review then highlights evidence generated by intervention research that focuses on the social networks of African American male substance users that are designed to reduce behavioral risks for a range of health issues, including but not limited to, HIV. Chapter Two concludes by summarizing the substantive and methodological gaps in the scientific literature that the mixed-methods study sought to address. The third chapter begins by describing mixed-methods studies as part of a pragmatic research paradigm. The theoretical framework for this inquiry will be described and then displayed visually with a conceptual model. Lastly, the third chapter will reiterate the three study aims and specify research questions and hypotheses. The fourth chapter describes both the parent and present study methodologies. Specifically, overviews of the SAMS data used for study Aim 1 and the SATH-CAP

network study data used for study Aims 2 and 3 are provided. Information on the sampling, qualitative domains of inquiry, quantitative measures, data management, and data analysis plans are described for each study aim. The fourth chapter also provides an explanation as to how the study used quantitative and qualitative methods to answer the three study aims with an eye toward an integrated set of recommendations for further research and public health practice. Basic descriptive statistics and a power analysis are included for the SATH-CAP network study data used for study Aims 2 and 3. The potential study limitations, strengths, and significance of the integrated study will complete Chapter Four.

The dissertation is organized with two manuscript chapters. Thus, the fifth chapter includes introduction, methods, results and discussion sections for qualitative study Aim 1. The sixth chapter includes introduction, methods, results and discussion sections for quantitative study Aim 2 and Aim 3. Acronyms and abbreviations were re-introduced in Chapter Five (Manuscript 1) and Chapter Six (Manuscript 2) because these two chapters could be treated as stand-alone manuscripts. In Chapter 5 (Manuscript 1), the term 'participant' is used rather than 'respondent' because it is a more common term used in manuscripts and other written materials that describe individuals who participate in in-depth interviews and other qualitative methods. For reasons of consistency, the Methods Chapter (Chapter Four) uses the term 'respondent' when referring to the men who participated in the both parent studies. The Conclusion Chapter (Chapter Seven) uses the two terms as a means of distinguishing the men from the qualitative and quantitative parent studies when presenting the integrated summary of findings. Chapter Six (Manuscript 2) uses the term 'peer', instead of the more technical term 'alter', for all peers nominated into the respondents' personal networks. This word choice was selected to reduce jargon and to eliminate the need to explain the term 'alter' to an audience who may not be familiar with social network analysis terminology.

Finally, Chapter Seven includes a summary of findings, study limitations, and implications for further research and public health practice as a result of the integrated mixed-methods study.

CHAPTER 2. LITERATURE REVIEW

2.1 Epidemiologic Profile of African American Men and Their Communities

HIV and other STI, including syphilis, chlamydia and gonorrhea, represent one of the gravest sets of health disparities encountered by African American communities (36, 37). In spite of a decline in HIV infection rates among many behavioral risk groups in the US, African American MSM, MSMW, and MSW have experienced an increase in HIV incidence over the last decade (4). In 2006, African American MSM represented 35% of new HIV infections among MSM for all racial/ethnic groups and 63% of new HIV infections among all African American men (5). One study demonstrated that, among African American men recruited in Los Angeles, the odds of living with HIV (LWH) were 30 times greater among MSMW than MSW, and the odds of HIV infection among MSM were 13 times greater than MSW (38). A study of MSM conducted in five US cities found that 46% of African American MSM tested positive for HIV and 67% of these men were unaware of their positive serostatus until participation in the study (39). Similarly, in a six-city study of young MSM who were tested for HIV, 91% of African American young MSM versus 60% of white young MSM were unaware of their positive serostatus until participating in the study (40). Other studies show that African American, non-gay identified MSM report lower HIV screening rates (41, 42) and less consistent condom use (24, 27) than African American MSM who identify as gay. Furthermore, evidence demonstrates that African American MSMW are less likely to disclose their same-sex behavior to at least one sexual partner when compared to African American MSM (19).

After sexual contact with men, injection drug use (IDU) is the second most attributable transmission route for HIV among African Americans. More African American men and women living

with HIV or AIDS (LWHA) are infected through IDU than individuals of other racial/ethnic groups (43). In 2008, IDU behavior accounted for 18% of all AIDS diagnoses among African Americans in the US (44). Furthermore, among African American men LWH, 20% report heterosexual sexual contact as the likely transmission route (44). Moreover, national data suggest that a growing number of HIV infections are due to heterosexual contact and that exchange sex is a key risk behavior driving HIV infection among heterosexual sub-populations (45, 46).

In the Southeastern US, African American men and women comprise 75% of all new HIV cases (46). In 2007, African Americans constituted 67% of North Carolina residents LWHA, although they comprised only 22% of the state's population (47). In this year, 41% of new HIV cases were attributed to MSM behavior followed by 23% of new HIV cases attributed to IDU (48). HIV infection attributed to heterosexual sexual contact among men and women is estimated at 26.9% in North Carolina compared to general US estimates of 18% (48).

It is estimated that the prevalence of HIV is five- to eight-fold greater among US inmates compared to non-incarcerated individuals (49). Estimates also indicate that African American male and female prisoners are five times as likely to live with HIV than individuals who are not incarcerated (50). Blankenship and colleagues remark that "any association between incarceration and black-white disparities in HIV/AIDS that relate to prison as a risk environment results from the greater likelihood that African Americans will be exposed to this environment and not to any differences in risk behavior while incarcerated" (51). In spite of relative stability in racial/ethnic patterns of criminality, US prison populations have shifted dramatically from the 1950s when approximately 70% of inmates were white, to an estimated 60-70% of the state and federal prison populations now consisting of racial/ethnic minorities who, in large part, are sentenced for non-violent, drug-related crimes (52, 53). African American men in North Carolina are over-represented in the criminal justice system. In 2010, African American men represented 48% of North Carolina's

state prison population, though they comprised only 11% of the state population (49) . Rosen and colleagues examined the behaviors and characteristics associated with HIV infection among newly incarcerated inmates in the North Carolina state prison system who participated in voluntary opt-in HIV testing from 2004 to 2006. They found that, among male prisoners, the greatest risk factors for testing HIV positive were MSM behavior, being African American, non-white race/ethnicity, and an age range of 35 to 44 years (54).

It has been posited that the greater representation of African Americans in jails and prisons for drug-related crimes is not necessarily due to greater drug abuse or dependence but, rather, differential policing and prosecution practices for the possession of drugs as well as limited access to adequate legal representation (55). Despite the disproportionate HIV and STI burden experienced by African Americans, there is conflicting evidence as to whether or not African American men engage in more drug-related risky behavior than men or women of other racial/ethnic groups in the US (56-58). For example, using data from the National Longitudinal Study of Adolescent Health, Hallfors and colleagues investigated associations between sexual and drug behavior patterns and HIV and STI rates among African Americans and whites 18 to 26 years of age (37). After accounting for other covariates, they found that, across 11 of 15 high- and low-risk behaviors, African American respondents were significantly more likely to be infected with HIV or other STI compared to white respondents. Most notably, compared to white participants, they found that African Americans were more likely to be infected with HIV and other STI even when the respondents' drug and sexual behaviors were categorized as low risk, including the behavioral category of "few partners and low alcohol, tobacco, and other drug use" (37). Systematic under-reporting of high-risk behaviors among African American respondents was determined to be unlikely. Godette and colleagues evaluated alcohol-related problems experienced by young African American adults using the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions. They found that, other than

Asians, African Americans who drank were significantly less likely to report high-risk or heavy episodic drinking compared to all other ethnic groups. However, among African American drinkers, males and the unemployed were the most likely to report heavy drinking and drinking-related problems with employment, interpersonal relationships, arrest and incarceration, and driving while under the influence (59).

2.2 Social Conditions Undergirding HIV Risk Behavior

Since the advent of HIV/AIDS, scholars and activists have acknowledged the influence of social conditions on HIV transmission (60). This argument has been further underscored by the shift in HIV disease burden over the last 32 years from predominantly white, middle class, gay-identified MSM and IDU to communities of color and other marginalized populations (51, 61, 62). Despite HIV prevention efforts in disadvantaged African American communities, behaviors associated with HIV transmission may persist where individuals confront different material, social and psychological needs not experienced by members of more socially advantaged communities (63). It must also be noted that, despite efforts at safer sex practices, there may be greater STI and HIV incidence in more disadvantaged communities due to more established HIV infection among pools of drug and sexual partners (37, 64, 65), elevated sexual partnership turnover and concurrency (66), and barriers to health care utilization that impede prevention and/or timely testing, and diagnosis and treatment of HIV and other STI (37, 65, 67-70). For example, later in this chapter, the disproportionate incarceration burden experienced by African Americans will be highlighted as a social condition influencing HIV risk behavior, including sexual exchange. This will be followed by a discussion of other social conditions, including employment challenges in marginalized African American communities.

As evidenced later in this chapter, sexual exchange is often correlated with drug consumption. Numerous studies have unearthed social determinants of drug use in African

American communities. For example, across several US inner cities, Kadushin et al. examined relationships between drug dependence and 'interpersonal drug use' and 'neighborhood drug use' systems. While they found greater drug dependence among whites than African Americans, the authors also reported that being African American was the greatest predictor of residing within a neighborhood drug use system where observation of public intoxication, drug use, and easy access to marijuana was more prevalent (71). Similarly, a Baltimore-based study looked at the influence of disadvantaged neighborhoods and social network factors on drug use in predominantly African American neighborhoods. They found that neighborhood poverty was strongly associated with current use of cocaine and heroin (72).

2.2.1 Composition of Personal Networks and Behavioral Norms

Examining the composition of social, drug and sexual networks provides insight into how social conditions shape the social arrangements within communities that are disproportionately impacted by HIV/AIDS. Research has demonstrated the effects of social network composition on health behaviors, including condom use, needle sharing, tobacco smoking (11, 72-74) and HIV risk perceptions (75). These findings help us understand that sexual and drug-use behavioral norms can be formed and maintained within social networks (76, 77). Conversely, it should be acknowledged that individuals select into social networks with similar knowledge, attitudes, beliefs and behaviors (76). Davey-Rothwell et al. found that female IDU networks were more likely to engage in sexual exchange for drugs or money if they believed that their peers endorsed this sexual risk behavior (78). Latkin and colleagues examined the influence of peer condom use norms in a predominantly African American, drug-using community. Fewer of the respondents who injected drugs had peers they perceived to endorse condom use. The authors also found that respondents with the greatest perceived access to health advice and financial support within their networks were the most likely to report health-promoting condom behaviors and norms (11). In an earlier study, Latkin and

colleagues reported that IDU recognized their drug partners as having a greater influence on drug-using behavior than family or friends who they included in their social networks (72). In a separate study, Latkin and colleagues categorized predominantly African American IDU networks into four risk levels and examined the association with various HIV risk behavior norms (79). IDU among the riskiest networks (where multiple members shared needles) were the most likely to perceive their peers as supportive of sexual exchange and risky needle-sharing practices. This relationship was further pronounced among males. Mid-level risk networks of IDU (where multiple members shared cookers but did not share needles) were less likely to endorse risky drug and sexual behavioral norms. Friedman and colleagues discovered that the protective norms among an IDU network were associated with low HIV prevalence among members despite a location in a neighborhood with high HIV prevalence and high levels of risky sexual behavior (80). In the Dominican Republic, Barrington and colleagues found that male partners of female sex workers reported significantly more consistent condom use with these partners if they were encouraged to use condoms by their peers and if they perceived that their peers used condoms consistently (77). Costenbader et al. assessed changes in the composition of IDU social networks in a longitudinal, HIV-intervention study in Baltimore, Maryland. At the intervention follow-up, participants who reported a new set of drug-using members in their social network were more than three times as likely to be in an even riskier behavioral group. Conversely, intervention participants who reported all new non-drug-using members into their social networks increased their likelihood of being in a lower risk behavioral group (81).

2.2.1.1 Incarceration

As described earlier, there is strong empirical evidence demonstrating the association between incarceration and HIV risk behavior and infection among African American male substance users and, in particular, marginalized African American communities in general (21, 24, 51, 53, 66,

82-88). The relationship between incarceration and other explanatory variables is evident throughout much of the literature. Attention to incarceration is warranted as it will inform feasible interventions in criminal justice-related settings and time periods, including pending release from jails, prisons, post-release parole, and probation supervision.

In a study of North Carolina African Americans living with HIV, Adimora and colleagues found that the most salient risk factors associated with HIV infection among women who did not report high-risk sexual or drug-use behavior included sexual partners with a history of incarceration, less than a high school diploma, a recent inability to meet basic living needs, and a sexual partner with concurrent sexual partners (89). Thomas and Torrone describe how the destabilization of North Carolina communities through the "forced migration" of men to jails and prisons contribute to increased STI rates in home communities (90). These studies suggest that sex ratio imbalances and the destabilization of existing sexual relationships in urban and rural African American communities in North Carolina are a result of high incarceration rates and premature mortality among African American men. These factors increase the total lifetime number of sexual partners, impact patterns of concurrent sexual partnering (84), potentially reduce the negotiation power of individuals seeking sexual partnerships with men, and may lead to "an emergence of a market for male sexual services sold to female consumers" (66). More recently, Khan et al. found that newly released, North Carolina ex-offenders engaged in sexual exchange and drug use at higher rates than men who had been released from prison for a greater length of time (20). Blankenship and colleagues describe how a history of incarceration reduces individual earning potential and how this lack of income may impact the ability to negotiate condom use by both men and women (51).

Limited employment opportunities (51, 88, 91) and insecure housing arrangements, including homelessness (92) as well as limited and disrupted access to social support (93), are disproportionately experienced by African American male substance users with and without a

history of incarceration. In turn, these risk factors are associated with sexual exchange and will be described in greater detail in the following sections. A history of incarceration may also prompt greater exposure to these risk factors due to restrictive hiring and housing policies, and social stigma encountered by individuals with a history of incarceration (55, 93, 94).

2.2.1.2 Employment

Community-level unemployment and underemployment are associated with various risk behaviors and poor health outcomes (86, 95). Evidence suggests that potential employers often consider African American men as "suspect" and poor employee prospects, irrespective of personal involvement in the criminal justice system (96). In an examination of the influence of neighborhood poverty and personal network attributes on current drug use, Williams and colleagues found that social networks with a greater proportion of employed peers and peers that could offer social support were protective against current heroin and cocaine use. However, such protective network attributes did not safeguard against the impact of neighborhood poverty on current drug use (72).

Revisiting the intersection of incarceration and unemployment among African American men, Rose and Clear describe how ex-offenders return to home communities with few financial resources and many financial needs, including food and shelter, clothing, transportation, and criminal justice costs (i.e., attorney fees, supervision fines, and court fees) (93). Prison-based vocational and job readiness programs have assisted inmates to secure work upon release, however, such programs are not available to all inmates and limited post-release support of such programs impact their effectiveness (51). For recently released ex-offenders, income-earning opportunities are limited to: (a) finding a job in communities often characterized by high unemployment; (b) remaining unemployed; or (c) returning to crime-based income generation. As Travis et al. state, "time spent incarcerated is time spent networking with other criminals, not legal employers. Upon release, the ex-offenders may have more and stronger relationships with people who earn money

illegally than with people who run legitimate businesses. It appears that as time spent in prison increases, the likelihood of participating in the legal economy decreases" (91). Employment opportunities that are available to ex-offenders tend to be unstable with low wages, limited hours, and no employee benefits, which may necessitate multiple jobs to meet basic needs. Peterisilia explains that, overall, employers are hesitant to offer jobs to individuals with criminal records (97). She and others add that many stable employment fields such as law, medicine, nursing, physical therapy, and education are prohibited from employing individuals with felonies (91).

2.2.1.3 Substance Use

Social, sexual and drug-using networks have a role in shaping and reproducing HIV-related behavioral norms (11, 28, 78, 98, 99). Among a sample of predominantly African American drug users in Baltimore, Maryland, Latkin et al. found that the composition of drug-using networks was associated with sexual exchange for drugs or money. Specifically, individuals who engaged in sexual exchange reported a higher number of crack smokers and a lower number of family members in their social networks (98). In a sample of women who sold sex for drugs or money in Harlem, New York, McMahon and colleagues found that most women used condoms in their last sexual exchange with men, though this relationship was attenuated once substance use was included (18). Norris et al. looked at the relationship between alcohol use, sexual exchange, and STI in Tanzania. They found that respondents believed their sexual exchange was associated with riskier sexual behavior and that alcohol abuse put them at greater risk of future sexual exchange and exposure to STI (100).

In a study examining the spatial bridging of drug-using men who exchanged sex for money in Houston, Texas, Williams and colleagues examined differences in risk behaviors and STI rates among men who sold sex in other cities before traveling to Houston and those who had not traveled outside of the city. A larger proportion of the men who bridged cities identified as gay and approximately one third of them were living with HIV. These men also reported greater marijuana

use, IDU behavior, and more male sexual partners (101). Harawa and colleagues identified drug use as central in same-sex behavior among non-gay-identifying African American men (63). Study respondents described alcohol use, drug transactions, and addiction as: (a) motivating sex with men; (b) allowing and rationalizing same-sex activity and unprotected sex; and (c) facilitating access to male sexual partners (63). Browne and colleagues examined drug use, condom use, number of sexual partners, and history of STI among young African American MSM and MSW enrolled at historically black colleges and universities. They found that MSM reported greater sexual risk behaviors, including alcohol and drug consumption before sexual activity, when compared to the MSW respondents (102). Research on sexual risk behavior of African American MSM and MSMW who used drugs before sex showed that these men were ten times as likely to engage in UAI with male partners than men who were sober (103).

While the following literature does not address sexual risk behavior, including sexual exchange and condom use in the context of drug use, the influence of social network composition on other HIV-related behavioral norms warrants attention as HIV is "a product of social interactions" (104). Tobin and colleagues examined social network characteristics and needle-sharing norms in and outside of shooting galleries among IDU in Baltimore, Maryland. They found that the social networks of IDU who attended shooting galleries were larger, less dense, had more IDU and crack-smoking peers, were younger, and had fewer family members. Overall, they found that a larger proportion of the IDU who attended shooting galleries believed their peers shared needles and would not disapprove of this risk behavior (105). Similarly, De et al. found associations between the IDU network characteristics of peers who were drug users and risky injection norms, including sharing injection paraphernalia (106). In a longitudinal study, Buchanan and colleagues found that former IDU had significantly fewer drug users in their current social networks than respondents who were active injection drug users (107).

2.2.1.4 Sexual Partnering

A greater number of lifetime sexual partners (108) and concurrent sexual partnering (109) are both predictive of HIV and other STI. However, using individual-level data may underestimate STI risk. To illustrate this point, Fichtenberg and colleagues found that individuals situated on the periphery of non-dyadic sexual network components who report just one sexual partner were almost five times more likely to be infected with gonorrhea or chlamydia than individuals in exclusive sexual dyads (110). This underscores previous research suggesting that core members of sexual networks are key drivers of HIV and STI. In an examination of Louisiana sexual networks with a high syphilis prevalence, individuals with untreated primary or secondary syphilis completed sexual network inventories. The authors concluded that a high level of syphilis could be maintained by infected individuals with high-risk behaviors who are centrally located within larger sexual networks of individuals with only moderate sexual risk behavior (111). Neaigus et al. suggest that a core group of drug users drive HIV infection within their sexual networks. Specifically, among the non-injecting heroin users LWHA, sexual partnering was structured around a history of injection, which may serve as a potential bridge between IDU, non-injection drug users and individuals with fewer HIV-related risk behaviors (112). Rhodes and Quirk examined how heroine and other opioid drug users' sexual relationships are socially organized places of risk where sexual relationships with drug and non-drug users pose distinct dynamics that influence risk behavior (104). Research demonstrates an association between social isolation, sexual partnering and STI risk. Youm and Laumann found that individuals with fewer than 13 lifetime sexual partners and no social friends were slightly more likely to have ever been infected with an STI compared to individuals who were not socially isolated. Among individuals with 13 or more lifetime sexual partners, those with many weak but abundant friendships were slightly more likely to have ever been infected with an STI than individuals with fewer friendships or greater closeness to these friends (113).

2.2.2 Social Support Function of Personal Networks

The provision and receipt of social support within social networks may influence health-promoting and health-damaging behaviors (114-116). Social support has influenced the retention of African American and Latino MSMW in HIV care in the face of HIV-related stress, including HIV disclosure and experiences of HIV-related stigma (114). Knowlton et al. found similar results with HIV disease management and differential ability to mobilize types and sources of social support (83). Moreover, low peer support has been associated with UAI among African American and Latino MSM (117).

Among drug users, social support has been associated with engaging in HIV risk behavior (116) as well as HIV preventive behavior (72, 118). This contradiction may exist because the receipt of social support from a higher risk individual may influence a recipient's decision to engage in HIV risk behavior (118). Furthermore, the nature of substance users' income- and drug-generating strategies "mandate risky practices" within their social networks where sharing drugs and exchanging sex for drugs or money may result in and be a result of "reciprocal debt obligations" (119). Miller and Neaigus explain how female drug users may not be able to reciprocate particular kinds of support, especially in the context of drug acquisition. As a consequence, alternative reciprocal exchanges may occur and social support may "mask and be commingled with coercion, so that support may include aspects of dependence" (118). Moreover, drug users may place a burden on their peers with their high need for instrumental and emotional support which, in turn, may limit their peers' ability or willingness to provide support or may limit the drug users' willingness to accept the support that is offered (120).

In Menjivar's work examining the social networks of Salvadoran immigrants in the US, she questions the common assumption that social networks are static, impenetrable and independent of broader social forces when she describes how certain aspects of social networks do not always

serve to buffer hardships that members of disadvantaged communities encounter. She states "broader forces shape the internal dynamics of social networks…however, actors have agency, they do not react mechanically or deterministically to broader processes...shared experiences do not automatically breed cohesive and supportive networks" (121). Restricted employment opportunities may serve to alienate African American men by limiting and disrupting job skill development as well as social support from employed peers which may put African American male substance users at greater risk of engaging in the informal market. Among men living in areas of high unemployment, including many with a criminal record, unemployment puts a great financial strain on families and reduces the supportive potential of social networks in home communities (55). For those who have been incarcerated, reentry punctuates the disrupted access to resources and social support, and may have a lasting impact on children, families, and communities (93) by impacting African American men's ability to "participate fully as fathers, husbands, or as valued members of their communities" (96). Similar to Thomas' description of North Carolina incarceration as a forced migratory phenomenon, Clear and colleagues argue that incarceration should be considered a form of coerced mobility which contributes to greater social disorganization and disrupts the function of social networks that are the source of social control and mutually beneficial forms of social support (55).

2.2.3 Sex Partner Dyad Characteristics

2.2.3.1 Social Support, Type of Sexual Partnership & Drug Partnering

Among predominantly African American female drug users in Harlem, New York City, 22% of the women were LHWA, and the same proportion did not use a condom during their last sexual exchange for drugs or money. Eighty percent used non-injection drugs (mostly crack cocaine) before and during the exchange. Among the women who had unprotected sex at this exchange, the reasons reported were primarily centered around client wishes, though one fifth of the women

reported that a condom was not used because they had known the client for “a long time” (18). Similarly, Murray and colleagues looked at relationship intimacy and consistent condom use among female sex workers and their regular paying sexual partners in the Dominican Republic. They found a negative relationship between perceived intimacy and consistent condom use between female sex workers and their regular paying clients (122).

In networks where drug use is prominent, Zule describes how shared syringe use between sexual partners may connote trust and reciprocity rather than risk of HIV or hepatitis C virus (HCV) transmission (123). Valente and Vlahov examined selective risk taking among participants involved in a needle exchange program. The authors found that over three quarters of IDU reported sharing syringes with drug partners who they considered close friends. The likelihood of sharing syringes was strongest with partners who were considered close ties. They also found that there was substantial turnover in friendships over the course of the longitudinal study, which led them to conclude that selective risk-taking was occurring though it was not necessarily a risk reduction practice (124). Neaigus and colleagues examined dyadic characteristics associated with receptive syringe sharing (i.e., injecting with a used syringe after a drug partner uses it) among a multi-ethnic sample of IDU in the US (115). About one quarter of respondents reported receptive syringe exchange. This risk behavior was associated with sexual exchange for drugs or money, being African American, having no history of drug treatment, and crack cocaine and heroin use. Receptive syringe sharing was more likely to occur with drug partners with whom they had regular contact, with whom they had injected for at least one year, with whom they considered a “very close” relationship, and who were sexual partners (115).

2.2.3.2 Biological Sex of Sexual Partners

Few studies have examined the role of biological sex in condom use behavior among substance-using MSM, MSMW, and MSW of any race/ethnicity. Recent research has found that

African American MSMW are more likely than African American MSM to report sexual exchange, although it is unclear if MSMW are exchanging sex with more men or more women or if condom use in these exchanges is associated with the biological sex of the sexual partner (19, 25, 125, 126). Several studies have examined the role of biological sex in HIV risk behavior among drug-using women who partner with male IDU (118, 127-129). Research suggests that male IDU are more likely to form sexual relationships with female non-injecting drug users as well as part of a calculated risk management strategy. These findings make it difficult to build and interpret an evidence base for understanding the role of biological sex in condom use behavior. Any such inquiry into the role of biological sex in the condom use practices of men may inform future work that explores male substance users' selective sexual risk-taking.

2.3 Summary of Substantive Knowledge and Gaps in Understanding Sexual Exchange as an HIV Risk Behavior

Among African American men, consistent correlates of selling sex include alcohol and drug use prior to or during sex or as a means of acquiring more substances (8, 10, 11, 13, 21, 126, 130, 131), having multiple lifetime sexual partners (10), male sexual partners (10, 21, 25, 125), unprotected sex including UAI (10, 126, 132), sexual partner concurrency (12), and various socioeconomic factors related to poverty. Jenness and colleagues found that men who sold sex were more likely to report regular non-injection drug use, have five or more sexual partners in the past year, and have male sexual partners (10). Numerous studies have found that African American MSMW are more likely than African American MSM to report recent sexual exchange (19, 25, 125, 126). For example, in an examination of sexual risk behavior among African American men, Spikes and colleagues describe how MSMW report more sexual exchange, IDU, drug use during the last sexual event, a greater number of lifetime sexual partners, unprotected sex with female primary partners, and primary partners of unknown HIV serostatus compared to MSM and MSW (132). Similarly, in a study

conducted in the Raleigh-Durham area of North Carolina, MSMW were more likely to exchange sex for drugs or money than MSM, and MSMW reported greater frequency of UAI with their female sexual partners when compared to MSW (126). MSMW who engaged in sexual exchange were more likely to be African American, report being homeless, and engage in recent IDU (21). In a study of predominantly African American MSM substance users, nearly two thirds engaged in sexual exchange. This risk behavior was associated with IDU, crack cocaine use, experience with childhood maltreatment, homelessness and non-gay identity (131). Additionally, a history of incarceration among women (10) and men (20, 21) is a consistent predictor of selling sex as is a history of homelessness among male drug users (10, 21, 131, 133). Women ages 30-39 that participated in a study by Jenness and colleagues (10) and men ≥35 years old included in the bivariate analysis from the Raleigh/Durham-based study (21) emerged as correlates of selling sex, although age has not been predictive in other studies (131). Among US women from a national survey, Dunkle and colleagues found that women with a high school education or less, an annual household income of less than $25,000, or who reported economic hardship were more likely to report selling sex. In this same study, African American women were four times more likely than their white counterparts to maintain casual exchange partnerships to meet economic needs (15). In another study of predominantly white MSM, younger age, straight or bisexual identification, and IDU were correlated with greater sexual exchange. The authors found that those who engaged in sexual exchange also reported a greater number of sexual partners and more frequent UAI with male and female sexual partners (22).

A substantial body of evidence describes individual-level attributes associated with HIV risk behavior. A growing body of work demonstrates the influence of peer and larger social networks on unsafe injection and condom behaviors. Limited research exploring the determinants of sexual

exchange has yet to determine how social conditions, social network composition and collective social support exert their effects. The present study intends to shed light on these mechanisms.

2.4 Interventions intended to reduce HIV behavioral risks among African American male substance users

There is extensive literature describing and evaluating behavioral interventions designed to reduce the infection and transmission of HIV among African Americans men. Many of these interventions seek to influence individual HIV-related behaviors. While formally evaluated behavioral interventions are highlighted, observations on community-based interventions and new perspectives on HIV prevention strategies that may impact behavioral norms introduce this section. Friedman and colleagues describe how a low-income, predominantly African American Brooklyn community used social network ties, communication, and social control through normative pressure to reduce the impact of drug use on the HIV epidemic and other health threats despite dissimilar values, interests and generalized mistrust (134). The authors explain that "intraventions" including health promoting communication, homegrown development of protective norms, and negotiations among various groups residing in the community continue despite the absence of shared values or trust (134). Dworkin et al. question the absence of gender theory in HIV prevention interventions designed for men in the US. The authors argue that gender-specific theories of female gender and power often undergird HIV prevention efforts for women, though theories of masculinity do not appear to guide many male-centered prevention efforts (135). Williams et al. describe the effectiveness of a culturally congruent HIV risk reduction intervention designed for African American MSMW. The authors note that most interventions neglect the historical, structural, and sociocultural determinants that impact prevention behaviors among African American MSMW. Known as Men of African American Legacy Empowering Self, the intervention incorporated these determinants, which resulted in an effective and sustainable intervention (136). Kimbrough and colleagues describe the Social Networks Demonstration Project, which accesses ethnic minority

social networks with a high proportion of individuals with unknown HIV infection (137). The intervention recruited 422 individuals LHWA across seven US cities who were asked to refer individuals from their social, sexual, or drug-using networks for HIV counseling and testing as well as care and prevention services. Over 3,000 peers received referrals and HIV prevalence was determined to be 5.6%, which was far greater that the approximate 1% prevalence that is estimated in CDC-funded counseling and testing sites (137). Broadhead et al. compared traditional outreach and peer-driven interventions (PDI) to reduce HIV transmission, and found that PDI was more effective at recruiting and engaging greater numbers of IDU and African Americans in health-promoting dialogue (138). In another study, Broadhead and colleagues examined a PDI's ability to increase predominantly African American drug users' adherence to HIV treatment and care (139). Over a six-month period, 14 active drug users assumed the role of peer health advocates and provided weekly support and counseling to encourage continued medical care and medication adherence. The authors found that this social support structure emboldened the men to assert positive social control that was influential in improving the health of themselves and their peers. Latkin et al. examined the outcomes of a network-oriented HIV prevention PDI among African American substance users living with or at risk of HIV infection. The intervention was grounded in pro-social roles and identity theory. Individuals were randomly assigned to a control condition or a small group, multi-session intervention that emphasized continued peer outreach. Over 90% of participants returned for follow-up, and those in the PDI experimental group were three times as likely to report adoption of safe injection practices and four times as likely to report more consistent condom use with non-primary partners (140).

2.5 Methodological Approaches To Understanding The Influence Of Social Networks On HIV Risk Behavior

"Network analysis is neither a method nor a metaphor, but a fundamental intellectual tool for the study of social structures (141)." Social network analysis (SNA) formalizes the study of

social influence, social support, and the patterns of infectious disease (99). For example, while many studies document the overall provision, receipt and perceived access to social support, most are egocentric in nature and, thus, fail to capture the function and composition of social networks. Furthermore, a distinction between egocentric and sociometric measurement approaches in studying the influence of social networks is often muddled in public health research (142). Egocentric studies query respondents (i.e., the ego) who are "located at the hub of a wheel, with the rim delineating his/her social contacts and the spokes the ties that connect them" (32). In contrast, sociometric studies observe and query the egos and as many of the nominated members of his/her social network who participate in the study (i.e., the alters contained within the respondent's personal network inventory). In egocentric studies, there is often an implicit assumption that all respondents will be influenced similarly by the predominant behavior of the overall social network. However, it is believed that social networks have "emergent properties" that cannot be explained by egocentric data and it is necessary to measure the ties between individuals and the kinds of ties within the overall social network to understand how individuals respond distinctively to their network of peers (32).

Three sampling approaches have been developed to study network influences on behavior: (1) *census methods* interview all members within a bounded network and ask each respondent for the names of their interaction partners (sociometric measures can be derived from these data); (2) *snowball methods* ask respondents to name the members of their networks and then interview all or a sample of these nominated individuals (sociometric measures may be derived from these data, though this is contingent on a sufficiently powered sample and the level of "boundedness" of the network); and (3) *personal network methods* ask respondents to name the members within their networks and then provide information on these individuals (124). Using these sampling methods, it is also possible to analyze simpler personal network structures, including the dyads within

egocentric networks. A dyadic analysis considers social relationships as the unit of analysis which may produce useful information about hard-to-reach populations engaging in stigmatized and/or illegal behaviors (115). As Rhodes and Quirk state, “such analyses are of practical importance because risk reduction is rarely the consequence of any one individuals' decisions or actions but is influenced by negotiated actions between individuals, as well as by wider social norms and values” (104). They explain that risk perceptions and risk behaviors are socially organized because of the significance and the values that individuals place on behaviors within social interactions. This, in turn, shapes how behaviors are negotiated and whether or not they are perceived as risky (60). Dyadic inquiry helps us understand how sexual risk behavior is a product of social relationships.

The present study used the second snowball sampling method described above. However, there was low participation of alters due to the study population and stigmatizing behaviors that were being studied as part of the survey. Therefore, for study Aim 2, the data were analyzed as if it were personal network methods. Therefore, throughout this dissertation, I refer to the respondents’ personal network rather than calling them social networks. I maximized the use of this data by also conducting dyadic analyses with sexual partner dyads.

CHAPTER 3. RESEARCH PARADIGM, THEORETICAL FRAMEWORK & CONCEPTUAL MODEL

3.1 PARENT STUDY OVERVIEW

3.1.1 Overview of SAMS for Aim 1

To achieve the first aim, which is exploratory in nature, I analyzed 16 semi-structured, in-depth interviews generated for SAMS. The principal investigator was Dr. Elizabeth Costenbader and the study was supported by grant number 10069 from the University of North Carolina at Chapel Hill Center for AIDS Research. The study occurred from 2007 to 2009 and data collection took place from 2007 to 2008 in two field sites, which included Raleigh (Wake County) and Durham (Durham County), North Carolina. The SAMS interviews were designed and conducted with male respondents as a qualitative follow-up to the SATH-CAP main study to explore the factors associated with the initiation and continuation of bisexual behavior among sexually active men at high risk for HIV acquisition and transmission. Positive expression and health-sustaining exploration of sexual behavior were beyond the scope of SAMS. Interviews explored respondents' sexual history, current sexual and substance-use behavior, incarceration history, and sexual identity.

The first study aim sought to elucidate how historic and present day social conditions experienced by the 16 African American SAMS respondents shape their HIV risk behaviors, with a special focus on the sale of sex for drugs or money. Three research questions guided the inductive content analysis of the transcripts generated from the 16 in-depth, semi-structured interviews.

3.1.2 Overview of SATH-CAP Network Study for Aims 2 and 3

To achieve study Aims 2 and 3, I analyzed data from the SATH-CAP network study. The SATH-CAP network study intended to fill current gaps in knowledge regarding the structure and basis of relationships between high-risk individuals and the organization of these relationships to be able to model HIV diffusion from drug-using to non-drug-using portions of the population. The principal investigator was Dr. William Zule and the study was supported by grant number U01da017373 from the National Institute of Drug Abuse. The study was conducted from 2005 to 2010 and data collection took place from 2007 to 2008 at two urban field sites in Raleigh (Wake County) and Durham (Durham County), and two rural field sites in Siler City (Chatham County) and Smithfield (Johnston County), North Carolina.

The SATH-CAP network study dataset consists of survey responses from 484 African American, white and Latino female and male respondents. To be eligible for participation, all respondents self-identified as active substance users. As described in Chapter One, I selected responses from the largest subset of respondents consisting of 201 African American men to address study Aim 2. Using egocentric data, I examined the relationship between the composition and social support function of the African American men's social networks and their sale of sex for drugs or money. For the third study aim, I converted the original subset of 201 responses to a dyadic dataset in order to examine the relationship between dyadic characteristics and unprotected sex among the same respondents and their sexual partners. The converted dataset contained 229 observations.

The behavioral outcome variables from the SATH-CAP network study dataset are modeled for the African American male respondents. The two outcome variables include: (1) the *sale of sex for drugs or money* to any man or woman in the past six months; and (2) *unprotected sex* to nominated male and female sexual partners in the past six months. These two behavioral outcomes

are the most proximal behavioral determinants in the present study's conceptual model due to their empirical association with sexual risk behavior associated with HIV and other STI acquisition and transmission.

3.2 Mixed Methods As A Pragmatic Research Paradigm

Mixed methods have been defined in several ways within the social and behavioral sciences. Tashakkori and Creswell distinguish between mixed methods as a collection and analysis of qualitative and quantitative data, and the more challenging integration of two epistemological approaches to research in order to draw a cohesive set of inferences (143). A paradigm of pragmatism is often invoked, though this may prove vexing to those who question whether different scientific paradigms can be mixed at any stage of the inquiry and interpretation of findings (144). This pragmatic approach to using mixed methods can be mutually illuminating while recognizing that the epistemological and ontological opposition of positivist and interpretive perspectives may at times be at odds. The intention of the mixed methods dissertation is to draw from the strengths and minimize the limitations of quantitative and quantitative inquiry in order to better understand the social forces driving sexual risk behavior among African American male substance users (see Table 3.1). The qualitative and quantitative data are equally prioritized in that the dissertation does not privilege the deductive quantitative hypotheses contained in study Aim 2 and Aim 3 over the inductive thematic analysis completed for study Aim 1. As Bourgois states, "to create pragmatic interventions, public health has to rise to the theoretical and logistical challenges of cross-methodological dialogue and engage with the social power categories that tend to be erased by epidemiology's focus on quantifiable micro-practices rather than larger 'webs of causation'" (119). More specifically, mixing qualitative and network-based data is appropriate for answering the aims of the study. SNA is capable of mapping the social processes that drive individual behavior and qualitative inquiry is well equipped to understand the 'how' and 'why' of social

processes, making them logical companions. Remarking on the natural fit of the two datasets for my dissertation, Tom Valente, a leader in the field of SNA in public health, stated that "SNA is quantitative ethnography! (145)

Table 3.1 Strengths and limitations of quantitative and qualitative inquiry

	Quantitative	Qualitative
Strengths	• testing hypotheses • eliminating confounding • generalizing findings	• data are given meaning by respondents • can describe respondents' experiences of phenomena • responsive to local situations
Limitations	• may not address context of findings • may miss out on important phenomena	• cannot make predictions • time-consuming to collect and analyze

Source: Adapted from Johnson and Onwuegbuzie (146)

A mixed methods approach is valued for its potential to triangulate data in order to arrive at *convergence* or *confirmation* across findings. There are additional motivations, which include: (1) complementarity, which "seeks elaboration, enhancement, illustration, clarification of the results from one method with the results from another"; (2) initiation, which seeks "the discovery of paradox and contradiction, new perspectives of [sic] frameworks, the recasting of questions or results from one method with questions or results from the other method"; and (3) expansion, which "seeks to extend the breadth and range of enquiry by using different methods for different inquiry components"(147, 148).

3.3 THEORETICAL FRAMEWORK

3.3.1 Theoretical Framework for Aim 1

Link and Phelan's theory of social conditions as fundamental sources of health inequities informed the exploration of social conditions that shape study participants' intersecting sexual and substance-using norms and behaviors (149, 150). They argued that health disparities persist in spite

of changing proximal risk factors because socioeconomic status is associated with differential access to "money, knowledge, prestige, power, and beneficial social connections" as well as exposure to stressful environments, harmful products, and reservoirs of infection (150). Furthermore, Link and Phelan contended that attempts at reducing *risk behavior* may be unsuccessful if the pathways to *risk exposure* are not understood. That is, efforts to reduce risk behaviors among African American MSMW may be unsuccessful if the pathways to sexual and substance-use risk exposures are not understood (150).

A second theoretical foundation that informed this study aim comes from the work of Scheper-Hughes and Bourgois. Their *Continuum of Violence* framework includes theoretical constructs that align with the study's orientation toward social conditions as fundamental sources of health inequities. Specifically, Scheper-Hughes and Bourgois posited that political, structural and symbolic experiences of violence manifest in everyday "practices and expressions of violence on a micro-interactional level" (151). These expressions can be understood as assaults to one's personhood and dignity through various forms of interpersonal and intrapersonal violence. The application of this framework to the present study could help expose the historical context and modern-day social conditions, such as persistent poverty, paralyzing incarceration, and chronic unemployment that shape African American, substance-using MSMW's sexual risk behaviors and daily health challenges.

Lastly, Whitehead's work on how men are socialized to construct their ideal masculinity and sense of self by cultivating respect and reputation though economic capacity, sociopolitical power and sexual prowess informed this study aim (152). In his work with African American men, Whitehead argued that too often the only avenue for structurally vulnerable men is to affirm their masculine identity by cultivating their reputation and exercising their sexual prowess (152). This is consistent with Courtenay's assertions "that health behaviors are used in daily interactions in the

social structuring of gender and power" and that the "behaviors that undermine men's health are often signifiers of masculinity and instruments that men use in the negotiation of social power and status" (153).

3.3.2 Theoretical Framework for Aim 2

3.3.2.1 Composition of Personal Networks

Social Influence Network Theory informed the focus on the composition of social networks as influential on the sale of sex for drugs or money (154). Social networks can be a place of conflict since prevailing norms are tested and social control is exercised. The theory recognizes the role of social control within sub-groups that may detour from larger processes of normative integration. Social networks are also the context in which social support is derived, resources are exchanged, behaviors are learned, and social identities and roles are formed (142).

3.3.2.2 Social Support Function of Personal Networks

Social support is characterized as the cognitive appraisal of feeling reliably connected to others and benefitting from individual and community-level resources that buffer the effect of stressors (155, 156). The social support function of the respondents' social networks was measured using House's taxonomy of emotional, instrumental, or informational support, in general, and appraisal support regarding discontinuation of respond drug use. This cohesive set of social support concepts is understood to act as antecedents to health-promoting behaviors and favorable health outcomes (156, 157). There is also evidence that negative interpersonal interactions, such as those characterized by mistrust and antagonism are more strongly related to psychiatric morbidity (158) and substance abuse (159) than is an absence of social support. Israel and colleagues suggest that these negative interactions occur independently of levels of social support (160). Furthermore, receipt of social support is associated with a sense trust, reciprocity, and obligation that may complicate shared behaviors, such as injection drug and condom use (116, 118, 119, 123, 161). This

approach to examining social support is intended to inform future LHA interventions that may be tailored to meet different needs including social contact, a sense of belonging, approval, care, and safety (34) (see Table 3.2) .

Table 3.2 Definition of four forms of social support

Emotional Support	Expressions of empathy, love, trust, and caring
Instrumental Support	Tangible aid and services
Informational Support	Advice, suggestions, and information
Appraisal Support	Information that is useful for self-evaluation of behavior

Source: House, et al. (157)

3.3.3 Theoretical Framework for Aim 3

3.3.3.1 Influence of Sexual Partner Dyad Characteristics on Unprotected Sex

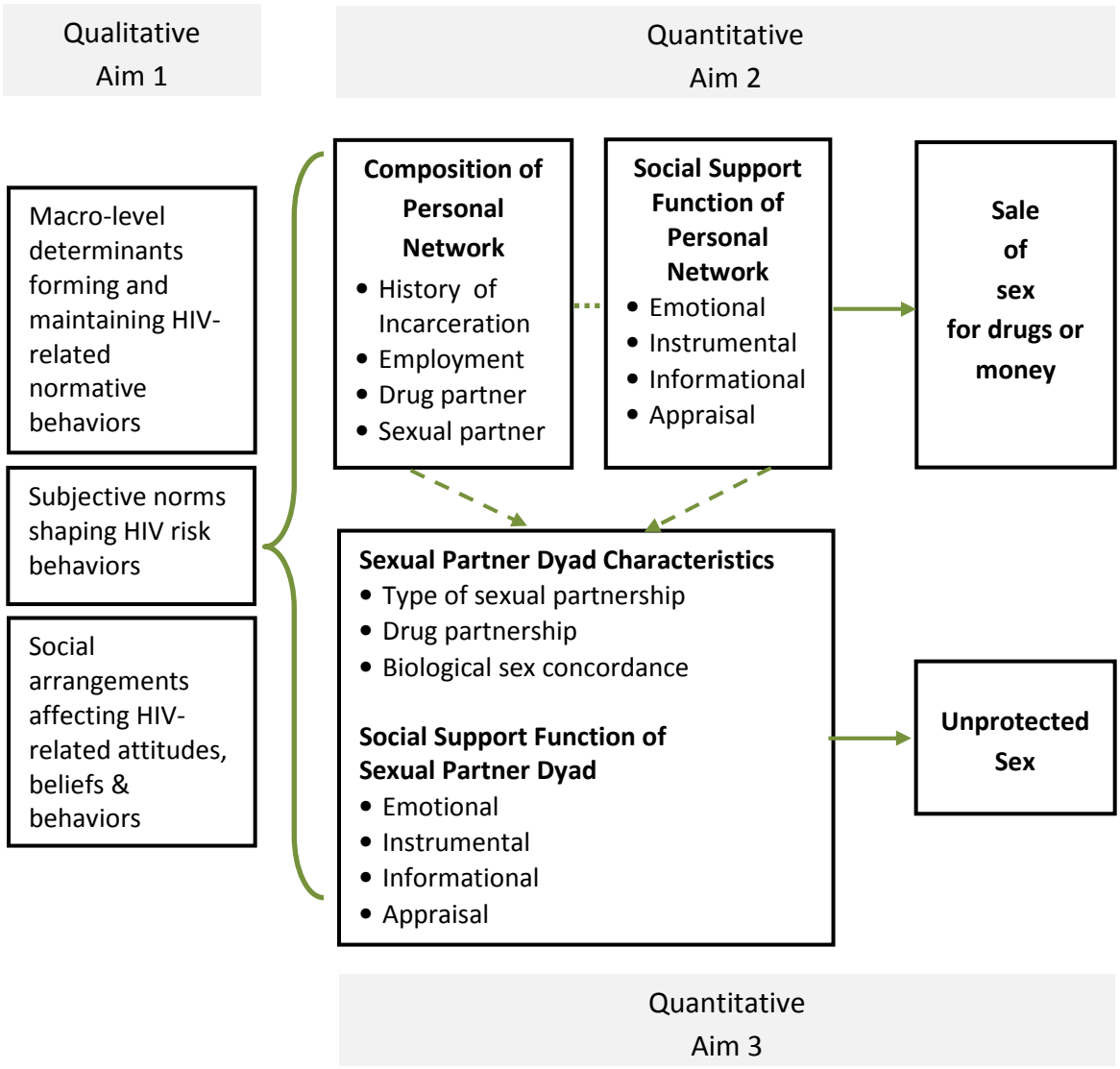
Interdependence Theory informed the inclusion of characterization of sexual partner dyads. Interdependence Theory examines how the characteristics and shared experiences of individuals within a dyad influence their patterns of behavior. The basic premise of this theory is that the perceptions, assumptions or goals of the dyad in a given situation determine how a dyad will interact and behave (162). There is limited evidence that clarifies how dyadic characteristics of African American male substance users and their sexual partners influence sexual risk behavior, including unprotected sex. To our knowledge, no studies have examined this specific inquiry.

3.4 Conceptual Model

The conceptual model illustrates the guiding research questions for study Aim 1 and the relationships between the explanatory variables and the behavioral outcomes for Aim 2 and Aim 3 (see Figure 3.1). The explanatory variables included in the conceptual model are detailed in chapter four (see Tables 4.1-4.3). The SAMS data (used for Aim 1) were collected simultaneously with the SATH-CAP network study data (used for Aims 2 and 3) as a follow-up to the SATH-CAP main study.

However, in the conceptual model, the first study aim is placed to the left of the quantitative explanatory variables which may be confused as chronologically preceding the SATH-CAP network data collection. Rather, study Aim 1 was conceptualized as providing insight into the broader landscape believed to inform the social network composition, social support function, and sexual partner dyadic characteristics, which may in turn, influence the sale of sex for drugs or money and unprotected sex among African American male substance users.

Figure 3.1 Conceptual model for Aims 1, 2 and 3



3.5 Study Aims, Research Questions & Hypotheses

Aim 1: To explore how social conditions shape the sexual and drug-using norms and behaviors of African American men at risk of HIV acquisition and transmission.

Research Question 1.1	What macro-level determinants form and maintain the sexual risk normative behaviors described by the respondents?
Research Question 1.2	What sexual and substance-using subjective norms shape the HIV risk behaviors, including sexual exchange, described by the respondents?
Research Question 1.3	What patterned social arrangements shape the knowledge, attitudes, beliefs and HIV risk behaviors of the respondents?
Research Question 1.4	What are the demographic characteristics and sexual risk behaviors of the study population?

Aim 2: To test the strength of the relationship between the composition and social support function of the African American male respondents' personal networks and their sale of sex for drugs or money.

Composition of Social Network:

Research Question 2.1	To what extent is the composition of African American male respondents' personal networks associated with the reported sale of sex for drugs or money?
Hypothesis 2.1a	African American male respondents with a higher proportion of network alters with a history of incarceration are more likely to report selling sex for drugs or money than African American male respondents with a lower proportion of network alters with a history of incarceration.
Hypotheses 2.1b	African American male respondents with a lower proportion of network alters who are employed are more likely to report selling sex for drugs or money than African American male respondents with a higher proportion of network alters who are employed.

Hypothesis 2.1c	African American male respondents with a higher proportion of network alters with whom they have shared drugs in the past six months are more likely to report selling sex for drugs or money than African American male respondents with a lower proportion of network alters with whom they have shared drugs in the past six months.
Hypothesis 2.1d	African American male respondents with a higher proportion of network alters with whom they have had sex in the past six months are more likely to report selling sex for drugs or money than African American male respondents with a lower proportion of network alters with whom they have had sex in the past six months.

Social Support Function of Personal Network:

Research Question 2.2	To what extent is the social support function of the African American males' personal networks associated with the reported sale of sex for drugs or money?
Hypothesis 2.2a	African American male respondents with a lower proportion of perceived emotional support from network alters are more likely to report selling sex for drugs or money than African American male respondents with a higher proportion of perceived emotional support from network alters.
Hypothesis 2.2b	African American male respondents with a lower proportion of perceived instrumental support from network alters are more likely to report selling sex for drugs or money than African American male respondents with a higher proportion of perceived instrumental support from network alters.
Hypothesis 2.2c	African American male respondents with a lower proportion of perceived informational support from network alters are more likely to report selling sex for drugs or money than African American male respondents with a higher proportion of perceived informational support from network alters.

Hypothesis 2.2d	African American male respondents with a lower proportion of perceived appraisal support regarding the discontinuation of their drug use from network alters are more likely to report selling sex for drugs or money than African American male respondents with a higher proportion of perceived appraisal support regarding the discontinuation of their drug use from network alters.

Aim 3: To examine the relationship between dyad characteristics, social support function and unprotected sex among the African American male respondents' and their nominated sexual partners.

Sub-Aim 3: Analytical Research Questions to Test Hypotheses

Research Question 3.1	To what extent is the type of sexual partnership within sexual partner dyads associated with reported unprotected sex?
Hypothesis 3.1a	African American male respondents who describe their nominated sexual partners as primary sexual partners are more likely to report unprotected sex than African American male respondents who describe their nominated sexual partners as non-primary sexual partners.
Research Question 3.2	To what extent is drug use within sexual partner dyads associated with reported unprotected sex?
Hypothesis 3.2a	African American male respondents who use drugs with their nominated sexual partners are more likely to report unprotected sex than African American male respondents who do not use drugs with their nominated sexual partners.
Research Question 3.3	To what extent is the social support received from nominated sexual partners associated with reported unprotected sex within sexual partner dyads?
Hypothesis 3.3a	African American male respondents who consider their nominated sexual partners as a source of emotional support are more likely to report unprotected sex with these sexual partners than African American males who do not describe their sexual partners as a source of emotional support.

Hypothesis 3.3b	African American male respondents who consider their nominated sexual partners as a source of instrumental support are more likely to report unprotected sex with these sexual partners than African American males who do not describe their sexual partners as a source of instrumental support.
Hypothesis 3.3c	African American male respondents who consider their nominated sexual partners as a source of informational support are more likely to report unprotected sex with these sexual partners than African American males who do not describe their sexual partners as a source of informational support.
Hypothesis 3.3d	African American male respondents who consider their nominated sexual partners as a source of appraisal support regarding discontinuation of respondent drug use are more likely to report unprotected sex with these sexual partners than African American males who do not describe their sexual partners as a source of appraisal support regarding discontinuation of respondent drug use

Sub-Aim 3: Exploratory Question to Generate Future Hypotheses

Research Question 3.4	To what extent is biological sex concordance within a sexual partner dyad associated with reported unprotected sex?

CHAPTER 4. METHODS

4.1 SAMPLING STRATEGIES FOR THE PARENT STUDY

4.1.1 Sampling Strategy for SAMS for Aim 1

The SAMS study employed a non-probability sampling approach called purposive sampling where respondents were selected for their knowledge of, and experience with issues of fundamental importance to the research questions (163). As the nature of the original study was to understand pathways to sexual risk behavior, every effort was made to involve respondents with a wide range of activities and social backgrounds. This approach is not to be confused with the more formalized theoretical sampling utilized in grounded theory (164).

4.1.2 Sampling Strategy for SATH-CAP Network Study for Aims 2 and 3

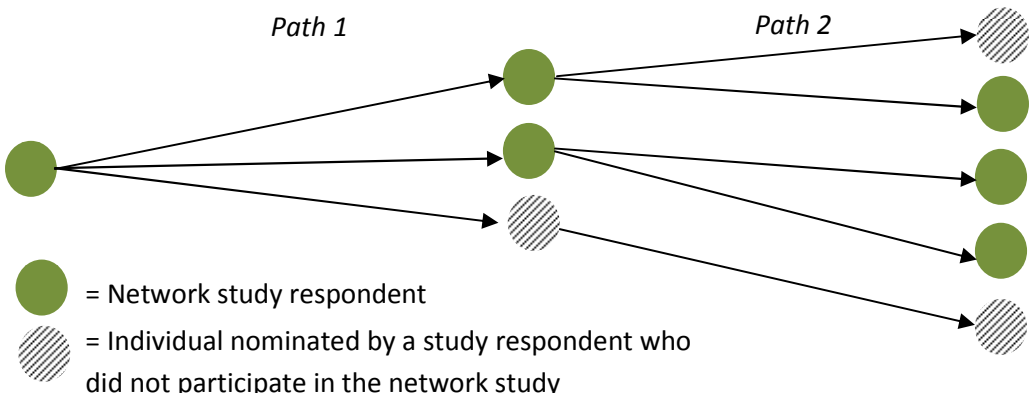
The SATH-CAP network study seed respondents were a subset of individuals who were already enrolled in the main SATH-CAP study. The main study respondents were recruited and connected via respondent driven sampling (RDS). The main study eligibility criteria varied by behavioral risk group, which included substance use in the past six months, anal sex with a man in the past six months, or sexual partnership with the respondent-turned-recruiter in the past six months. Substance users had to report heroin, powder cocaine, crack cocaine, methamphetamine or injection drug use during this time period to be eligible.

Main study respondents having characteristics associated with HIV risk were identified, selected, and recruited to participate in the network study. These characteristics included the results of the HIV and STI lab tests, biological sex, race/ethnicity, age, county of residence, sexual

Activity, and substance use behavior. Forty-five network seeds were selected at random after identification from the RDS-based main study and snowball sampling were employed to populate the network study sample. The study team enrolled roughly one-fifth of all network respondents from the main study. Higher recruitment rates for the main study were anticipated in the two urban sites than in the two rural sites. Therefore, sub-networks were over-sampled at the two rural sites relative to the two urban sites.

Study recruitment and enrollment continued as a two-step path from the seed respondents. Specifically, each seed respondent could nominate up to 24 individuals into their personal network inventories. Using an incentive-based coupon system, nominees were then invited by the seed respondent to participate in the network study as the first wave. First wave respondents could nominate up to 24 individuals into their personal network inventories for subsequent recruitment and second wave respondents could nominate, but not recruit, up to 24 individuals into their personal network inventories. These efforts resulted in survey responses from 484 male and female respondents from African American, Latino and white racial/ethnic backgrounds. Survey responses were selected from the largest subset of respondents consisting of 201 African American male seeds, first wave, and second wave respondents.

Figure 4.1 Example of SATH-CAP network study sampling process resulting in a seed chain



4.2 Data Collection for the Parent Study

4.2.1 Data Collection for SAMS for Aim 1

For the parent study, three female interviewers were trained to administer a brief quantitative survey containing demographic and HIV risk factor items, and a semi-structured interview guide. Questions from the interview guide explored the following topics with each participant: (1) dynamics and characteristics of current main sex partner(s); (2) dynamics and characteristics of current non-main sex partner(s); (3) sexual identity; (4) first sexual experience with a woman; (5) first sexual experience with a man; (6) differences in sexual experiences and relationships with men and women; (7) current drug use and risk behaviors; (8) sexual exchange for drugs or money; (9) history of coercive sex; (10) history of incarceration; and (11) recruitment of other men who have sex with men and women (see Table 4.4. and Appendix B: SAMS Demographic & Sexual Risk Behavior Survey) .

The surveys and interviews occurred in private rooms in multiple locations approved for safety and appropriateness by the PI. The interviews lasted approximately 60 minutes, were audio-recorded, and transcribed verbatim. Respondents were compensated for participating in the study and the reimbursement amount was specified in the informed consent form. The internal review board (IRB) from RTI, International and FHI (now FHI 360) approved the parent study and the IRB at the University of North Carolina at Chapel Hill approved the secondary data analysis for this study.

4.2.2 Data Collection for SATH-CAP Network Study for Aims 2 and 3

Study staff used computer-assisted personal interviews to complete the personal network inventories with the respondents. The respondents then used audio computer-assisted self-interviewing (ACASI) to report their own demographic characteristics, sexual and substance use behaviors, and characteristics of and behaviors with their nominated alters. The desktop computers had touch screen technology and the survey was formatted with check box answer options,

requiring minimal literacy. The survey was approximately 45 minutes in length, depending on the number of peers nominated into the respondents' personal network inventories. The survey responses were entered into the computer at the time of interview. Therefore, the data were saved as electronic files on the laptop computers and later transferred to a secured server at RTI. Members of the study team were available to provide assistance and quality assurance before and while the respondents completed the survey. Potential respondents who were assessed as too intoxicated to participate were rescheduled for a later date.

The network study surveys were completed at the each of the existing SATH-CAP main study RTI field sites in private rooms during regular operating hours. For those who participated in the main study, an effort was made to schedule the network study surveys to coincide with times when individuals were returning to the RTI field site to obtain their test results or to collect compensation for coupons redeemed for the main study.

Written informed consent was obtained from each respondent prior to study enrollment. Respondents were compensated for participating in the study and for successful recruitment and participation of nominated peers into the network study. The IRB of RTI approved the network study and the IRB at the University of North Carolina at Chapel Hill approved this secondary data analysis. RTI also acquired a certificate of confidentiality for the study.

4.3 Recruitment & Eligibility Criteria for the Parent Study

4.3.1 Recruitment & Eligibility Criteria for SAMS for Aim 1

The SAMS study selected men who met the following eligibility criteria: (a) were of 18 to 55 years of age; (b) ability and willingness to provide written informed consent to participate in the study; (c) reported having sex with a man and a woman in the past six months; and (d) reported high-risk sexual activity. This final criterion was defined as meeting one or more of the following: (a) on average, having three heterosexual sex acts per week over the past month; (b) having three or

more different sexual partners in the previous month; or (c) having sex with an injection drug user or sex worker in the past six months (163). Recruitment materials were posted at two public libraries and distributed at two study sites, a criminal justice resource center and a county-sponsored emergency and transitional shelter for homeless men. These materials encouraged men to call a study telephone line if they were able to respond in the affirmative to the following intentionally vague questions: (a) Are you a sexually-active man between the ages of 18 and 55? (b) Have you had more than one sexual partner in the past six months? (c) Do you know men who have sex with men and women? And (d) Are you willing to share your experiences in a confidential interview?

4.3.2 Recruitment and Eligibility Criteria for SATH-CAP Network Study for Aims 2 and 3

The recruitment strategy and eligibility criteria used for the network study were previously described as part of the snowball sampling strategy in section 4.1.2. As in most network studies, sampling approaches are inextricably tied to the recruitment process. Section 4.1.2 describes how RDS methods were used in the main study which led to the subsequent identification of 45 seed respondents for the network study. The PI and study team recognized the benefits to recruiting network study respondents from individuals already participating in the SATH-CAP main study in that it minimized recruitment costs as well as additional expenses with regard to staffing or infrastructure. Seventeen of the 45 seeds were African American males. The African American male seeds and first and second wave respondents nominated a mean of 3.95 individuals into their personal network inventories. A mean of 1.62 individuals were identified as sexual partners within the personal network inventories.

4.4. STUDY SAMPLE

4.4.1 Study Sample for Aim 1

Study Aim 1 was geared toward understanding how social conditions shape sexual risk norms and behaviors of structurally vulnerable African American men who report high-risk sexual behaviors. As a result of recruitment and screening efforts, 20 men participated in the study, all of whom reported substance use. Two interviews were not transcribed due to poor audio recordings. Additionally, two interviews were dropped from the analysis due to distinct social experiences from the 16 African American men who participated in the study. One interview was completed with a Puerto Rican man who identified himself as a professional sex worker and another interview was completed with a white man. The present study comprised an analysis of de-identified transcripts and brief surveys completed with 16 African American respondents.

4.4.2 Study Sample for Aim 2

Study Aim 2 tested the strength of relationship between composition and social support function of the personal networks of African American male respondents and their sale of sex for drugs or money. The study sample for this study aim was answered by using the egocentric data from the 201 African American male respondents, all of whom were active substance-users to qualify and participate in the SATH-CAP network study. As described earlier, the network study data consists of survey responses from 484 male and female respondents of different racial/ethnic backgrounds. There are a total of 201 African American men within this larger dataset. These 201 observations come from seed, first wave, and second wave African American male respondents. The SATH-CAP network study respondents were queried on the perceived characteristics of their alters, as well as their perceptions as to whether or not their alters were a source of social support.

4.4.3 Study Sample for Aim 3

For the third study aim, responses from the 201 African American male respondents were converted to a dyadic dataset so that each observation represented the respondent and survey items for each alter who was identified as a sexual partner, which resulted in 229 sexual partner dyad observations.

4.5 Domains of Inquiry and Measures

4.5.1 Domains of Inquiry for Aim 1

Each semi-structured in-depth interview contains the following domains of inquiry: (1) current main sexual partner(s), (2) current non-main sexual partner(s), (3) sexual identity, (4) first sexual experience with a woman, (5) first sexual experience with a man, (6) differences in sexual experiences and relationships with men and women, (7) current drug use and risk behaviors, (8) sexual exchange (purchased or sold) for drugs or money (9) history of coercive sex, (10) history of incarceration, and (11) connections and recruitment of men who have sex with men and women (see Appendix A: SAMS Semi-Structured Interview Guide) . The respondents also completed a brief survey with demographic and sexual risk behavior items (see Appendix B: SAMS Demographic & Sexual Risk Behavior Survey).

4.5.2 Measures for Aim2

The SATH-CAP network survey instrument was developed using questions previously employed in several different studies of the social and risk networks of individuals residing in high-risk populations (11, 99, 110, 165) (see Appendix C: SATH-CAP Network Study Non-Repeating Survey Instrument). The SATH-CAP network study used the snowball recruitment method. However, due to the sample size and unbounded nature of the study population, sociometric measures are not reliable and therefore were be included in statistical models for the study.

4.5.2.1 Outcome Variable for Aim 2

The outcome variable, sale of sex for drugs or money, was measured and analyzed dichotomously. This primary outcome variable was asked in a general manner and not for each nominated sexual partner. Therefore the biological sex of the sexual exchange partner could not be assessed for this analysis (see Table 4.8 for more detail).

4.5.2.2 Explanatory Variables for Aim 2

4.5.2.2.1 Personal Network Composition

As part of the personal network inventories, the respondents were queried on several demographic and behavioral items for each alter to understand the composition of the respondents' personal networks. The four items that assessed the social network composition for this the second study aim are documented correlates of selling sex for drugs or money (see Table 4.1). All explanatory variables were chosen that represented both HIV protective and risk-related factors. The respondents' history of incarceration was controlled for statistically, rather than modeled as a predictor for the *sale of sex for drugs or money*, because of its well-documented association with individual-level and partner-level HIV risk behaviors and infection (50). However, the relationship between HIV risk behavior, including sexual exchange, and the proportion of alters with a history of incarceration has not been empirically tested and thus was included as an explanatory variable.

Table 4.1 Personal network composition explanatory variables for Aim 2

Variable	Measurement Approach	Item	Type
History of Incarceration	Proportion of alters who are perceived to have a history of incarceration	Please indicate if there is anyone on this list who has been in prison or jail	Categorical: Dichotomous
Employment	Proportion of alters who are perceived to have part-time or full time employment	Is there anyone on this list who works full-time? *and* Is there anyone on this list who works part-time?	Categorical: Dichotomous
Drug partner	Proportion of drug-using partners in the past 6 months	In the past 6 months, who on this list of people have you done drugs with?	Categorical: Dichotomous
Sexual partner	Proportion of sexual partners in the past 6 months	In the past 6 months, who on this list of people have you had sex with?	Categorical: Dichotomous

Proportions were calculated for the number of alters who possessed the four compositional characteristics over the total number of alters in the respondents' personal network inventories. The calculated proportions were then treated as continuous variables for the study Aim 2 analyses. As described in chapter three, measuring the proportion of HIV protective and risk-related compositional characteristics is a proxy for understanding the prevailing sexual exchange norms present in the respondents' personal networks. The network study survey instrument did not contain any items that explicitly measured subjective norms regarding the sale of sex for drugs or money.

I used proportions, rather than count variables, as the proportion variables were more robust and I believe proportions are a better proxy measure to understand prevailing norms. I conducted a sensitivity analysis to test the effect of the explanatory variables on the Aim 2 outcome variable using the explanatory variables in count format and also in a composite format (see Appendix D: Aim 2 Explanatory Variables in Count Format, Table 4.15 and Appendix E: Aim 2 Explanatory Variables in Composite Format, Tables 4.16 and 4.17). The transformation of the

explanatory variables into a composite format was an attempt to account for the relationship between proportions and number of alters (e.g., a greater proportion of drug partners among respondents with a smaller group of alters). In this example, one could encounter an inverse relationship between proportion and number of alters. It was reasoned that a composite variable could be a theoretically more grounded way of measuring the influence of alter attributes within personal networks. This measurement approach is not present in the literature. However, using explanatory variables in the composite format was not pursued as the main Aim 2 analysis due to weak performance and its nascent stage of development. The composite groups were transformed and categorized in the following way:

(1) greater than median size of personal network inventory AND greater than median proportion with this predictor attribute

(2) greater than median size of s personal network inventory AND lesser than median proportion with this predictor attribute

(3) lesser than median size of s personal network inventory AND greater than median proportion with this predictor attribute

(4) lesser than median size of personal network inventory AND lesser than median proportion with this predictor attribute

4.5.2.2.2 Social Support Function of Personal Networks

Egocentric social support studies are generally designed to examine one dyadic relationship at a time or to broadly gauge the provision and receipt of social support within a respondent's social network or a particular set of peers such as drug or sexual partners. In the same fashion as the composition variables described above, in the network study, respondents were queried on specific social support items for each alter as part of their personal network inventories. As a result, I measured the proportion of alters, for each respondent, who are a reported sources of emotional,

instrumental, and informational support, in general, and appraisal support regarding discontinuation of respondent drug use (see Table 4.2). The emotional support variable was measured using a scale from one to ten where one signified 'not close at all' and ten as 'the closest'. A mean score was then calculated based on the scores given for each of the respondents' peers. The mean score was treated as a continuous variable for analysis. With the exception of emotional support, social support variables were also measured dichotomously and proportions were calculated in the same manner. The calculated proportions were then treated as continuous variables for analysis.

Table 4.2 Social support function explanatory variables for Aims 2 and 3

Variable	Measurement Approach	Item	Type
Emotional support	Mean score of alters' emotional support	On a scale of 1 to 10, how close are you to [alter 1-24], with 1 as 'not close at all' and 10 as 'the closest'?	Continuous/ Interval
Instrumental support	Proportion of alters as source of instrumental support	Is there anyone on the list who would give up some of their time and energy to help you, things like going to places, helping you do some work around the house, going to the store for you, and other things like this?	Categorical: Dichotomous
Informational support	Proportion of alters as source of informational support	If you wanted to talk to someone about private and personal things or you need advice, is there anyone from the list you provided so far that you can talk to?	Categorical: Dichotomous
Appraisal support	Proportion of alters as source of appraisal support regarding the discontinuation of respondent drug use	Have any of these people ever encouraged you to stop using drugs?	Categorical: Dichotomous

4.5.3 Measures for Aim 3

4.5.3.1 Outcome Variable for Aim 3

The outcome variable, unprotected sex, was measured and analyzed dichotomously for the respondents in relation to each of their nominated sexual partners with whom they had been sexually active in the past six months. A distinction between unprotected anal and vaginal sex was not measured. While UAI may be a more efficient route of HIV transmission, co-infection with an STI greatly increases the efficiency of HIV infection during vaginal sex (166). Additionally, among high risk populations, there is empirical evidence demonstrating UAI regardless of the biological sex of the sexual partner (10, 19, 103, 126)

4.5.3.2 Explanatory Variables for Aim 3

4.5.3.2.2 Type of Sexual Partnership

The type of sexual partnership was hypothesized as a potential risk factor for unprotected sex within the sexual partner dyads. Primary sexual partnership has been associated with no or inconsistent condom use, as negotiating condom use within primary sexual partnerships is often considered a violation of trust and a disruption of intimacy (161). Type of sexual partnership was measured from the respondents' perspective and was not confirmed by the nominated sexual partners due to the limited participation of alters in the study. Any nominated sexual partner described as a main partner, girlfriend, boyfriend or spouse was considered a primary sexual partner and all other types of relationships were considered as 'other'. Therefore, this variable was treated as a dichotomously.

4.5.3.2.3 Drug Partnership

Drug partnership was hypothesized as a potential risk factor for unprotected sex. Drug use among sexual partners has been associated with no or inconsistent condom use. Drug partnership was measured from the respondents' perspective. Shared drug use was not confirmed by the

nominated sexual partners due to the limited participation of alters in the study. Any nominated sexual partner described as using drugs with a respondent within the past six months was considered a drug partner and all other nominated sexual partners were considered as 'non-drug.' Therefore, this variable was treated as a dichotomous variable for the study Aim 3 analyses.

4.5.3.2.4 Biological Sex Concordance

There is little empirical evidence demonstrating the role of biological sex of sexual partners in condom use behavior. None of the respondents identified as transgender nor were any of the sexual partners described as transgender. Therefore, biological sex concordance between respondents and their sexual partners were treated dichotomously as male (concordant) or female (discordant) for the study Aim 3 analyses.

4.5.3.2.1 Social Support Function

The same four social support variables from the study Aim 2 were modeled as predictors in the dyadic analyses. For each nominated sexual partner, the respondent provided an emotional support score and dichotomous responses for the three other social support items. The emotional support variable was measured using a scale from one to ten and treated as continuous for analysis. The three other social support variables were measured dichotomously. Responses to the social support variables were not confirmed by the nominated sexual partners due to limited participation of nominated peers in the study.

Table 4.3 Sexual partner dyad characteristic explanatory variables for Aim 3

Variable	Measurement Approach	Item	Type
Type of sexual partnership	Primary (i.e. main, girlfriend, boyfriend, spouse) or other	What is [alter]'s relationship to you?	Categorical: Dichotomous
Drug partnership	Drug use behavior with nominated sexual partner in the past 6 months, or non-drug partner	In the past 6 months, who on this list of people have you done drugs with?	Categorical: Dichotomous
Biological sex concordance	Concordant: Respondent is male/ Nominated sexual partner is male Discordant: Respondent is male/ Nominated sexual partner is female	Are you biologically? *and* Of the people on this list, please indicate which individuals are male? *and* Were any of the sex partners that you named also male?	Categorical: Dichotomous

4.6 DATA MANAGEMENT

4.6.1 Management of SAMS Data for Aim 1

The audio-recorded interviews were transcribed verbatim to individual Microsoft Word documents and then assigned to ATLAS.ti, v. 6.2, to conduct an inductive thematic analysis (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). Answers to the brief quantitative survey were recorded on paper-based surveys and later transferred to a secured Excel document by the SAMS study team. Careful attention was taken by the PI to redact all personal identifying information from the interview transcripts before granting access for secondary analysis.

4.6.2 Management of SATH-CAP Network Study Data for Aim 2 and Aim 3

Data from the completed SATH-CAP network study surveys were downloaded to password protected files at the end of each day of data collection in a format compatible for analysis using SAS, version 9.3 (SAS Institute Incorporated, Cary, North Carolina) and PASW Statistics version 18.0 (SPSS: An IBM Company). Data entry was unnecessary, as survey responses were entered directly into data fields during the completion of the survey. Logic checks were programmed into the

survey which reduced the likelihood of entering nonsensical values. Careful attention was taken by the PI to de-identify the survey data before granting access for secondary analysis.

4.7 DATA ANALYSIS

4.7.1 Data Analysis for Aim 1

An inductive thematic analysis of the secondary data began with reading the 16 interview transcripts and a careful mapping of the interview guide, which resulted in a codebook containing detailed descriptions and rules of assignment for each code. Structural codes were first developed to broadly index the text representing the domains of inquiry contained in the interview guide as well as demographic and participant characteristics (167, 168). Topical codes were developed to map the specific questions and probes articulated within each domain (167, 168). After an initial reading and coding of the 16 interviews transcripts, new structural codes were created to represent additional dimensions contained within the original domains. In particular, the domains of (3) sexual identity, (7) current drug use and risk behaviors, (8) sexual exchange for drugs or money, and (10) history of incarceration were expanded. Additional topical codes were developed to capture common probes not contained in the interview guide as well as common participant responses. As part of the second reading of the interview transcripts, the finalized structural and topical codes were assigned to the text. ATLAS.ti v.6.2 was used to code the interview transcripts.

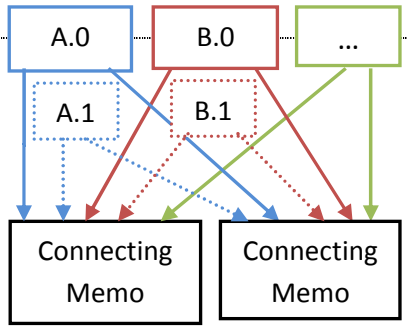
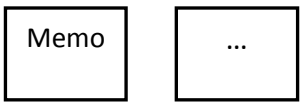
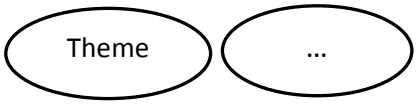
Throughout the reading and coding process, memos were written to assess code suitability, examine the influence of interviewer-participant interaction, and reflexively examine the influence of researcher subjectivity on the construction of meanings (169). Additionally, memos documenting overarching emergent themes were written throughout this process and assisted in moving the results beyond a descriptive summary of the interviews. To further explore and substantiate emergent themes, code reports were generated for each code and, for various intersections of codes, within and across the coded interview transcripts using ATLAS.ti v.6.2. Quotations within

these code reports were noted for differences among participants (170). Quotations were then selected that most clearly illustrated the emergent themes and represented a majority of the participants' voices (171, 172). Lastly, all selected quotations were highlighted in the original interview transcripts and reread in their entirety. These measures were taken to ensure that the quotations were not interpreted out of context. A misinterpretation of the coded text, in general, and selected quotations, more specifically, could result in applying a theoretical framework to the overall findings that is inconsistent with lived experiences and social processes described by the participants (see Figure 4.2).

The 16 participants' responses to the brief survey describe a group of African American men, who were relatively marginalized and at high risk for HIV infection when compared to the general US population. Most notable are the participants' low educational attainment and the high proportion of men who have experienced homelessness, treatment for substance abuse, and incarceration. It was also ascertained during the analysis of the interviews that in addition to the ten participants who reported substance abuse treatment in the brief survey, the remaining six participants also reported substance use. It is important to note that substance use was not an inclusion criterion in the study. Ten participants reported having received substance abuse treatment. Very few of the participants reported ever being married. These particular characteristics are well established correlates of HIV risk behavior and infection (20, 66). The median number of male sexual partners was three and the number of female sexual partners was two in the past 30 days. One participant reported 40 male and 40 female sexual partners. If his case is removed, the mean and median are reduced considerably. In contrast, the majority of participants also reported characteristics that may be protective against HIV, including part- or full-time employment, a regular health care provider, religion, and having family in their geographic area (40, 66, 67, 173, 174). However, the quality and stability of employment, access to and availability of

health care and the supportive role of religion and family were not explored during the interview. The majority of participants reported having been tested for HIV, although the timing or frequency of testing was not queried. Eight participants reported an HIV negative status and seven had an unknown status or chose not to disclose (see Table 4.4).

Figure 4.2 Analytic process and products for Aim 1

Process	Product
Codebook Development - Step 1 Read interview guide: • Created 11 first generation structural codes based on the original 11 domains of inquiry • Created 68 first generation topical codes based on the questions under each domain of inquiry	• 1st generation structural codes (i.e., A.0 – K.0) • 1st generation topical codes (e.g., A.1 under A.0)
Categorization - Step 1 Read 16 interview transcripts in their entirety (1st time): • Applied the 1st generation structural and topical codes • Noted additional dimensions contained within the 11 1st generation structural codes • Noted additional topical codes that may capture responses to common probes not reflected by the questions contained in the interview guide	• Coded text from the 16 interview transcripts using 1st generation structural and topical codes • Notes to be used in the 2nd step of codebook development
Codebook Development - Step 2 Reviewed notes from 1st reading of 16 interview transcripts: • Created 2nd generation structural codes • Created 2nd generation topical codes • Added codes and rules of application for the 2nd generation codes to finalize the code book	• 2nd generation structural codes (e.g., Ca.0 - Cc.0 replaces C.0) • 2nd generation topical codes (e.g., A.5 under A.0)
Categorization - Step 2 Read 16 interview transcripts in their entirety (2nd time): • Applied 2nd generation structural and topical codes • Corrected any misapplication of codes using the finalized codebook	• Coded text from the 16 interview transcripts using 1st and 2nd generation structural and topical codes
Re-contextualization - Step 1 Attached memos to coded text: • Documented emergent themes within and among the 16 interview transcripts (connecting memo) • Reflected upon the researcher's contribution to the construction of meanings (connecting memo) • Noted text not represented by finalized codes (categorization memo)	
Re-contextualization - Step 2 Read 16 interview transcripts in their entirety (3rd time): • Documented emergent themes based on full interview transcripts • Ensured that words and meaning are not taken out of context and reduced to fit a theoretical framework	
Re-contextualization - Step 3 Returned to the three guiding research questions to organize and interpret the emergent themes	

Source: Adapted from Aujoulat et al. (175)

4.7.1.1 Descriptive Statistics for Aim 1 Respondents

Table 4.4 Demographic characteristics and sexual risk behavior of Aim 1 respondents (N=16*)

		(%)
Age		
Mean	40.44	
Median	40	
Range	23 - 52	
Number of male sexual partners in past 30 days		
Mean	6.6	
Median	3	
Range	1 - 40	
Not recorded	7	(43.75)
Number of female sexual partners in past 30 days		
Mean	8	
Median	2	
Range	0 – 40	
Not recorded	7	(43.75)
Total number of sexual partners in past 30 days		
Mean	14.6	
Median	5	
Range	1 – 80	
Not recorded	7	(43.75)
	n	**(%)**
Education		
Some high school	4	(25)
High school	4	(25)
Some college	6	(3.5)
Trade school	1	(6.25)
Grad school	1	(6.25)
Employment		
Employed (full & part-time)	11	(68.75)
Unemployed	5	(31.25)
History of incarceration		
Yes	12	(75)
No	4	(25)
Ever homeless		
Yes	14	(87.5)
No	2	(12.5)
History of substance abuse treatment		
Yes	10	(62.5)
No	6	(37.5)

Religion		
Christian	12	(75)
Non-religious	4	(25)
Family in area		
Yes	11	(68.75)
No	5	(31.25)
Health care provider		
Yes	10	(62.5)
No	6	(37.5)
Marital status		
Yes	1	(10)
Never	8	(80)
Divorced	1	(10)
Not recorded	6	(37.5)
City of residence		
Durham	1	(6.25)
Chapel Hill	1	(6.25)
Raleigh	14	(87.5)
Ever tested for HIV		
Yes	14	(87.5)
No	2	(12.5)
HIV serostatus		
Negative	8	(50)
Positive	1	(6.25)
Unknown	3	(18.75)
Undisclosed	4	(25)

*this dataset is a non-representative sample

4.7.2 Data Analysis for Aim 2

4.7.2.1 Missing Data for Aim 2

Missing data for the study Aim 2 egocentric dataset were examined for the assumption that it is missing at random. All observations for study Aim 2 were complete with regard to the selected explanatory variables and the outcome variable. Therefore, it was unnecessary to run logistic regressions to examine differences between observations with missing data and observations with complete data. The analyses used in this study utilized full information maximum likelihood estimation. These procedures allow every observation to contribute its data, preventing the loss of data that occurs with listwise or casewise deletion. Furthermore, a set of nine confounding variables were examined to assess if more than 10% of observations were missing for each of these

variables. With the exception of respondent history of incarceration, the remaining eight confounder variables were missing 0 to 3.48% of their observations (see list of variables in Table 4.6). The history of incarceration variable was missing 45.27% of its observations, and therefore, was not a good candidate for multiple imputation, which could otherwise reduce the impact of missing data. Therefore, respondent history of incarceration was dropped from the set of variables that were controlled for in the analysis and history of arrest was used as a proxy.

4.7.2.2 Control Variables for Aim 2

Respondent educational attainment, employment status, housing status, monthly income, number of sexual partners, history of arrest, injection drug use, and substance abuse treatment were treated as independent control variables in the analysis for study Aim 2, as there is strong empirical evidence that these variables are correlated with the selected explanatory variables as well as the outcome variable, sale of sex for drugs or money, in similar populations (see Table 4.6).

Table 4.6 Control variables for Aim 2 (N = 201)

		(%)
Number of sexual partners in past 6 months		
Mean (SE)	3.08	(0.228)
Median	2.00	
Variance	10.010	
Range	0 – 25	
Don't Know	3	(1.5)
Refuse to answer	5	(2.5)
Not applicable / Skipped	1	(0.5)
	n	**(%)**
Housing status		
Apartment, condo or you rent or own, or student dormitories	52	(25.9)
A family member's apartment or house	44	(21.9)
A lover's (boyfriend's, girlfriend's, or partner's) apartment or house	29	(14.4)
A friend's (not a lover's) apartment or house	16	(8)
A rented room in a hotel or rooming house	21	(10.4)
A shelter, boarding house, or halfway house	27	(13.4)
A squat, or an abandoned building, on the street (e.g. outside, vehicle, train station, etc.)	5	(2.5)
Other	7	(3.5)
Education		
No formal schooling	1	(0.5)
Elementary school but not finished high school	47	(23.4)
High school graduate (or GED)	133	(66.2)
Currently in college	7	(3.5)
Graduated from 4 year college or university	9	(4.5)
Pursuing or completing a graduate or professional degree	4	(2)
Employment		
Disabled, not able to work	32	(15.9)
Unemployed	92	(45.8)
Working full-time, 35 hours or more a week	38	(18.9)
Working part-time, less than 35 hours a week, could include labor pool or day work	23	(11.4)
A full time stay-at-home parent	3	(1.5)
Full time student	3	(1.5)
Retired	10	(5)

Income (past month)		
$0-500	117	(58.2)
$501-1000	49	(24.4)
$1001-1500	1	(0.5)
$1501 – 2000	3	(1.5)
10 = unknown	26	(12.9)
11 = unknown	1	(0.5)
Don't know	3	(1.5)
Refuse to answer	1	(0.5)
History of substance use treatment		
No	96	(47.8)
Yes	105	(52.2)
History of injection drug use		
No	150	(74.6)
Yes	51	(25.4)
History of arrest		
No	32	(15.9)
Yes	169	(84.1)

4.7.2.3 Analysis for Aim 2

Descriptive statistics were conducted for the demographic characteristics of the African American male respondents, the eight explanatory variables, and the outcome variable, sale of sex for drugs or money. Specifically, frequencies, percent distribution, mean, range, skewness, kurtosis and standard errors were performed (see Tables 4.7 - 4.10).

Univariate logistic regressions with generalized estimating equations (GEE) were conducted to model the unadjusted association between each of the eight continuous explanatory variables in relation to reported sale of sex for drugs or money. Then, each explanatory variable was tested for the assumption of linearity with respect to the logit. A threat of misspecification was addressed by adjusting for the curvilinear effect of two explanatory variables, dichotomizing one explanatory variable, and trichotomizing another explanatory variable to reflect the effect of distinct conditions on the outcome variable, reported sale of sex for drugs or money.

GEE multivariate analyses were conducted in full and best models after adjusting for potential confounders. Explanatory variables significant at $p \leq 0.10$ in the unadjusted univariate

analyses were selected for entry in the adjusted best model to assess the contribution of each covariate. In order to limit the number of parameters during modeling, continuous variables were retained in their original form.

In this sample, observations are non-independent due to snowball sampling and personal network inventories completed by each respondent. Clustered data violate the assumption of independence between observations, which affect standard errors in a statistical model and may increase the potential for a Type 1 error. Therefore, logistic regression models with GEE were used to control for this source of correlation for the egocentric network and dyadic datasets. An exchangeable matrix was employed where correlations between all observations were assumed equal (176). This analytic approach is intended to produce robust standard errors. Network study seed chains were used as the cluster factor to study the influence of seeds on subsequent responses to the explanatory and outcome variables among the first and second wave respondents. There were 17 African American male network seeds who recruited African American men into the study. There were also first and second wave respondents who were recruited by 11 other network seeds who were not African American males. Therefore, 28 seed chains were accounted for using GEE and estimates were obtained using a link function (177) and the Huber-White correction (178, 179) since this approach provides valid parameter estimates for data that is non-independent (124, 180). All p values were two-tailed tests. For the full and best model, significance was set at $p \leq 0.05$. All analyses were conducted using SAS v.9.3 (SAS, Cary, NC, USA).

4.7.2.4 Power Analysis for Aims 2 and 3

The study was designed to ensure enough power for the Aim 2 and Aim 3 analyses to be performed. Using estimates of sexual exchange among networks with high and low drug use, I surmised that there is enough power to detect significant relationships in my hypotheses for Aim 2 and Aim 3 using the SATH-CAP dataset. The chance of a committing a Type II error is minimal. I have

enough power to detect the design effect that I desire (see Appendix F: Sample Size and Power Calculation, Table 4.20).

4.7.2.5 Descriptive Statistics for Aim 2

Table 4.7 Demographic characteristics of Aim 2 respondents (N = 201)

		(%)
Age		
Mean (SE)	42.23	(0.70)
Median	42.28	
Range	18.62 –	67.11
Total number of sexual partners in past 6 months		
Mean (SE)	3.08	(0.228)
Median	2.0	
Variance	10.010	
Range	0 – 25	
Skewness (SE)	3.5	(0.175)
Kurtosis (SE)	17.439	(0.349)
Don't know	3	(1.5)
Refuse to answer	5	(2.5)
Not applicable / Skipped erroneously	1	(0.5)
	n	**(%)**
Biological sex		
Male	201	(100)
Race/Ethnicity		
African American non-Hispanic	199	(99.0)
Mixed (African American & Latino)	2	(0.01)
Participated in main study		
No	188	(94.5)
Yes	13	(6.5)
Seed respondent for network study		
No	184	(91.5)
Yes	17	(8.5)
Ever injected drugs		
No	150	(74.6)
Yes	51	(25.4)
History of substance use treatment		
No	96	(47.8)
Yes	105	(52.2)
Ever arrested		
No	32	(15.9)
Yes	169	(84.1)

History of incarceration		
None, never been to prison or jail	17	(18.5)
Less than 1 month	22	(10.9)
1 month to 1 year	32	(15.9)
More than 1 year	36	(17.9)
Don't know	3	(1.5)
Not applicable or not recorded	91	(45.3)
Sexual behavior		
I have sex only with men	8	(4.0)
I have sex mostly with men, but occasionally with women	6	(3.0)
I have sex with about equal numbers of men and women	5	(2.5)
I have sex mostly with women, but occasionally with men	20	(10)
I have sex only with women	160	(79.6)
Refuse to answer	2	(1.0)
1 year ago, any sexual partners not named in the personal network inventory		
No	75	(49.7)
Yes	72	(47.7)
Not recorded	4	(2.6)
Respondent did not nominate any sexual partners	50	n/a
HIV serostatus		
Negative	172	(85.6)
Positive	17	(8.5)
Refuse to answer	12	(6)

Table 4.8 Outcome variable for Aim 2 (N = 201)

	n	**(%)**
Have you ever received money or drugs as payment for sex?		
No	145	(72.1)
Yes	56	(27.9)

Table 4.9 Personal network composition explanatory variables for Aim 2 (N = 201)

	Proportion	
History of incarceration		
Mean (SE)	0.208	(0.021)
Median	0	
Variance	0.088	
Range	0-1	
Skewness (SE)	1.4	(0.172)
Kurtosis (SE)	0.955	(0.341)
Employment		
Mean (SE)	0.366	(0.026)
Median	0.286	
Variance	0.133	
Range	0-1	
Skewness (SE)	0.528	(0.172)
Kurtosis (SE)	-1.071	(0.341)
Drug partners		
Mean (SE)	0.594	(0.029)
Median	0.6667	
Variance	0.1630	
Range	0-1	
Skewness (SE)	-0.399	(0.172)
Kurtosis (SE)	-1.425	(0.341)
Sexual partners		
Mean (SE)	0.424	
Median	0.025	
Variance	0.4	(0.121)
Range	0-1	
Skewness (SE)	0.352	(0.172)
Kurtosis (SE)	-1.071	(0.341)

Table 4.10 Social support function explanatory variables for Aim 2 (N = 201)

	Proportion	
Emotional support		
Mean (SE)	6.105	(0.163)
Median	6.333	
Variance	5.306	
Range	0-10	
Skewness (SE)	-0.648	(0.172)
Kurtosis (SE)	0.355	(0.341)
Instrumental support		
Mean (SE)	0.281	(0.022)
Median	.2	
Variance	0.098	
Range	0-1	
Skewness (SE)	1.127	(0.172)
Kurtosis (SE)	0.337	(0.341)
Informational support		
Mean (SE)	0.251	(0.021)
Median (SE)	0.2	
Variance	0.089	
Range	0-1	
Skewness (SE)	1.281	(0.172)
Kurtosis (SE)	9.809	(0.341)
Appraisal support		
Mean (SE)	0.052	(0.009)
Median	0	
Variance	0.018	
Range	0-.75	
Skewness (SE)	3.008	(0.172)
Kurtosis (SE)	9.557	(0.341)

4.7.3 Data Analysis for Aim 3

4.7.3.1 Missing Data for Aim 3

There were several missing sexual partner dyad observations. One of the African American male respondents answered “refuse to answer” when reporting unprotected sex for each of his three nominated sexual partners. Another African American male respondent answered “don’t know” when asked if his four alters were sexual partners. Therefore, the seven potential dyad pairs for these two respondents were dropped from the analysis. More importantly, erroneous skip patterns (ESP) were programmed into the survey and it is not clear why certain African American

male respondents were skipped out of answering the selected Aim 3 outcome variable as well as several other items that were asked for each nominated sexual partner. A thorough analysis of respondents who were impacted by the ESP demonstrated no meaningful pattern by data collection site, seed status, seed chain, or date of data collection (see Table 14.11). Therefore, 85 dyadic pairs were dropped from the analysis because the outcome variable was not answered for each of the nominated sexual partners, and instead contained a "not applicable" response. Some of the more robust seed chains were more impacted by these dyad deletions, though no complete seed chain was impacted by the ESP. Therefore, 229 nominated sexual partners were included in the dyadic dataset for Aim 3. Missing data for the Aim 3 explanatory variables were examined for the assumption that data are missing at random.

Table 4.11 Missing data for the Aim 3 Dataset

Data Collection Site (county)	**Durham**	**Wake**	**Johnston**	**Chatham**	**TOTAL**
All network study respondents	223	180	50	31	484
African American respondents	87	87	12	15	201
African American respondents impacted by ESP	18	19	2	1	40
African American respondent sexual partner dyads	166	139	5	11	321
African American respondent sexual partner dyads due to ESP	43	39	2	1	85
Proportion of dataset deleted due to ESP	.26	.28	.40	.09	.26

4.7.3.2 Control Variables for Aim 3

A subset of five variables that were treated as independent control variables in the Aim 2 multivariate analyses were used in the Aim 3 analysis due to their correlation with the selected explanatory variables and the outcome variable, unprotected sex, in similar populations. The control variables were respondent-level variables and included: educational attainment, employment

status, housing status, monthly income, and number of sexual partners in the past six months (see Table 4.6).

4.7.3.3 Analysis for Aim 3

For study Aim 3, the original subset of 201 responses from the African American male respondents was converted to a dyadic dataset to study the relationship between three dyad characteristics and four social support functions variables and unprotected sex for each of the 229 dyadic pairs consisting of an African American male respondent and each of his nominated sexual partners.

Descriptive statistics were conducted for the demographic characteristics of the African American male respondents' nominated sexual partners, the seven explanatory variables, and the outcome variable, unprotected sex. Specifically, frequencies, percent distribution, mean, range, skewness, kurtosis and standard errors were performed (see Tables 4.12 - 4.14).

Similar statistical analyses were conducted for the third study aim. Univariate and multivariate logistic regression models with GEE were used with the same cluster factor, seed chain. There will be non-independent observations in this sample because African American male respondents nominated each sexual partner into the study as part of their personal network inventories. Specifically, clustered data violate the assumption of independence between observations, which affects both the coefficient estimates and standard errors of a statistical model. Therefore, the 28 seed chains described in the Aim 2 analyses were accounted for using GEE Lastly, six of the seven explanatory variables were dichotomous and referent groups were informed by relevant literature and empirical evidence.

4.7.3.5 Descriptive Statistics for Aim 3

Table 4.12 Demographic characteristics of respondents' nominated sexual partners for Aim 3 (N=229)

		(%)
Age		
Mean (SE)	35.34	(0.569)
Median	35	
Range	17- 60	
Variance	74.173	
Skewness (SE)	0.112	(0.161)
Kurtosis (SE)	-0.222	(0.320)
	n	**(%)**
Biological sex		
Female	205	(89.5)
Male	24	(10.5)
Race/Ethnicity		
African American	182	(79.5)
White	35	(15.3)
Other	8	(3.5)
Not Applicable / Skipped	4	(1.7)
Type of relationship (later transformed to type of sexual partnership)		
Main sex partner	26	(11.4)
Boyfriend/girlfriend	33	(14.4)
Spouse	12	(5.2)
Sex partner	108	(47.2)
Friend	35	(15.3)
Acquaintance	12	(5.2)
Neighbor	1	(0.4)
Roommate	1	(0.4)
Other	1	(0.4)
HIV status		
Negative	22	(9.6)
Positive	6	(2.6)
Don’t Know	54	(23.6)
Refuse to Answer	4	(1.7)
Not Applicable / Skipped / Not recorded	143	(62.4)

Table 4.13 Outcome variable for Aim 3 (N = 229)

	n	**(%)**
Have you had unprotected sex, (i.e., sex without a condom) with any of these people?		
No	79	(34.5)
Yes	150	(65.5)

Table 4.14 Dyad characteristics and social support function variables used to model unprotected sex within sexual partner dyads (N=229)

	n	(%)
Dyad Characteristic		
Partnership		
Not Primary	158	(69.0)
Primary	71	(31.0)
Drug partner		
No	90	(39.3)
Yes	139	(60.7)
Biological sex concordance		
Male sexual partner / concordance	24	(10.5)
Female sexual partner / discordant	205	(89.3)
Social Support Function		
Instrumental support		
No	132	(57.6)
Yes	97	(42.4)
Informational support		
No	142	(62.0)
Yes	87	(38.0)
Appraisal support		
No	206	(90.0)
Yes	23	(10.0)
Emotional support		
Mean (SE)	6.89	(0.154)
Median	7	
Range	1 - 10	

4.8 Diagnostics for AIM 2 and Aim 3

In addition to assessing missing data for the Aim 2 and Aim 3 datasets, two other diagnostics were conducted to assess the fit of the logistic models. Specifically, there was concern that the explanatory variables for Aim 2 are not linear with respect to the logit (e.g., moving from 90% to 100% of a respondent's alters with a personal network composition attribute may be different than moving from 50% to 60%). Without testing the assumption of linearity, "the inferences drawn from the model may be misleading or even totally incorrect (181)." As evidenced in Table 4.15, a violation of linearity with respect to the logit exists for all eight explanatory variables. These violations may affect the parameter estimates and standard errors (181) (See Appendix G: Testing the assumption

of linearity with respect to the logit, Tables 4.19a and 4.19b). It can be assumed that a similar violation of the assumption of linearity with respect to the logit is present with the Aim 3 explanatory variables. Adjustments for the non-linear nature of the variables in described in a later section.

The explanatory variables for Aim 2 and Aim 3 were assessed for collinearity. An explanatory variable with a variance inflation factor (VIF) value greater than 10 may merit further investigation to assess if the variable could be considered as a linear combination of other explanatory variables. Tolerance, defined as 1/VIF, is a common means of assessing the degree of collinearity. A tolerance value that is lower than 0.1 is comparable to a variance inflation factor value of 10 (176). However, as evidenced in Tables 4.22 and 4.23, the explanatory variables for the second and third study aims do not appear to be multi-collinear in nature (see Appendix H: Assessment of Collinearity, Tables 4.21 and 4.22).

4.9 Integration Of Quantitative And Qualitative Analysis And Findings

Mixed method studies can be described by their different degrees of mixing at the four stages of the research process, including (1) research question formulation, (2) data collection, (3) data analysis, and (4) data interpretation (182). As previously mentioned, the SAMS qualitative study used for Aim 1, was conceptualized as a result of the preliminary findings from the SATH-CAP main study which was designed in tandem with the SATH-CAP network study. The present mixed-methods study is a secondary analysis; therefore the third and fourth stages of research are considered mixed. Arguably, the first stage of research question formulation is also at play because the guiding questions for Aim 1 and the research questions and hypotheses for Aim 2and Aim 3 are my own and were not explicitly articulated at the time of the parent study's design and implementation. Furthermore, the study can be categorized as a sequential mixed methods design because the SAMS data were collected after both SATH-CAP studies' data collection were completed

(183, 184). However, the study can also be considered a concurrent mixed methods design because the data were analyzed simultaneously and interpreted in an integrated manner in the conclusion chapter (183, 184).

As shown in the conceptual model, Aim 1 was answered using the SAMS qualitative data. The three guiding questions for this qualitative study aim were intended to provide insight into the broader landscape believed to inform the social network composition and social support function that was hypothesized to influence the sale of sex for drugs or money among African American male substance-users and unprotected sex among the same men's sexual partner dyads (see Figure 3.1). I simultaneously completed the analyses for study Aims 1, 2 and 3. As described earlier in this chapter, a rigorous memo writing regimen was employed during the analyses of the in-depth interview transcripts for Aim 1 (see Figure 4.2). The statistical analyses for Aim 2 and Aim 3 were considered during memo writing and the development of topical codes that were then applied to the in-depth interview transcript data.

Lastly, my use of mixed methods is motivated by my desire to answer a more complex set of research questions and to arrive to a more nuanced set of implications for next steps in research and practice. Ultimately, my intention is to capitalize on the depth of qualitative inquiry and breadth of quantitative inquiry to produce a comprehensive "end product that is more than the sum of the individual quantitative and qualitative parts" (148). In this chapter, a comparison of the demographic characteristics, sexual risk behaviors, and sexual identities of the respondents from the qualitative and quantitative datasets are presented in order to demonstrate the great similarities and slight differences between the two study populations despite their distinct recruitment into their respective studies (see Appendix I: Comparison of the Two Parent Study Populations)

In the conclusion chapter, I used illustrative quotes from the qualitative findings when describing the quantitative findings. Additionally, when describing emergent themes and illustrative quotes from the qualitative analysis, I provided quantitative evidence to bolster these findings (184). One of the challenges to conducting mixed methods research is delineating complementary qualitative and quantitative research questions; however, much thought has been invested in the conceptual model.

CHAPTER 5: MANUSCRIPT 1

Sexual risk behavior as a continuum of violence among structurally vulnerable, African American, substance-using men who have sex with men in North Carolina

5.1 INTRODUCTION

Despite an overall decline in HIV infection rate in the US, HIV incidence among African American men has continued to increase over the last decade (4). In 2006, the HIV incidence for African American men was two times as high as that of African American women, and six times as high as that of white men (5). Using surveillance data from 33 states in 2005, the Centers for Disease Control and Prevention (CDC) reported that, among African American men, same sex activity was the most likely risk behavior associated with HIV infection, followed by injection drug use (IDU) and high-risk heterosexual activity (185, 186). In 2006, African American men who had sex with men (MSM) represented over one-third of new HIV infections among MSM of all racial/ethnic groups and nearly two-thirds of new HV infections among all African American men (5). In a CDC surveillance study of MSM conducted from 2004 to 2005 in five US cities, it was estimated that nearly half of African American MSM tested positive for HIV, compared to 21% of white male respondents and 17% of Latino male respondents (39). Other studies have shown that African American, non-gay identified MSM reported lower HIV screening rates (41, 42) and less consistent condom use (24, 27) than African American MSM who identify as gay. Furthermore, African American men who have sex with men and women (MSMW) are less likely to disclose their same-sex behavior to at least one sexual partner when compared to African American MSM (19).

African American MSM and men who have sex with men and women (MSMW) bear a disproportionate HIV burden despite strong evidence suggesting that their engagement in sexual and substance-related risk behaviors is comparable to their counterparts from other racial/ethnic groups in the US (7, 26, 56-58). However, among African American MSM/MSMW who confront material, social and psychological needs, their HIV-related risk behaviors, such as having high-risk sexual partners or engaging in sexual exchange for drugs or money, are not experienced by more socially advantaged members of their communities (24, 63, 66, 103). This is particularly true among men who have been involved in the criminal justice system (10, 20). Moreover, among the more disadvantaged, the consequences from these behaviors are amplified due to greater HIV and STI prevalence within their sexual and substance-using networks (37, 64, 65), as well as barriers to accessing timely testing, diagnosis and treatment (37, 65, 67-70).

In addition, studies have found that African American MSM/MSMW are using more substances than those who do not identify as gay, bisexual, or same gender loving, which may exacerbate their HIV risk (22, 131). Harawa and colleagues qualitatively explored the role of substance use among low-income African American MSM/MSMW and found that substance use motivated their sexual behavior with other men, which served as a justification for unprotected sex with men and, overall, enabled access to male sexual partners (63). Their focus on structurally vulnerable African American men underscored the need to further explore the influence of social conditions on sexual risk behaviors of similar men.

Whitehead described how men are socialized to construct their ideal masculinity and sense of self by cultivating respect and reputation though economic capacity, sociopolitical power and sexual prowess (152). In his work with African American men, Whitehead argued that too often the only avenue for structurally vulnerable men is to affirm their masculine identity by cultivating their reputation and exercising their sexual prowess (152). This is consistent with Courtenay's assertions

"that health behaviors are used in daily interactions in the social structuring of gender and power" and that the "behaviors that undermine men's health are often signifiers of masculinity and instruments that men use in the negotiation of social power and status" (153). The majority of existing HIV prevention interventions have rarely reconciled the inherent tension between constructions of masculine identity and safer sex practices, especially among structurally vulnerable men. Moreover, the majority of such interventions have not been designed for African American MSM and MSMW who do not identify as gay, bisexual, or same gender loving. These same men often face multiple forms of discrimination and, thus, present their sexual identity differently depending on the setting and recipient of this information (27, 187, 188). These men have often been cited as the main drivers of the disproportionate HIV burden in African American communities and, as such, blame has diverted attention away from the social conditions that are shaping the HIV epidemic (27, 188, 189).

Important gaps exist in understanding how social conditions shape the HIV risk behaviors of African American, substance-using MSM and MSMW, despite a call for action among scholars and activists since the advent of HIV/AIDS (60). The urgency of this call has been further underscored by the shift in the HIV disease burden over the last three decades from IDU and white middle class, gay-identified MSM to structurally vulnerable populations of color (51, 61, 62). Using verbatim transcripts from semi-structured interviews completed with a population of African American substance-using MSMW in North Carolina, the present study comprised a secondary data analysis to explore how social conditions shape African American MSMW's sexual norms, substance-using norms and HIV risk behaviors.

Link and Phelan's theory of social conditions as fundamental sources of health inequities informed the exploration of social conditions that shape study participants' intersecting sexual and substance-using norms and behaviors (149, 150). They argued that health disparities persist in spite

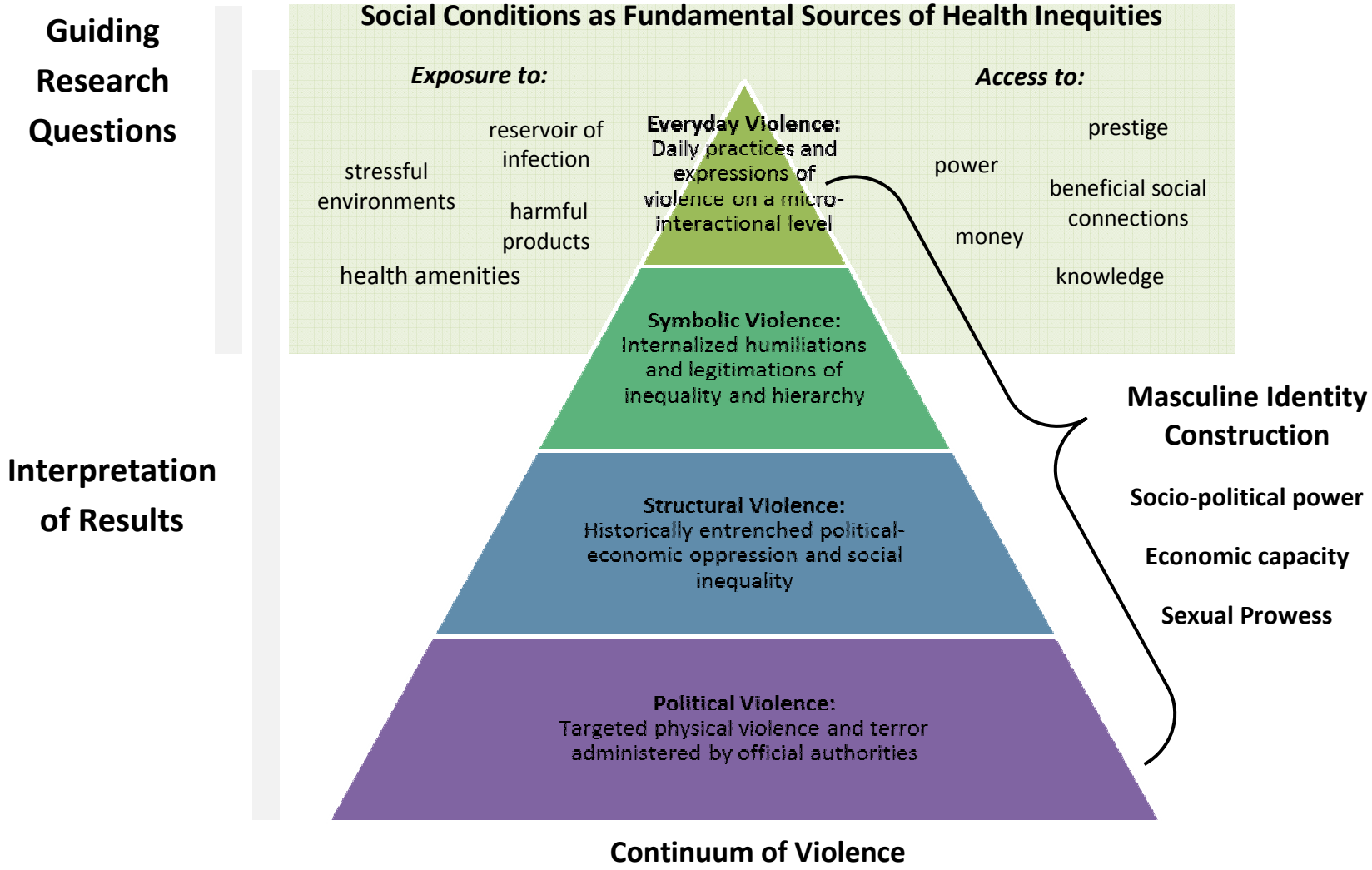
of changing proximal risk factors because socioeconomic status is associated with differential access to "money, knowledge, prestige, power, and beneficial social connections" as well as exposure to stressful environments, harmful products, and reservoirs of infection (150). Furthermore, Link and Phelan contended that attempts at reducing *risk behavior* may be unsuccessful if the pathways to *risk exposure* are not understood. That is, efforts to reduce risk behaviors among African American MSMW may be unsuccessful if the pathways to sexual and substance-use risk exposures are not understood (150).

A second theoretical foundation that informed the present study comes from the work of Scheper-Hughes and Bourgois. Their *Continuum of Violence* framework includes theoretical constructs that align with the study's orientation toward social conditions as fundamental sources of health inequities. Specifically, Scheper-Hughes and Bourgois posited that political, structural and symbolic experiences of violence manifest in everyday "practices and expressions of violence on a micro-interactional level" (151)(p. 7). These expressions can be understood as assaults to one's personhood and dignity through various forms of interpersonal and intrapersonal violence that are associated with of self-devaluation, resignation, helplessness, hopelessness, accepting of one's limitations (190). The application of this framework to the present study could help expose the historical context and modern-day social conditions, such as persistent poverty, paralyzing incarceration, and chronic unemployment that shape African American, substance-using MSMW's sexual risk behaviors and daily health challenges.

The current study was, therefore, guided by the following analytical questions: (a) What macro-level determinants form and maintain the sexual risk normative behaviors described by the men? (b) What sexual and substance-using subjective norms shape the HIV risk behaviors, including

sexual exchange, described by the men? And (c) What patterned social arrangements shape the knowledge, attitudes, beliefs and HIV risk behaviors of the men?

Figure 5.1 Theoretical frameworks guiding the initial analysis and interpretation of results



5.2 METHODS

The present study comprised a secondary data analysis of verbatim transcripts from in-depth interviews completed with 16 African American MSMW for the Sexually Active Men's Study. The parent study was funded by the Center for AIDS Research (an NIH-funded program) at the University of North Carolina at Chapel Hill to elucidate factors associated with the initiation and continuation of sexual behavior among sexually-active men that placed them at high risk for HIV acquisition and transmission. In-depth interviews were completed from 2007 to 2008 in Raleigh and Durham, North Carolina.

5.2.1 Sampling & Recruitment

The parent study employed a non-probability sampling approach, or purposive sampling, to select men who met the following eligibility criteria: (a) were of 18 to 55 years of age; (b) ability and willingness to provide written informed consent to participate in the study; (c) reported having sex with a man and a woman in the past six months; and (d) reported high-risk sexual activity. This final criterion was defined as meeting one or more of the following: (a) on average, having three heterosexual sex acts per week over the past month; (b) having three or more different sexual partners in the previous month; or (c) having sex with an injection drug user or sex worker in the past six months (163). Recruitment materials were posted at two public libraries and distributed at two study sites, a criminal justice resource center and a county-sponsored emergency and transitional shelter for homeless men. These materials encouraged men to call a study telephone line if they were able to respond in the affirmative to the following intentionally vague questions: (a) Are you a sexually-active man between the ages of 18 and 55? (b) Have you had more than one sexual partner in the past six months? (c) Do you know men who have sex with men and women? and (d) Are you willing to share your experiences in a confidential interview? As a result of recruitment and screening efforts, 20 men participated in the study. Two interviews were not

transcribed due to poor audio recordings. Additionally, two interviews were dropped from the analysis due to distinct social experiences from the 16 African American men who participated in the study. One interview was completed with a Puerto Rican man who identified himself as a professional sex worker and another interview was completed with a white man. Written informed consent was obtained from each participant prior to study enrollment. Participants were compensated for participating in the study and the reimbursement amount was specified in the informed consent form. The internal review board (IRB) from RTI, International and FHI (now FHI 360) approved the parent study and the IRB at the University of North Carolina at Chapel Hill approved the secondary data analysis for this study.

5.2.2 Data Collection

For the parent study, three female interviewers were trained to administer a brief quantitative survey containing demographic and HIV risk factor items, and a semi-structured interview guide. Questions from the interview guide explored the following topics with each participant: (1) dynamics and characteristics of current main sexual partner(s); (2) dynamics and characteristics of current non-main sexual partner(s); (3) sexual identity; (4) first sexual experience with a woman; (5) first sexual experience with a man; (6) differences in sexual experiences and relationships with men and women; (7) current drug use and risk behaviors; (8) sexual exchange for drugs or money; (9) history of coercive sex; (10) history of incarceration; and (11) recruitment of other men who have sex with men and women. The interviews lasted approximately 60 minutes, were audio-recorded, and transcribed verbatim. The present study comprised an analysis of de-identified transcripts and brief surveys completed with 16 African American participants.

5.2.3 Data Analysis

An inductive thematic analysis of the secondary data began with reading the 16 interview transcripts and a careful mapping of the interview guide, which resulted in a codebook containing detailed descriptions and rules of assignment for each code. Structural codes were first developed to broadly index the text representing the domains of inquiry contained in the interview guide as well as demographic and participant characteristics (167, 168). Topical codes were developed to map the specific questions and probes articulated within each domain (167, 168). After an initial reading and coding of the 16 interviews transcripts, new structural codes were created to represent additional dimensions contained within the original domains. In particular, the domains of (3) sexual identity, (7) current drug use and risk behaviors, (8) sexual exchange for drugs or money, and (10) history of incarceration were expanded. Additional topical codes were developed to capture common probes not contained in the interview guide as well as common participant responses. As part of the second reading of the interview transcripts, the finalized structural and topical codes were assigned to the text. ATLAS.ti (v.6.2) was used to code the interview transcripts (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany).

Throughout the reading and coding process, memos were written to assess code suitability, examine the influence of interviewer-participant interaction, and reflexively examine the influence of researcher subjectivity on the construction of meanings (169). Additionally, memos documenting overarching emergent themes were written throughout this process and assisted in moving the results beyond a descriptive summary of the interviews. To further explore and substantiate emergent themes, code reports were generated for each code and, for various intersections of codes, within and across the coded interview transcripts using ATLAS.ti. Quotations within these code reports were noted for differences among participants (170). Quotations were then selected that most clearly illustrated the emergent themes and represented a majority of the participants'

voices (171, 172). Lastly, all selected quotations were highlighted in the original interview transcripts and reread in their entirety. These measures were taken to ensure that the quotations were not interpreted out of context. A misinterpretation of the coded text, in general, and selected quotations, more specifically, could result in applying a theoretical framework to the overall findings that is inconsistent with lived experiences and social processes described by the participants.

5.3 RESULTS

The results section begins with a description of study participants based on the brief survey and continues with a description of their responses to the sexual identity question from the interview. The emergent themes are then explained and supported by illustrative quotations from study participants. Alphabetically-ordered pseudonyms were substituted for the participants' real names when presenting these quotations. The themes are organized using the Continuum of Violence framework. Specifically, an explanation of the emergent themes starts by describing a theme that spanned political and structural violence, which is followed by a theme that spanned structural and symbolic violence. Several examples of symbolic violence are then highlighted. Finally, the last set of themes encompasses everyday violence and includes explanations of unmet needs, normalization of risk behaviors and contexts, sexual silence, and rigidity and constraint described by the men.

5.3.1 Description of Participants

The 16 participants' responses to the brief survey describe a group of African American men, who were relatively marginalized and at high risk for HIV infection when compared to the general US population. Ten participants reported having received substance abuse treatment. Very few of the participants reported ever being married. These particular characteristics are well established correlates of HIV risk behavior and infection (20, 66). The median number of male sexual partners was three and the median number of female sexual partners was two in the past 30 days.

One participant reported 40 male and 40 female sexual partners. If his case is removed, the mean and median are reduced considerably. In contrast, the majority of participants also reported characteristics that may be protective against HIV, including part- or full-time employment, a regular health care provider, religion, and having family in their geographic area (40, 66, 67, 173, 174). The majority of participants reported having been tested for HIV, although the timing or frequency of testing was not queried. Eight participants reported an HIV negative status and seven had an unknown status or chose not to disclose (see Table 5.1).

Table 5.1 Participant demographic characteristics and HIV risk behavior (N=16)

Age		
Mean	40.44	
Median	40	
Range	23 to 52	
Number of Male Sexual Partners in Past 30 days^		
Mean	6.6	
Median	3	
Range	1 to 40	
Number of Female Sexual Partners in Past 30 days^		
Mean	8	
Median	2	
Range	0 to 40	
Total Number of Sex Partners in Past 30 days^		
Mean	14.6	
Median	5	
Range	1 to 80	
	n	**(%)**
Educational Attainment		
Some high school	4	(25)
High school	4	(25)
Some college	6	(37.5)
Trade school	1	(6.25)
Grad school	1	(6.25)
Employment Status		
Employed (part- or full-time)	11	(68.75)
Unemployed	5	(31.25)
History of Incarceration		
Yes	12	(75)
No	4	(25)
Ever Homeless		
Yes	14	(87.5)
No	2	(12.5)

History of Substance Abuse Treatment		
Yes	10	(62.5)
No	6	(37.5)
Religion		
Christian	12	(75)
Non-religious	4	(25)
Family in Area		
Yes	11	(68.75)
No	5	(31.25)
Health Care Provider		
Yes	10	(62.5)
No	6	(37.5)
Marital Status		
Currently married	1	(10)
Never married	8	(80)
Divorced	1	(10)
Not recorded	6	(37.5)
Ever Tested For HIV		
Yes	14	(87.5)
No	2	(12.5)
HIV Serostatus		
Negative	8	(50)
Positive	1	(6.25)
Unknown	3	(18.75)
Undisclosed	4	(25)
Sexual Exchange		
Yes	16	(100)
No	0	(0)
Substance Use		
Yes	16	(100)
No	0	(0)

Political and Structural Violence

In the Continuum of Violence framework (Figure 1), political violence is characterized as "targeted violence and terror administered by official authorities", and structural violence is characterized as "historically entrenched political-economic oppression and social inequality" (191). While there was no explicit discussion of targeted physical violence or the legacy of enslavement among this sample of men, a majority of the men remarked on the broader implications of incarceration. Anthony, a 52-year- old, bisexual-identified, HIV-negative man with some college

education who works part-time as a clerical worker, described his experiences in prison and the impact of the prison industrial complex on the lived experiences of African American men.

> *It is really a tool that society uses to castrate black men, to control black men. Keep 'em where they are, because they are feared, feared where they want to be. They say they are feared because they are angry and whatnot, but they're not. They are just made out to, made out to be angry, to be harmful… [In prison] I met some of the best people in my life, know what I'm saying? Some of the best people, and we both saw the best in each other.*

The prison-industrial complex in the US is an example of how political and structural violence are bridged. It has been argued that the contemporary prison-industrial complex is functionally equivalent to the original institution of slavery in the US, Jim Crow laws, and the post-industrial ghetto by carrying out the same roles and tasks of housing the dishonored, disreputable and 'dangerous' sectors of society (52, 192). Anthony's remarks demonstrate his understanding of how the government-sanctioned prison industrial complex disproportionately impacts African American men. Moreover, his description of incarceration as a tool to control African American men is an example of his understanding of a historically-entrenched form of oppression. His insights can be categorized as both political and structural violence.

Structural and Symbolic Violence

Participant interviews resulted in overwhelming narrative about poverty, perceived and experienced institutional racism, and community-level homophobia, which resulted in reflections on and expressions of inferiority. In one example, Bernard, a 47-year-old, gay-identified, HIV-positive man with a history of homelessness, substance abuse treatment, and incarceration, described his perceptions of incarceration, inadequate legal representation, and the shame of poverty.

> *Then you put these people who have no means of protecting or fighting for their rights in there [prison]. And then you say, "Well, why are they so corrupt and destructive?" Because they lose hope, they become delusional. That's my belief. I don't think that you have to go there [jail or prison], but I think where we are now, money counts... we look down on somebody who doesn't have money as being lazy.*

Bernard's observation exemplifies a key perception among participants that structurally vulnerable individuals and communities are disproportionately impacted by incarceration. It is notable that Bernard has a graduate degree and is a retired banker, yet he shares indicators of marginalization with his fellow study participants that have less formal education or established careers. His comments speak to the symbolic violence of blaming structurally vulnerable individuals when they are actually disproportionately impacted by inadequate legal representation and correctional institutions.

On the continuum, I have characterized these narratives as bridging structural and symbolic violence. As part of a social world, individuals and communities accept a range of beliefs and behaviors that help to maintain the existing social order. Symbolic violence is not often recognized as violence because it manifests in unspoken and unexamined forms of social domination. These processes can result in "internalized humiliations," a devaluation of who individuals think they are and how they situate themselves in the world, which may "legitimize social inequality and hierarchies" (191).

Symbolic Violence

Several other forms of symbolic violence surfaced from the participant narratives. The men spoke about how their communities engaged in social practices and power relationships that may disguise inequality and legitimatize oppressive social conditions as natural (193). This was evident when the men reflected on the lack of social integration after prison release. Calvin is a 45- year-old, straight-identified, HIV-negative man with some college education who works as a brick mason and has a history of homelessness, substance abuse treatment, and incarceration. He spoke of how the lack of social integration leads many men to return to substance use, sexual risk behavior with men, and criminal behavior.

> *I'm from the South, it's [the culture] hush-hush, take to the grave with it. And thus, you continue to use [substances], continue to do this [same-sex sexual risk] behavior. Continue*

to rob banks 'cause they ain't had nobody to talk to. It's crazy. There are people that rob and kill because won't nobody sit there and talk to them. And I've been in the penitentiary and talked to people, and when they in the penitentiary, they so educational. They sit down and talk to you. You would never think that he was a murderer. But when they get out, the world shuns them so bad. It pushes them in a corner, don't talk to 'em, don't communicate with 'em, don't give 'em no opportunities. So they say "Let me go back right to what I know."

Calvin's remarks encapsulate the shared perception among the men that individuals with a history of incarceration occupy a lower social status. In addition, his words reflected his observations on intersecting stigma associated with race/ethnicity, sexual behavior, and substance use. Social class and race/ethnicity also factored into many of the men's descriptions of community-level homophobia, which may also be understood as symbolic violence. Douglas is a 43-year-old, gay-identified man who is unemployed, has an undisclosed HIV status, a high school education, and a history of homelessness, substance abuse treatment, and incarceration. He described his perceptions of how communities inadvertently conceal larger mechanisms of power that may contribute to fear and non-acceptance of same-sex sexual behavior.

The poorer and the darker the skin, the more homophobic. The lighter and the more affluent the less so. They just want, you know, to just pay your bills, keep your house clean, your yard clean and they don't care. Just be a good neighbor. They could care less who you sleep with. But I think the poorer and darker, the more the homophobe. That is my life experience. And I hate to say it, but it's true.

The men were keenly aware of how social status and the power of blame contribute to community-level forms of homophobia. In particular, Calvin described how African American MSMW are blamed for transmitting HIV to women and the influence this has on disclosure of his sexual behavior.

You see it in the news, if someone comes out and they say "Ok, I've had a homosexual relationship," then it's like they're banished. But then you can see some, some gay people, senators, ministers, and everybody sees that they're gay and it's like "Ok." But if you say you've had a gay relationship to a woman, then it's like, "You're passing their stuff to us." And to protect you, you keep from showing it, and keep it, keep it to who you need to talk to about it, and you don't go through that. Yeah, because they figure like you're giving it over to the female population, the AIDS, that you're giving it to the female population. So it's like, you know, most homosexuals they won't even touch a man, I mean a female. So, if you bisexual, that's what's bringing it. They figure like, it's fine if the homosexuals keep it, but

> *then if you're bisexual, they feel like you're transferring it over to them. Like if I sleep with a woman, she'd get AIDS.*

The men presented vivid examples of the interplay surrounding community-level and internalized homophobia, and spoke of its pervasive nature. Anthony's words particularly exemplify this perception.

> *In my experience, no one is [accepting of same-sex sexual behavior]. Not even, uh, not even um, what you might say, staunch, top notch homosexuals or whatever. They are not really accepting of themselves.*

The consequence of the men's shared perceptions about inescapable homophobia appeared to prevent open dialogue about sexual behavior, which otherwise may have led to discussions about sexual risk reduction strategies among MSM and MSMW. Furthermore, many of the men described the ramifications of disclosing their same-sex sexual behavior as well as their own struggles with internalized homophobia. One example of internalized homophobia as a form of internalized humiliation was expressed by Eli, a 41-year-old, bisexual-identified man who "goes both ways," has an unknown HIV status, some high school education, works as a housekeeper and has a history of homelessness. Eli described his struggles with homophobia among his peers and the potential loss of social support if they were to learn of his sexual encounters with men.

> *If they ever known that I was gay or something like that, it would be a totally different relationship. You know what I'm saying? I mean they wouldn't even, they wouldn't even never be my friends any more …'cause they would think that "Hey, he's gay and he might try to hit on me and I'm not that type of peoples"…I don't think that gay, being gay is right because, you know, if the Lord wanted to make you a woman or a man he would have did that…that's why I really don't share my parts of my gay relationship that I have with myself with my straight friends.*

A majority of the men described coping with internalized homophobia by using substances during their sexual encounters with men. Moreover, many of these same men spoke about engaging in sexual risk behavior with men to support their substance use. It often appeared that risk reduction

strategies, including condom use, were the least of the men's concerns when they described how they navigated internalized homophobia and substance use and addiction. Remarks from Frederick exemplify common maladaptive coping strategies that the men described as part of their struggle with internalized homophobia. Frederick is a 47-year-old, straight-identified man with an undisclosed HIV status and a high school education who is unemployed and has a history of homelessness and incarceration.

> *I feel like I'm doing something wrong, you know what I mean? For some reason my conscience man, it be bothering me even after the [sexual] act is over with and I'm sitting there high and stuff. …Plus, when it first started, I got to be drunk or so much drunk or something, 'cause man, a man touching you feels gross. You know what I mean? So I numb myself with alcohol and drugs before anything even takes place… I just don't think mens supposed to be with men. When you out here, I don't know, if you are broke and you want some money, or sometimes, sometimes your addiction will lead you and stuff. You don't use the best judgment. But still, I still don't think it's right…sometimes it's really rough. Like I say, I just get high to try to forget it, that's how I deal with it.*

These maladaptive coping strategies used to manage the external and internal demands of homophobia may exacerbate the men's exposure to substance-fueled risk environments that put them at greater risk of HIV transmission.

As exemplified in the men's narratives, symbolic violence can be insidious because it is exerted by those who dominate and who are dominated. For example, incarceration is perceived by many as an ethical and reasonable response to criminal behavior, though many do not critically examine the social ramifications of this strategy or the disproportionate representation of poor people of color in the criminal justice system. Conversely, many of the men in this study articulated the links between structural and symbolic violence as it relates to poverty, inadequate legal representation and disproportionate incarceration of African American men. Participants also articulated the lack of social integration after prison release, leading to substance use and sexual risk behavior. However, none of the participants explicitly discussed the public policies that exacerbate a

community's shunning of former prisoners. Their reflections on sources of community-level homophobia and struggles with internalized homophobia were more ambiguous. Overall, however, the men's keen observations are not surprising despite the fact that the interview guide was not explicitly designed to elicit responses about larger social conditions and processes. In large part, the men's insights could be attributed to their limited access to different forms of power, which enable them to clearly observe and discredit the multiple forms of social, political and economic domination that they endure.

Everyday Violence

Symbolic violence can be a potent and pervasive form of violence in that it embeds in everyday practices and expressions of intrapersonal and interpersonal violence (191). In the present study, the men's experiences of everyday violence manifested into four sub-themes: (a) *unmet needs*; (b) *normalization of risk behaviors and contexts*; (c) *sexual silence*; and (d) *rigidity/constraint*. The men's experiences of everyday violence were pervasive as they responded to questions designed to unearth the pathways to their sexual risk behavior with men (191). Scheper-Hughes and Bourgois posit that persistent experiences of everyday violence intensify the misrecognition of political, structural and symbolic violence experienced by structurally vulnerable individuals and may foster "patterns of insecurity and competition", "definitions of respect", and maladaptive coping strategies that shape challenging interpersonal interactions and behaviors that are detrimental to one's health (193).

Unmet Needs

The vast majority of study participants described their sexual risk behavior with men as a means of meeting their substance use needs. A subset of the men also described having sex with men for money to purchase clothing and shoes in order to participate in an image-based consumer

society while they struggled to secure steady employment and housing. Gregory, for example, is a 37-year-old, bisexual-identified man who is unemployed, has an undisclosed HIV status, a high school education and a history of homelessness, substance abuse treatment, and incarceration. He described selling sex to men in order to meet women as potential sexual partners and companions.

> *I like to look good….and to look good I do what I do…So I got to do what I got to do to buy what I want to buy, to make me look how I want to look... Well, you got a woman that looks at a man like "Damn, you can't do a damn thing. You can't take me out. You can't do this or that." You know? If I didn't do those things [sexual exchange with men] then I would not be about to do those things for her so one benefits the other. You know what I'm saying? And that's basically how I keep the thing rolling… I really dig this female. It's not all about sex…I like to show my generosity and show that you know that I have, you know, I have a little bit of respect and I have some decency in myself to say "Ok, let's go out to a movie or I'll treat you to lunch one day."*

Gregory's description exemplifies a common sexual risk behavior described by a majority of the men and, in particular, the men with a history of homelessness, substance abuse treatment, and incarceration. While the interviewers asked the men if they had ever sold sex in order to obtain money or drugs, the prevalence and depth of experiences described by the men was not anticipated. Scheper-Hughes defined body commodification as "encompassing all capitalized economic relations between humans in which human bodies are the token of economic exchange"(194). On the continuum, I have characterized these narratives as everyday violence due to the level of commodification of the men's personhood and bodies to meet their unmet needs.

Normalization of Risk Behaviors and Contexts

One of the more salient expressions of everyday violence was the way in which sexual exchange for substances and/or money appeared to be normalized by the men. Moreover, it was common for the men to describe using substances as part of their sexual experiences with men as a normalized coping strategy. Normalization has been defined as "as a conscious, though unrecognized, process unlike the defense mechanism of rationalization" (195) where one compares and identifies with a reference group (196). It is suggested that, over time, individuals understand

that certain behaviors or life experiences are normal despite the adversity that may shape such behaviors and experiences (197). In particular, Frederick's words exemplify normalization of sexual risk behavior and his identification with the sexual exchange norms of his reference group.

> *I think I was locked up in penitentiary then, that's when I first tried somethin' crazy like that [having sex with a man], just to see if I would like it. 'Cause guys was doin' it and stuff, but I didn't really like it, you know what I mean? So I stopped doing it. Then, when I got outside prison, and got on drugs and stuff, it made it a little easier. So I would tell myself it would be okay…. the drugs made it easier. I don't know, seemed like when I was in prison and I tried havin' that I couldn't do that. I just couldn't do that. Then when I got out and I got to runnin' around, I met so many people that do this, you know what I mean? So many men, like men here. So many that do it and talk about it. "Man just get that money. Just don't think about it. Go on about your business." So that made it a little easier now.*

Frederick's remarks capture many of the men's normalization of their sexual exchange and substance use, which may hinder them from reflecting on their risk behaviors and formulating risk reduction strategies. The desperation surrounding a majority of the men's substance use also appeared normalized in their accounts of how substances often played a central role in organizing their daily lives. Such normalization and familiarity with these risk behaviors could lessen the men's perceptions that these behaviors may be harmful to their health. Rather than discussing concern for their health, participants were considerably more concerned about the perceived lack of peer acceptance for selling sex to men for drugs or money. In one particular example, Calvin provided insight into his willingness to discuss how he sells sex to men with a confidante who has also struggled with serious substance addiction.

> *People that talk about eating out of garbage cans 'cause they homeless, out there doing whatever they got to do, they understand. They understand how you can get into that type of [same-sex sexual exchange] relationship. Those are the people you choose, that you can talk to about it…'cause when you tell them about your having a homosexual relationship, they kind of know what you're going through. They tell you their own story and that it was the quickest way, you know, to make money. And that's what your entire story depends on, a quick way to make money.*

The men's normalization of selling sex for drugs or money may be a defense mechanism that protects them from reflecting on the dehumanizing experience of sexual exchange. I interpret

this phenomenon as both intrapersonal and interpersonal violence. Despite the pervasive narrative that normalized this behavior, as evidenced in Calvin's remarks, there was some desire to discuss their sexual exchange experiences with other men who had traversed similar pathways. Moreover, substance-based coping strategies may be understood as a form of intrapersonal violence. Both interpersonal and intrapersonal violence are forms of everyday violence that are often the most recognized forms of violence, yet are greatly magnified once the links to symbolic, structural and political forms of violence are elucidated.

Sexual Silence

Many of the men described a need to keep their sexual exchange behavior and sexual partner concurrency discreet. They described the potential loss of a female sexual partner if they were to disclose their sexual behavior with men or their concurrent male and female sexual partnerships. A majority of the same men also felt that their safety could be jeopardized if they talked to their peers about their sexual behavior with men. For example, Hank is a 39-year-old, straight-identified, HIV-negative man with some college education who works as a truck driver for a furniture company and has a history of homelessness, substance abuse treatment, and incarceration. Hank described how his community would respond and how sexual silence is a strategy toward survival.

> *In a black neighborhood? No. We kill somebody for that. That's the type of thing you want to take to your grave with you. But I seen, there's a lot of guys who do that, but they just won't say nothing. They are not going to walk up, I am not going to just walk up and say, "Hey, I just let a guy give me head."*

Throughout the interviews, the men did not describe norms about open sexual dialogue as evidenced by Hank's remarks. In the example that follows, Anthony explained how no men appear to disclose their sexual behavior and/or attraction toward other men.

> *It's hard to guess how people are accepting [of same-sex sexual behavior] because I know I never really tell the truth about it. I haven't known no one to be really honest about it… 'cause from my experience in dealing with people, and guys in general and women in general, and each one having, uh, you know, friends, best friends, girlfriends, boyfriends, ya know, associates, people to hang around with, do things with, but no one tells the truth...about their behavior or the way they feel.*

Many of the men also described the desire to be discreet about different sexual partners who were assisting them in meeting distinct needs. The following example from Gregory represents a subset of the men who reflected on the potential consequences of their sexual risk behaviors with multiple partners.

> *I don't work, don't have money. There are those necessities that I need. So basically, I have a male friend that you know, I engage in sex with him. And he, you know, gives me money in return, that way. That's just how I keep myself in clothes, shoes, things of that nature. And I would hate for her to find out that I actually, you know, engage with other men. Because, you know, I don't think she goes for that.*

Gregory expressed a related sentiment about his desire to appear sexually exclusive and present different sexual identities with his female and male sexual partners. This may, in turn, influence his respective partners' condom use and other sexual risk reduction strategies.

> *To her, I'm straight. I'm all about a woman. To them, I'm all about a man (laughs). If I told one about the other, then I'd lose that one. Because they think all they got is me, even though they might have others. But when it comes to me, they think all they got is me, you know? And I keep it that way.*

The men's narratives speak of social environments that are less conducive to expressions of open sexuality with few boundaries beyond informed consent and safer sex practices. This argument is underscored by the men's description of sexual silence as a strategy toward survival in their communities as well as the need for sexual partner discretion and perceived sexual exclusivity to meet their different needs. I interpret this phenomenon as everyday violence because a certain

level of risk taking and sexual norms violation is an exercise of sexual exploration with greater social and health-related consequences among the structurally vulnerable.

Rigidity and Constraint

Themes of rigidity and constraint associated with opportunity and social mobility emerged from the participant interviews. Struggles with rigid and constrained gender roles, sexual identity, and masculinity scripts underscore the men's unmet needs, normalization of risk behavior and contexts, and the need for sexual silence. Such struggles presumably operate as barriers to accessing health promotion and disease prevention interventions tailored for MSM and MSMW.

Early in the interview process, participants were asked, *"How do you personally identify yourself sexually?"* Some stated sexual identities, including gay, bisexual, and straight, while others provided behavioral or attraction-based descriptions such as "I go both ways," "I prefer women," or "bi-curious." Considering the perils of conflation between sexual identity, attraction, and behavior, responses to the aforementioned sexual identity interview question are organized into three categories in Table 5.2. The majority of participants described bisexual identity, attraction or behaviors. Participants were aware that reported sexual behavior with men and women was a study eligibility criterion which may have influenced their responses to this interview question. Nevertheless, some of the incongruences between the participants' sexual identity responses and their reported sexual behaviors and attractions during the remainder of the interview are noteworthy. For that reason, participants' responses to the sexual identity interview question have been presented when introducing selected quotations.

Table 5.2 Participant responses to sexual identity question (N=16)

	n	**(%)**
Gay, homosexual *Homosexual, gay*	2	(12.5)
Bi *Bisexual (4)* *Bisexual, go both ways* *Go both ways* *Bicurious* *Mostly women, with men, it's getting a high thing* *I prefer females, don't mind men*	10	(62.5)
Heterosexual (2) *Straight* *I like girls*	4	(25)

The majority of the men in the present study identified as straight and bisexual, and described receiving drugs from gay-identified men in exchange for sexual favors. Many of the men felt more comfortable describing themselves as the passive partner in oral sex and the active partner in anal sex, though some described engaging in receptive anal sex when they were under a greater influence of alcohol and drugs. They often described their own sexual activity with men as masculine, dominant, in control, and not as gay. While some of the men explained that an invitation to share drugs with another man or woman often implied an expectation to engage in some kind of sexual activity, many of the men described their first and subsequent sexual encounters with men in relatively naïve terms. They often reported being somewhat unaware of the other man's sexual interest in them. In the example below, Isaiah, a 36-year-old man who "goes both ways", is HIV negative, has a high school education, works as a cook, and has a history of homelessness, substance abuse treatment, and incarceration. He described how his sexual discretion is rooted in a desire to retain respect. He explained that his own acceptance of his sexual behavior with men is complicated by his understanding and maintenance of his masculine identity.

> *But I really prefer for them not to know about that side of me…I just can't see myself, and that is the manly part in me saying "Hell no, ain't going that far, you can receive but you better not give." And that's the manly part about me. That's why I said when I engage with*

him, it's him giving me as if it was a woman. But I am not that manly much of the time, right then and there. But when I get back with a woman - that just brings it all back together.

Rigid and constrained notions of masculinity appear to prevent some of the men from examining their attraction toward men, which may prevent them from formulating sexual risk reduction strategies. In particular, Anthony spoke about how other men are not accepting of their attraction towards men. He explained that men will use the need for drugs, money or clothes as an excuse for their sexual activity with men when actual attraction exists.

Let's say, you say "I want them boots or something."… 'Cause I was about to say a lot of people uses that as a way of saying that they would not engage in oral sex or homosexuality without it. But they put a price tag on it and say "Well, I am doing it because of money or drugs," right? But when really it is they are trying to make themselves think that or make you think it. But really, they wanna do it anyways. I went through it with my partner…they just use that as a pretext to make you think that they're not interested in you and that they don't engage in that…I just think they're not, they are not secure in their own self…they're not sure about their own feelings. It's a kind of cop out.

Similarly, Douglas, one of the few gay-identified men from the study, spoke about men who described their sexual identity as straight and their activity with men as merely sexual exchange for drugs or money in order to conceal their sexual attraction toward other men.

Some people, I just know them, they like men and women, or they may consider themselves heterosexual, but um they know they can go to this homosexual over here and get 50 dollars for sex. They go give him some sex, they get 50 dollars for sex. They get 50 dollars, 100 dollars or 200 dollars or, or a bag of weed or this or that…And then some of them, they say it's for that reason, but it's really 'cause they just want to do a man, but they don't want to admit they want to do him. I mean, it's just, there are so many grey areas when you are talking about men that deal with women and men… they all different shades of grey.

Many of the straight- and bisexual-identified men in the study spoke about their constrained sexual identities despite the absence of interview questions that explicitly explored incongruences between sexual identity, attraction and behavior. In the following example, Frederick reconciled his own struggles by compartmentalizing his sexual identity and behavior with men and women.

> *I would call myself straight. I don't think I'm a gay man. I do it just to get high. Know what I mean? So it's a pay-off thing, a money thing, so that's the only reason.*

And lastly, the men's constrained ability to ensure their good health and well-being in the face of substance use was ever-present. This is illustrated by Calvin's acknowledgment of his risk behaviors and lack of self-efficacy toward adopting risk reduction strategies.

> *I ain't got no control. I can't make no decisions. I'm just following, where the dope tells me. "Go!" I'm goin'. I ain't talking to nobody, don't want nothin' to do with nothin'. Don't know what day it is. I'm still catchin' up now! I don't have a lot. I don't have nothin'. With a stable relationship, at least you can make some choices. My drug use, I can't make no choices. It takes me where it wants. Man, I've been done gone to so many places over this drug use.*

The same men often described future-oriented aspirations while acknowledging challenges to maintaining their resilience. Hank used a geo-political metaphor when discussing the perils of crossing his own private Mason Dixon Line. He illustrates how crossing the boundary into a deeper degree of substance addiction would symbolize crossing over to a place of greater desperation and lowered social status that would reduce his prospects of self-determined well-being. By way of explanation, he is stating that he does not want to be enslaved by his addiction.

> *You go past the Mason Dixon Line right here. So y'all at the line, but not on the line. On the line is down at the church and the store. You've been down there…Those guys, they stay down there forever and ever and ever. And I know what I am. And I'm going to do, to try to keep at least, I still keep my memory of the way I was raised. Some of them just forget, like they just don't care anymore. But I ain't going to give up, because I know it's going to get better for me.*

While exploring the social conditions that shape the men's intersecting sexual and substance-using norms and behaviors, emergent themes called attention to lives profoundly marked by everyday violence. Using the four sub-themes as support, I argue that daily practices and expressions of intrapersonal and interpersonal violence reproduce historical inequities and contribute to a disproportionate HIV and STI burden among structurally vulnerable individuals. As Scheper-Hughes

states, “violence comes to mark the bodies of the vulnerable, poor and disenfranchised with a terrifying intimacy” where the “the insidious invisibility of everyday violence…often makes the vulnerable and exploited into their own wardens and executioners”(191).

5.4 DISCUSSION

The purpose of this qualitative study was to contribute to the growing knowledge base on how social conditions shape sexual norms and risk behavior among African American MSMW. Qualitative inquiry is especially appropriate for disentangling the dynamic political, economic and social forces and processes that shape sexual risk behavior. The present study focused on a highly marginalized sub-group of African American men about whom little is known and who have received little systematic public health attention. The study addresses gaps in the literature which may inform sexual risk reduction interventions that are socially and culturally relevant to men similar to those who participated in this study. The results may also provide insights that guide the development of policies that are context sensitive.

The structurally vulnerable African American MSMW who participated in this study resides in social environments that are not supportive of HIV/STI prevention behaviors. Among the men in the study who were attracted to other men, there appeared to be little space for them to be themselves. Among the men who did not appear to be sexually attracted toward other men, yet engaged in sexual exchange for drugs or money, there appeared to be limited opportunities to meet their basic needs that did not necessitate the commodification of their bodies. Furthermore, a greater understanding of the social conditions that shape the incongruences between sexual identity, attraction and behavior were made clearer by the men’s narratives. However, rather than focusing on reconciling sexual incongruences, there is a more urgent need to understand and address the persistent influence of violence on masculine identity that appears to be negatively impacting these men’s sexual health.

With regard to the social conditions that shape the intersecting sexual and substance-using norms and behaviors that place structurally vulnerable men at risk for HIV and other STI, the present study found that their exposure to violence, ranging from personal addiction, assault, and incarceration to institutional racism and homophobia, shaped their sexual behaviors. The narratives of historical and present-day violence described by the men suggest that these experiences take on dynamic and dramatic meaning in their lives and that sexual risk behavior is a reasonable response to such micro and macro forces over time. The political, structural, symbolic and everyday violence experienced by the male participants have stripped them of their most basic role as integrated members of society. In an effort to reach their masculine ideal, these men engage in sexual risk behavior to negotiate social status and power despite the cost of undermining their health. These findings are consistent with Whitehead's description of men's cultivation of respect and reputation through sexual prowess when economic capacity and sociopolitical power are scarce. As social actors, the men's sexual risk behavior is reflective of the social marginalization that defines their lives and what Whitehead refers to as "fragmented masculinity" (152).

The men's sexual risk behaviors with other men were nearly always discussed in a manner to suggest that these behaviors are necessary coping strategies exercised by men living on the margins of society. Consistent with Harawa and colleagues' work establishing the role of substance use as motivation and justification for sexual behavior with men (63), the use of substances by the men in this study was described as an outgrowth of, and often a necessary part of, their sexual experiences and partnerships with men. However, these maladaptive coping strategies do not support the formulation of risk reduction strategies, including condom use, serosorting and strategic positioning that could ease the disproportionate HIV and other STI burden faced by high-risk, African American, substance-using MSMW.

The study participants' overwhelming personal experiences of incarceration and the associated impact on their home communities are consistent with a large body of evidence documenting the correlation between incarceration and HIV infection (20, 67, 82, 198, 199). It has been estimated that elevated rates of incarceration result in destabilization of communities and contribute to a significant increase in STI infections (200). It is estimated that, among African American men ages 20-34 in the US, one in nine are incarcerated. This statistic alters gender ratios and affects sexual partner concurrency, which prompts a desire for companionship as well as economic necessity (200).

It is possible that emergent themes, which were interpreted using the Continuum of Violence framework, did not meet saturation due to the relatively small sample size and the large number of domains of inquiry contained in the interview guide (201). Additionally, it is possible that there was no participation among MSMW who experience discomfort discussing their sexual behavior with men or who did not disclose the necessary sexual risk behaviors at the time of screening. This may limit the relevance of the findings to the design of interventions that are only amenable to men who are willing to discuss their sexual risk behaviors with men. Lastly, the present study utilized purposive sampling. Therefore findings cannot be generalized to other structurally vulnerable, African American, substance-using MSMW, though they may provide insights for the direction of further research and practice.

The study intended to make the social worlds of African American, substance-using MSMW increasingly visible for public health promotion and disease prevention efforts. Their social vulnerability exposes them to multiple forms of violence that may shape the men's identities as substance users, low-income individuals, and as African American men rather than as a gay or bisexual. The role of masculine identity construction in sexual health behavior deserves further

inquiry, especially as it pertains to how the men's performance and evaluation of their social roles may shape their risk behaviors. This study also revealed how current HIV prevention-related research can inadvertently reinforce biases based on race/ethnicity, class and sexuality by highlighting intrapersonal and interpersonal forms of violence, including substance abuse, non-disclosure of high risk behaviors to sexual partners and falsification of sexual exclusivity, which the men in the present study described. As a consequence, the HIV epidemic is often interpreted as produced by 'dishonest' men rather than examining and intervening upon broader social conditions. David Malebranche aptly frames this polemic when he states that "often the discussion begins with the high rates of HIV/AIDS among heterosexual black women, in which bisexual Black men are viewed as unidirectional predators and 'vectors of transmission' of HIV from the homosexual community to an unsuspecting heterosexual female community. While this pejorative generalization of bisexual behavior among black men is common, the positive and affirming aspects of bisexual behavior and identification, and the extent of their role in this HIV epidemic deserves a much deeper exploration than is currently available" (24) .

Further research should expand on other *unmet needs*, including employment, physical safety, social support, and models of constructive conflict resolution. Greater understanding of *normalization of risk behaviors and contexts* that examine the intersections of substance use, incarceration, sexual exchange, other sexual risk behavior deserve more attention. Also, the role of *sexual silence*, including non-disclosure of same-sex sexual behavior, sexual concurrency should be explored as they relate to context-specific sexual risk reduction strategies. Finally, the role of *rigidity and constraint* on gender roles, sexual identities, sexual exploration, and social mobility should be examined using the Continuum of Violence Framework in tandem with a broader understanding of the macro-level forces shaping ideal masculine identities that may undermine men's health.

This cautionary note calls attention to the need to explore macro-level inequalities fueling sexual exchange, substance abuse. One way is by learning more about norms formation and maintenance within social networks in order to foment peer- and network-based opportunities where African American substance-using MSMW are able to create their own risk reduction strategies that preserve and enhance their masculinity, create a space for positive exploration of their sexuality and enhance their positive roles in society. In order to inform socially relevant and context-specific peer- and network-based interventions, we must examine the relationship between the composition and social support function of African American men's social networks. We must also examine the relationship between African American men and their sexual partners with whom they engage in protected and unprotected sex in order to better understand selective risk-taking and other partnership dynamics. Lastly, additional research and future interventions should take place within the criminal justice system, vocational training programs, substance treatment centers, homeless shelters, and other places where African American, substance-using MSMW are disproportionately represented.

CHAPTER 6. MANUSCRIPT 2

The influence of personal networks and sexual dyad characteristics on the sexual risk behavior of structurally vulnerable, African American, male substance-users in North Carolina

6.1 INTRODUCTION

The HIV/AIDS epidemic is one of the most pressing public health problems faced by African American communities in the US. These communities are also disproportionately burdened by other sexually transmitted infections (STI) including syphilis, chlamydia and gonorrhea (36, 37). African Americans comprise 13% of the US population (1), yet they represented 45% of new HIV infections in 2006 (2). HIV is the second leading cause of death among African Americans (202), who are diagnosed at more advanced HIV disease stages and experience the shortest survival after an AIDS diagnosis compared to other racial/ethnic groups in the US (4). In 2006, the HIV incidence for African American men was two times as high as that of African American women and six times as high as that of white men (5). In North Carolina, HIV incidence for African American males aged 13 and older was eight times greater than for white males in the same age range as of 2010 (203). Similar to national surveillance data, 61% of all North Carolina men living with HIV attributed their HIV infection to sexual activity with men. Furthermore, 18% of North Carolina males living with HIV reported using non-injection drugs and 2% of men reported exchanging sex for drugs or money (203).

Despite a decline in HIV infection rates in the US, African American men have experienced an increase in HIV incidence for more than a decade (4). While HIV infection is most often associated with sexual activity among men who have sex with men (MSM), incidence rates have

increased among heterosexual populations who engage in sexual exchange (46, 204). Mounting evidence suggests that structurally vulnerable, substance-using, African American men are disproportionately selling sex to men and women for drugs or money (10, 11, 21, 25, 126). Structurally vulnerable individuals occupy social positions that are historically and disproportionately burdened by economic exploitation and multiple forms of discrimination (6). In public health research, these individuals are most often characterized as having limited formal education, a low income, a history of incarceration, and are unemployed or underemployed (7).

The sale of sex for drugs or money is a co-occurring risk behavior with unprotected sex (14). Preliminary evidence suggests that men and women who report sexual exchange experience comparable rates of unprotected sex with exchange and non-exchange partners (10). Regional and national studies have demonstrated greater HIV seroprevalence among men and women who engage in sexual exchange (8-14). Exchange, or transactional sex, has been defined as the trading of sex for drugs, money, other goods, or shelter (10, 15). In many cases, drugs and sex are considered direct currency (16). Sexual exchange is not merely a survival or subsistence-oriented behavior, but it may be considered a normalized strategy for material gain in resource-limited communities (17, 18). Commercial sex work, which is a subcategory of sexual exchange and not the focus of the present study, is more often considered a primary income-generating activity occurring in more delineated spaces, such as brothels and street corners (10). It is more difficult to define and intervene upon less commercial forms of sexual exchange. The distinction between casual and exchange sexual partnerships is often unclear (10), which may make the negotiation of condom use more difficult. The determinants of sexual exchange from the seller's perspective is not clearly understood, although it is assumed that individuals selling sex in this context have less power to dictate condom use with sexual partners who

are purchasing sex from them. Greater risk taking is also assumed to take place under the influence of substances during sexual exchange.

Consistent correlates of selling sex among African American men include alcohol and drug use (8, 10, 11, 13, 21, 126, 130-132), injection drug use (IDU) (22, 131, 132), multiple sexual partners (10, 42, 205), male sexual partners (10, 21, 25, 125), unprotected vaginal and anal intercourse (UAI) (10, 19, 22, 126, 132), sexual partner concurrency (12), non-gay identity (22, 131) and various socioeconomic factors associated with poverty. Specifically, a history of incarceration (20, 21) and a history of homelessness among drug users are predictors of selling sex (10, 21, 131, 133). Multiple studies have found that African American men who have sex with men and women (MSMW) are more likely than African American MSM to report sexual exchange (19, 25, 125, 126). There is also evidence that African American MSMW report more sexual exchange, IDU, drug use during their last sexual event, lifetime sexual partners, unprotected sex with female primary partners, and primary partners of unknown HIV serostatus than African American MSM and men who only report having sex with women (MSW) (132). Similarly, in a study conducted in the Raleigh-Durham area of North Carolina, MSMW who engaged in sexual exchange were more likely to be African American, report having been homeless, and engage in recent IDU (21). Overall, MSMW in this study were more likely to report sexual exchange for drugs or money than MSM (21), and indicated a greater frequency of UAI with their female sexual partners when compared to MSW (126).

Research has demonstrated the effects of social network composition on health behaviors including sexual exchange (78), condom use, needle sharing, smoking tobacco (11, 72-74), and HIV risk perceptions (75). In one study, drug-users who engaged in sexual exchange reported a higher number of crack smokers and a lower number of family members in their social networks (98). Costenbader et al. assessed changes in the composition of IDU networks enrolled in an intervention study. At intervention

follow-up, participants who reported a new set of drug-using members in their networks were more than three times as likely to engage in sexual and substance-related risk behavior. Conversely, participants who reported all new network members, who were not drug users, were less likely to engage in sexual and substance-related risk behavior (81).

Sexual and drug-use behavioral norms can be formed and maintained within social networks (76, 77). Conversely, individuals select into social networks with similar knowledge, attitudes, beliefs and behaviors (76). Davey-Rothwell and colleagues found that female IDU networks were more likely to engage in sexual exchange for drugs or money if they believed that their peers endorsed this sexual risk behavior (78). Latkin and colleagues examined the influence of peer condom use norms in a predominantly African American drug-using community. Fewer of the respondents who injected drugs had peers who they perceived to endorse condom use. The authors also found that respondents with the greatest perceived access to health advice and financial support within their networks were the most likely to report condom use and supportive norms (11). In another study, Latkin and colleagues categorized predominantly African American IDU networks into four risk levels and examined the association with various HIV risk behavior norms (79). IDU among the riskiest networks (where multiple members shared needles) were the most likely to perceive their peers as supporting sexual exchange and needle-sharing practices. This relationship was further pronounced among males. In contrast, the mid-level risk networks of IDU (where multiple members shared cookers but did not share needles) were less likely to endorse drug and sexual risk behavioral norms.

The provision and receipt of social support within social networks may influence health-promoting and health-damaging behaviors (114-116). Receipt of social support has influenced the retention of African American and Latino MSMW in HIV care (114). Knowlton et al. also found greater HIV disease management among IDU who were able to mobilize sources of social support (83). Low peer

support has been associated with UAI among African American and Latino MSM (117). Among drug users, receipt of social support has been associated with engaging in HIV risk behavior (116) as well as HIV prevention behavior (72, 118). This contradiction may exist because the receipt of social support from a higher risk individual may influence a recipient's decision to engage in risk behavior (118). Furthermore, the nature of substance users' income- and drug-generating strategies "mandate risky practices" within their social networks, where sharing drugs and exchanging sex for drugs or money may result in and be a result of "reciprocal debt obligations" (119). Substance users may place a burden on their peers with the high need for instrumental and emotional support which, in turn, may limit their peers' ability or willingness to provide support, or may limit the substance users' willingness to accept the support that is offered (120).

Using personal network surveys completed with a population of African American substance-using men in North Carolina, the present study comprised a secondary data analysis to explore the influence of personal network composition and the social support function on selling sex for drugs or money. I then examined the influence of sexual partner dyad characteristics and social support to better understand selective risk-taking with regard to unprotected sex.

6.1.1 Theoretical Framework

Social Influence Network Theory informed the focus on the composition of social networks as influential on the sale of sex for drugs or money (154). Social networks can be a place of conflict since prevailing norms are tested and social control is exercised. The theory recognizes the role of social control within sub-groups that may detour from larger processes of normative integration. Social networks are also the context in which social support is derived, resources are exchanged, behaviors are learned, and social identities and roles are formed (142). Social support is characterized as the cognitive appraisal of feeling reliably connected to others and benefitting from individual and

community-level resources that buffer the effect of stressors (155, 156). However, receipt of social support is associated with a sense trust, reciprocity, and obligation that may complicate shared behaviors, such as injection drug and condom use (116, 118, 119, 123, 161). Lastly, Interdependence Theory informed the inclusion of characterization of sexual partner dyads. Interdependence Theory examines how the characteristics and shared experiences of individuals within a dyad influence their patterns of behavior. The basic premise of this theory is that the perceptions, assumptions or goals of the dyad in a given situation determine how a dyad will interact and behave (162).

The current study, therefore, was guided by the following hypotheses:

Aim 1: To test the strength of the relationship between the composition and social support function of the African American male respondents' social networks and their sale of sex for drugs or money.

Hypotheses: (1) African American men with a higher proportion of peers with a history of incarceration, who are drug partners, or sexual partners, are more likely to sell sex for drugs or money; (2) African American men with a higher proportion of employed peers are less likely to sell sex for drugs or money; and (3) African American men with a greater proportion of peers who are considered source of emotional, instrumental, or informational support, in general, or appraisal support about discontinuation of respondent drug use, are less likely to sell sex for drugs or money.

Aim 2: To examine the relationship between dyad characteristics and social support function and unprotected sex among the African American male respondents' and their nominated sex partners.

Hypotheses: (1) African American males who describe their sexual partners as primary sexual partners or drug partners are more likely to engage in unprotected sex than African American males who do not characterize their sexual partners in these ways; and (2) African American men who consider their sexual partners as a source of emotional, instrumental, or informational support, in general, or appraisal support regarding discontinuation of respondent drug use, are more likely to engage in unprotected sex

with these sexual partners than African American males who do not describe their sexual partners as sources of social support.

6.2 METHODS

The present study comprised a secondary data analysis of surveys completed with 201 African American men from the Sexual Acquisition and Transmission Cooperative Agreement Program (SATH-CAP) network study. The parent study was funded by the National Institute on Drug Abuse. Survey data were collected from 2007 to 2008 in Raleigh, Durham, Siler City and Smithfield, North Carolina.

6.2.1 Sampling, Recruitment & Eligibility

The network study seed respondents were a subset of individuals who were already enrolled in the main SATH-CAP study. The main study respondents were recruited and connected via respondent driven sampling (RDS). The main study eligibility criteria varied by behavioral risk group, which included substance use in the past six months, anal sex with a man in the past six months, or sexual partnership with the respondent-turned-recruiter in the past six months. Substance users had to report heroin, powder cocaine, crack cocaine, methamphetamine or injection drug use during this time period to be eligible.

Main study respondents having characteristics associated with HIV risk were identified, selected, and recruited to participate in the network study. These characteristics included the results of the HIV and STI lab tests, biological sex, race/ethnicity, age, county of residence, sexual activity, and substance use behavior. Forty-five network seeds were selected at random after identification from the RDS-based main study and snowball sampling were employed to populate the network study sample.

Study recruitment and enrollment continued as a two-step path from the seed respondents. Specifically, each seed respondent could nominate up to 24 individuals into their personal network inventories. Using an incentive-based coupon system, nominees were then invited by the seed

respondent to participate in the network study as the first wave. First wave respondents could nominate up to 24 individuals into their personal network inventories for subsequent recruitment, and second wave respondents could nominate, but not recruit, up to 24 individuals into their personal network inventories. These efforts resulted in survey responses from 484 male and female respondents from African American, Latino and white racial/ethnic backgrounds.

Survey responses were selected from the largest subset of respondents consisting of 201 African American male seeds, first wave, and second wave respondents. The African American male seeds and first and second wave respondents nominated a mean of 3.95 individuals into their personal network inventories. A mean of 1.62 individuals were identified as sexual partners within the personal network inventories. For the second study aim, responses from the 201 African American male respondents were converted to a dyadic dataset so that each observation represented the respondent and survey items for each nominated peer who was identified as a sexual partner, which resulted in 229 sexual partner dyad observations.

6.2.2 Data Collection

Study staff used computer-assisted personal interviews to complete the personal network inventories with the respondents. The respondents then used audio computer-assisted self-interviewing (ACASI) to report their own demographic characteristics, sexual and substance use behaviors, and characteristics of and behaviors with their nominated peers. The laptops had touch screen technology and the survey was formatted with check box answer options, requiring minimal literacy. The survey was approximately 45 minutes in length, depending on the number of peers nominated into the respondents' personal network inventories.

Written informed consent was obtained from each respondent prior to study enrollment. Respondents were compensated for participating in the study and for successful recruitment and

participation of nominated peers into the network study. The Institutional Review Board (IRB) of RTI International (RTI) approved the network study and the IRB at the University of North Carolina at Chapel Hill approved this secondary data analysis. RTI also acquired a certificate of confidentiality for the study.

6.2.3 Measures

For the first study aim, the primary outcome variable, sale of sex for drugs or money, was measured dichotomously. This primary outcome variable was asked in a general manner and not for each nominated sexual partner. Questions regarding all explanatory variables were asked for each nominated peer. The network composition variables included peer history of incarceration, part- or full-time employment, drug use partnership, and sexual partnership. The social support function variables were measured using House's taxonomy of emotional, instrumental, informational, and appraisal support (see Table 6.1). For this study, appraisal support regarded discontinuation of respondent drug use.

Table 6.1 House typology of social support (156)

Emotional Support	Expressions of empathy, love, trust, and caring
Instrumental Support	Tangible aid and services
Informational Support	Advice, suggestions, and information
Appraisal Support	Information that is useful for self-evaluation of behavior

Proportions were calculated for the number of peers who possessed the compositional characteristics over the total number of peers in the respondents' personal network inventories. With the exception of emotional support, social support variables were also measured dichotomously and proportions were calculated in the same manner. The calculated proportions were then treated as continuous variables for analysis. The emotional support variable was measured using a scale from one to ten where one signified 'not close at all' and ten as 'the closest'. A mean score was then calculated

based on the scores given for each of the respondents' peers. The mean score was treated as a continuous variable for analysis.

For the second aim, the outcome variable, unprotected sex, was measured and analyzed dichotomously for the respondents in relation to each of their nominated sexual partners with whom they had been sexually active in the past six months. A distinction between unprotected anal and vaginal sex was not measured. While UAI may be a more efficient route of HIV transmission, co-infection with an STI greatly increases the efficiency of HIV infection during vaginal sex (166). Additionally, among high risk populations, there is empirical evidence demonstrating UAI regardless of the biological sex of the sexual partner (10, 19, 103, 126).

The sexual partner dyadic characteristics included sexual partnership, drug partnership, and biological sex concordance. Any sexual partner described as a main partner, girlfriend, boyfriend or spouse was considered a primary sexual partner and all other types of relationships were considered as 'other'. Any sexual partner described as using drugs with a respondent within the past six months was considered a drug partner. Lastly, none of the respondents identified as transgender nor were any of the sexual partners described as transgender. Therefore, biological sex concordance between respondents and their sexual partners were treated dichotomously as male (concordant) or female (discordant).

The same four social support variables from the first study aim were modeled as predictors, this time as risk factors, in the dyadic analyses. For each nominated sexual partner, the respondent provided an emotional support score and dichotomous responses for the three other social support items. The emotional support variable was measured using a scale from one to ten and treated as continuous for analysis. The three other social support variables were measured dichotomously. Responses to the dyad

characteristic and social support variables were not confirmed by the nominated sexual partners due to limited participation of nominated peers in the study.

6.2.4 Analysis

For the first study aim, univariate logistic regressions with generalized estimating equations (GEE) were conducted to model the unadjusted association between each of the eight continuous explanatory variables in relation to reported sale of sex for drugs or money. Then, each explanatory variable was tested for the assumption of linearity with respect to the logit. A threat of misspecification was addressed by adjusting for the curvilinear effect of two explanatory variables, dichotomizing one explanatory variable, and trichotomizing another explanatory variable to reflect the effect of distinct conditions on the outcome variable, reported sale of sex for drugs or money.

GEE multivariate analyses were conducted in full and best models after adjusting for potential confounders. Explanatory variables significant at $p \leq 0.10$ in the unadjusted univariate analyses were selected for entry in the adjusted best model to assess the contribution of each covariate. In order to limit the number of parameters during modeling, continuous variables were retained in their original form when possible. Similar statistical analyses were conducted for the second study aim. Univariate and multivariate logistic regression models with GEE were used with the same cluster factor. Six of the seven explanatory variables were dichotomous and referent groups were informed by relevant literature and empirical evidence.

In this sample, observations are non-independent due to snowball sampling and personal network inventories completed by each respondent (Aim 1) and the dyadic pairs (Aim 2). Clustered data violate the assumption of independence between observations, which affect standard errors in a statistical model and may increase the potential for a Type 1 error. Therefore, logistic regression models with GEE were used to control for this source of correlation for the egocentric network and dyadic

datasets. An exchangeable matrix was employed where correlations between all observations were assumed equal (176). This analytic approach is intended to produce robust standard errors. Network study seed chains were used as the cluster factor to study the influence of seeds on subsequent responses to the explanatory and outcome variables among the first and second wave respondents. There were 17 African American male network seeds who recruited African American men into the study. There were also first and second wave respondents who were recruited by 11 other network seeds who were not African American males. Therefore, 28 seed chains were accounted for using GEE and estimates were obtained using a link function (177) and the Huber-White correction (178, 179) since this approach provides valid parameter estimates for data that is non-independent (124, 180). All p values were two-tailed tests. For the full and best model, significance was set at $p \leq 0.05$. All analyses were conducted using SAS v.9.3 (SAS, Cary, NC, USA).

6.3 RESULTS

6.3.1 Description of Respondents

Demographic and other HIV-related characteristics of the sample related to the first study aim are described in Table 6.2. All respondents were male and all but two men identified as black or African American. The remaining two men identified as mixed racial/ethnic identity of African American and Latino descent. The median age of the respondents was 42.28. A small portion of the men also participated in the main SATH-CAP study. One quarter of the respondents reported having injected drugs and slightly more than half reported a history of substance use treatment. Eighty-four percent of the men reported having been arrested, and over half reported a history of incarceration. The median number of sexual partners reported in the past 30 days and past six months were both two. Among the 151 respondents who nominated sexual partners as part of their personal network inventories, nearly one half of the men reported having at least one more sexual partner one year ago who was not

included in their current inventories. Nearly one fifth of the respondents reported having sex with men, including men who had sex with both men and women. The vast majority of men reported a negative HIV serostatus, 8.5% of the men reported living with HIV, and 6% did not disclose their HIV serostatus.

Table 6.2 Characteristics of study respondents (N = 201)

		(%)
Age		
Mean (SE)	42.23	(0.70)
Median	42.28	
Range	18.62 – 67.11	
Total number of sexual partners in past 6 months		
Mean (SE)	3.08	(0.228)
Median	2.0	
Range	0 – 25	
Don't know	3	(1.5)
Refuse to answer	5	(2.5)
Not recorded	1	(0.5)
	n	**(%)**
Biological sex		
Male	201	(100)
Race/Ethnicity		
African American non-Hispanic	199	(99.0)
Mixed (African American and Latino/Hispanic)	2	(1.0)
Participated in main study		
No	188	(94.5)
Yes	13	(6.5)
Seed respondent for network study		
No	184	(91.5)
Yes	17	(8.5)
Ever injected drugs		
No	150	(74.6)
Yes	51	(25.4)
Ever arrested		
No	32	(15.9)
Yes	169	(84.1)
History of incarceration		
None, never been to prison or jail	17	(18.5)
Less than 1 month	22	(10.9)
1 month to 1 year	32	(15.9)
More than 1 year	36	(17.9)
Don't know	3	(1.5)
Not applicable or not recorded	91	(45.3)

Sexual behavior		
I have sex only with men	8	(4.0)
I have sex mostly with men, but occasionally with women	6	(3.0)
I have sex with about equal numbers of men and women	5	(2.5)
I have sex mostly with women, but occasionally with men	20	(10.0)
I have sex only with women	160	(79.6)
Refuse to answer	2	(1.0)
1 year ago, any sexual partners not named in the personal network inventory		
No	75	(49.7)
Yes	72	(47.7)
Not recorded	4	(2.6)
Respondent did not nominate any sexual partners	50	n/a
HIV serostatus		
Negative	172	(85.6)
Positive	17	(8.5)
Refuse to answer	12	(6.0)

6.3.2 Description of Personal Network Composition and Social Support Function

A description of the average proportion of peers with the composition and social support function variables are shown in Table 6.3. All variables were reported from the respondents' perspective. On average, one fifth of the respondents reported that their peers had a history of incarceration and one third of peers were identified as employed full- or part-time. The average proportion of respondents identified as drug partners was 59% and the average proportion of peers identified as sexual partners was 42%. The mean score across all of the respondents' personal networks for emotional support was 6.1 on a scale from one to ten. The average proportion of peers identified as sources of instrumental and informational support was both approximately one quarter. The average proportion of peers that were identified as a source of appraisal support regarding discontinuation of respondent drug use was 5%.

Table 6.3 Mean proportion of peers with personal network composition and social support function variables (N = 201)

	Mean	(SE)	Medium	Range
Composition				
History of incarceration	0.21	(0.02091)	0.00	0 - 1
Employed	0.37	(0.02574)	0.29	0 - 1
Drug partner	0.59	(0.02846)	0.67	0 - 1
Sexual partner	0.42	(0.02451)	0.40	0 - 1
Social Support Function				
Emotional support	6.10	(0.16247)	6.33	1 – 10
Instrumental support	0.28	(0.02206)	0.20	0 – 1
Informational support	0.25	(0.02108)	0.20	0 – 1
Appraisal support	0.05	(0.00942)	0.00	0 - .75

6.3.3 Correlates of Selling Sex for Drugs or Money

Twenty-eight percent of the men reported selling sex for drugs or money. Results from the univariate analyses related to selling sex for drugs or money are reported in Table 6.4. Each model was adjusted for correlated outcome data. As hypothesized, the likelihood of selling sex for drugs or money was significantly higher for respondents with a greater proportion of peers having a history of incarceration. Specifically, for every one-unit increase in the proportion of peers with a history of incarceration, respondents were more than 45 times as likely to report selling sex for drugs or money (OR = 45.25**,** 95% CI: 1.58 1296.08). However, this finding must be interpreted with caution due to the curvilinear effect of this variable on the outcome variable. Peer employment was protective toward this HIV risk behavior and operated in the direction hypothesized. Compared to respondents with a small to moderate proportion of peers who are employed, there is an expected 69% decrease in the odds of respondents reporting the sale of sex for drugs or money who have a large proportion of peers who are employed (OR =0.31, 95% CI 0.14 0.69).

The proportions of drug partners and sexual partners in the respondents' personal networks were not statistically significant predictors. Next, the four variables selected to measure the influence of

social support were assessed. However, emotional, instrumental, and informational support, in general, and appraisal support regarding discontinuation of respondent drug use, were not significant predictors of the respondents' sale of sex for drugs or money in the univariate analyses.

Results from the multivariate analyses predicting the sale of sex for drugs or money are also reported in Table 6.4. The non-significance of drug partner, sexual partner, and the four forms of social support in the univariate analyses made these variables candidates for omission in the best model. The best model included history of incarceration and current employment, which were statistically significant in the univariate analyses at $p \leq 0.10$. After adjusting for correlated outcome data and controlling for respondent-educational attainment, employment status, housing status, monthly income, number of sexual partners, history of arrest, injection drug use, and substance abuse treatment, the proportion of peers with a history of incarceration did not remain a significant predictor. The proportion of employed peers remained a protective factor in the best model. Specifically, compared to respondents with a small to moderate proportion of peers who are employed, there is an expected 70% decrease in the odds of respondents reporting the sale of sex for drugs or money who have a large proportion of peers who are employed, given that other variables in the model are held constant (OR = 0.30, 95% CI: 0.17 0.56).

Table 6.4 Unadjusted and adjusted odds ratios for selling sex for drugs or money (N = 201)

				Full Model			Best Model		
	OR	**95% CI**	***p***	**AOR**	**95% CI**	***p***	**AOR**	**95% CI**	***p***
Intercept	--			0.08		0.006	0.48		0.013
Composition									
History of incarceration^	**45.25***	(1.58 1296.08)	0.026	14.42	(0.18 1151.34)	0.232	10.19	(0.14 738.60)	0.288
Employed									
Small/Moderate	Ref		--	Ref			Ref		-
Large	**0.31***	(0.14 0.69)	0.004	0.17	(0.08 0.39)	<.0001	**0.30***	(0.17 0.56)	0.0001
Drug partner	1.00	(0.54 1.84)	0.990	0.61	(0.27 1.39)	0.242	--		
Sexual partner^	7.36	(0.32 167.41)	0.525	1.82	(0.59 5.55)	0.296	--		
Social Support Function									
Emotional support	1.01	(0.92 1.11)	0.852	0.92	(0.78 1.08)	0.292	--		
Instrumental support									
Small/Moderate	0.96	(0.57 2.59)	0.940	7.28	(1.16 45.60)	0.034	--		
Medium	1.08	(0.28 4.18)	0.910				--		
Large	Ref		--	--		--	--		
Informational support	1.60	(0.57 4.46)	0.372	0.78	(0.17 3.51)	0.748	--		
Appraisal support	1.77	(0.28 11.08)	0.539	0.61	(0.12 3.03)	0.548	--		

6.3.4 Description of Respondents' Sexual Partners

The demographic characteristics of the respondents' nominated sexual partners are described in Table 6.5, which are reported from the respondents' perspective. The median age of participants' sexual partners was 35. The majority of sexual partners were female and African American. Nearly one third of the sexual partners were described in a manner that placed them in the primary sexual partnership category (i.e., main sex partner, boyfriend/girlfriend or spouse). The perceived HIV serostatus of sexual partners was not collected for all nominated sexual partners due to an ACASI data collection error. Notably, among the 82 available responses, nearly two-thirds of the respondents reported that they did not know their sexual partners' HIV serostatus.

Table 6.5 Characteristics of the respondents' sexual partners (N = 229)

		(%)
Age		
Mean (SE)	35.34	(0.569)
Median	35	
Range	17 - 60	
	n	**(%)**
Biological sex		
Female	205	(89.5)
Male	24	(10.5)
Race/Ethnicity		
African American	182	(79.5)
White	35	(15.3)
Other	8	(3.5)
Not recorded	4	(1.7)

Sexual Partnership Type			
Main sex partner	Primary sexual partnership	26	(11.4)
Boyfriend/girlfriend		33	(14.4)
Spouse		12	(5.2)
Sex partner		108	(47.2)
Friend		35	(15.3)
Acquaintance		12	(5.2)
Neighbor		1	(0.4)
Roommate		1	(0.4)
Other		1	(0.4)
HIV status			
Negative		22	(9.6)
Positive		6	(2.6)
Don't Know		54	(23.6)
Refuse to Answer		4	(1.7)
Not recorded		143	(62.4)

6.3.5 Sexual Partner Dyad Characteristics and Social Support Function

A description of the dyad characteristics and social support function variables used to model unprotected sex within sexual partner dyads is described in Table 6.6. Variable responses are reported from the respondents' perspective. As previously described, nearly one third of the sexual partners were described as primary sexual partners. Sixty percent of the sexual partner dyads used drugs together in the past six months. This is consistent with the mean proportion of drug partnership across all personal network inventories. Only 10% percent of the respondents nominated male sexual partners into the study, although 20% of the same men reported having sex with men when prompted to describe their sexual behavior. Similar to the mean score for all personal network inventories, the median score for emotional support from sexual partners was 6.89. Forty-two percent of nominated sexual partners within the dyads were described as a source of instrumental support and more than a third were described as a source of informational support. Both of these values are greater than the mean proportion of peers who were considered a source of instrumental and informational support across all personal network inventories. Only 10 % of the respondents reported that their sexual

partners were a source of appraisal support regarding discontinuation of respondent drug use, though this is twice the mean proportion calculated across all personal network inventories.

Table 6.6 Dyad characteristics and social support function variables used to model unprotected sex within sexual partner dyads (N = 229)

	n	(%)
Dyad Characteristic		
Type of sexual **p**artnership		
Not Primary	158	(69.0)
Primary	71	(31.0)
Drug partner		
No	90	(39.3)
Yes	139	(60.7)
Biological sex concordance		
Male / concordance	24	(10.5)
Female / discordant	205	(89.3)
Social Support Function		
Instrumental support		
No	132	(57.6)
Yes	97	(42.4)
Informational support		
No	142	(62.0)
Yes	87	(38.0)
Appraisal support		
No	206	(90.0)
Yes	23	(10.0)
Emotional support		
Mean (SE)	6.89	(0.154)
Median	7	
Range	1 - 10	

6.3.6 Correlates of Unprotected Sex within Sexual Partner Dyads

Unprotected sex was reported for 66% of the sexual partner dyads. Results from the univariate analyses related to unprotected sex are reported in Table 6.7. Each model was adjusted for correlated outcome data. For each sexual partner dyad, the independent roles of sexual partnership, drug partnership, and biological sex concordance on unprotected sex were examined. The first two predictor variables operated in the direction hypothesized. The likelihood of unprotected sex was significantly

higher for sexual partner dyads that were categorized as primary sexual partnerships and marginally significant for sexual partner dyads that used drugs together in the past six months. Specifically, respondents who identified sexual partners in the primary partnership category were 11.16 times as likely to report unprotected sex with them compared to sexual partner dyads that were not considered primary sexual partnerships (OR = 11.16, 95% CI: 2.22 56.05). The respondents who used drugs with their sexual partners in the past six months were 73% as likely to report unprotected sex compared to sexual partner dyads with no reported shared drug use (OR = 1.73, 95% CI: 0.91 3.31). The biological sex concordance of the sexual partner dyad was not a statistically significant predictor of unprotected sex. Next, the social support function variables were measured for each sexual partner dyad as risk factors for unprotected sex. The respondents' perceptions about their sexual partners as sources of emotional, instrumental, and informational support, in general, and appraisal support regarding discontinuation of respondent drug use operated in the directions hypothesized. Specifically, for a one-unit increase in the respondents who considered a sexual partner as a source of emotional support, respondents were 1.27 times as likely to report unprotected sex with this individual (OR = 1.27, 95% CI: 1.07 1.52). Respondents who considered sexual partners as a source of instrumental support were almost four times as likely to report unprotected sex compared to sexual partners who were not a perceived source of instrumental support (OR = 3.79, 95% CI: 1.44 9.99). Respondents were 3.49 times as likely to report unprotected sex with sexual partners who were a perceived source of informational support compared to sexual partners who were not considered a source (OR = 3.49, 95% CI: 1.55 7.89). Lastly, respondents who considered sexual partners as a source of appraisal support regarding discontinuation of respondent drug use were almost four times as likely to report unprotected sex with these individuals compared to respondents who did not consider their sexual partners a source of this kind of social support (OR = 3.87, 95% CI: 1.07 13.95).

Results from the multivariate analyses predicting condom use within sexual partner dyads are also shown in Table 6.7. The best model included all variables found to be statistically significant in the univariate analyses at $p \leq 0.10$. After adjusting for correlated outcome data and controlling for educational attainment, employment status, housing status, monthly income, and number of sexual partners in the past six months, three explanatory variables remained significant. These included type of sexual partnership, drug partnership, and appraisal support regarding discontinuation of respondent drug use. Specifically, the odds of reporting unprotected sex were more than seven times as likely among sexual partner dyads categorized as primary partnerships than for sexual partner dyads who are not considered primary sexual partnerships, given that other variables in the model were held constant (OR = 7.25, 95% CI: 2.55 20.65). The odds of reporting unprotected sex with sexual partners with whom the respondents used drugs in the past six months strengthened in the best model. Given that other variables in the model were held constant, respondents were almost three times as likely to have unprotected sex with these sexual partners compared to sexual partners with whom shared drug use is not reported in the past six months (OR = 2.93, 95% CI: 1.45 5.95). Finally, respondents who considered sexual partners a source of appraisal support regarding discontinuation of respondent drug use were almost six times as likely to report unprotected sex with these individuals compared to sexual partners who were not a perceived source of this form of social support, given that other variables in the model were held constant (OR = 5.92, 95% CI: 1.62 21.66).

Table 6.7 Unadjusted and adjusted odds ratios for unprotected sex in sexual partner dyads (N = 229)

				Full Model			Best Model		
	OR	**95% CI**	***P***	**AOR**	**95% CI**	***P***	**AOR**	**95% CI**	***p***
Intercept	--			0.1789	(0.04 0.91)	0.0378	0.08	(0.02 0.47)	0.0047
Dyad Characteristic									
Sexual partnership type									
Not Primary	Ref		--	Ref		--	Ref		--
Primary	**11.16****	(2.22 56.06)	0.003	**7.17****	(2.57 20.01)	0.000	**7.25****	(2.55 20.65)	0.000
Drug partner									
No	Ref		--	Ref		--	Ref		--
Yes	**1.73***	(0.91 3.31)	0.095	**2.85****	(1.56 5.21)	0.001	**2.93*****	(1.45 5.95)	0.003
Biological sex									
Male (concordant)	Ref		--	Ref		--			
Female (discordant)	0.80	(0.27 2.42)	0.695	0.43	(0.13 1.49)	0.185			
Social Support Function									
Emotional support	**1.27*****	(1.07 1.52)	0.008	1.04	(0.89 1.21)	0.571	1.04	(0.89 1.21)	0.636
Instrumental support									
No	Ref		--	Ref		--	Ref		--
Yes	**3.79****	(1.44 9.99)	0.007	1.60	(0.50 5.09)	0.423	1.56	(0.44 5.48)	0.489
Informational support									
No	Ref		--	Ref		--	Ref		--
Yes	**3.49*****	(1.55 7.89)	0.003	0.82	(0.23 2.93)	0.761	0.84	(0.24 2.99)	0.785
Appraisal support									
No	Ref		--	Ref		--	Ref		--
Yes	**3.87****	(1.07 13.95)	0.039	**5.57*****	(1.57 19.79)	0.008	**5.93*****	(1.62 21.66)	0.007

*p≤ 0.10, **p≤ 0.05, ***p≤ 0.01, **** p≤0.005

Control variables: respondent-level educational attainment, employment status, housing status, monthly income, and number of sexual partners in the past six months

6.4 DISCUSSION

Social, sexual and drug-using networks have a role in shaping and reproducing HIV-related norms and behavior (11, 28, 78, 98, 99). I sought to understand how structurally vulnerable, substance-using, African American men are disproportionately selling sex to men and women for drugs or money by exploring the influence of personal network composition and social support function. I also sought to understand the influence of sexual partner dyad characteristics and social support on selective risk-taking with regard to unprotected sex.

As hypothesized, the respondents' likelihood of selling sex for drugs or money was significantly higher if they had a greater proportion of peers with a history of incarceration, although this relationship was no longer significant in the multivariate model. The significance of peer incarceration on the respondents' sale of sex for drugs or money contributes to a related body of work documenting the correlation between individual and sexual partner history of incarceration and HIV-related behavior and infection (20, 67, 82, 89, 198, 199). The proportion of employed peers was protective toward the sale of sex for drugs or money, which confirmed my hypothesis. The influence of peer employment aligns with strong evidence suggesting that unemployment, low income status, history of incarceration and other forms of structural vulnerability are significant predictors of sexual risk behavior, including sexual exchange (10, 20, 21, 131, 133). Unlike previous studies, I found no association between the proportion of drug partners in the respondents' personal networks and the respondents' sale of sex for drugs or money (78, 98). Even with these null findings, the study limitations preclude me from dismissing this potential determinant of selling sex for drugs or money. This argument is especially important considering the association found between drug use and unprotected sex within the sexual partner dyads in the present study as well as strong evidence elsewhere that has shown associations between drug-using networks and sexual exchange (11, 78, 81, 98). The proportion of sexual partners in the respondents' personal networks

was not a predictor of selling sex for drugs or money. However, the personal network inventories were designed to elicit nomination of peers, in general, and not exclusively sexual partners. Therefore, underreporting of sexual partnerships is probable, which may have attenuated the relationship. As hypothesized, the likelihood of unprotected sex was significantly higher for sexual partner dyads that were categorized as primary sexual partnerships. This finding is consistent with other studies reporting that condom negotiation within closer sexual partnerships is often considered a violation of trust and may act as a disruption of intimacy (161). This result is also consistent with drug-related literature that describes increased challenges to engage in HIV protective behaviors among close intimates (116, 118, 119, 123).

There were no associations between the four forms of social support and selling sex for drugs or money. In spite of these null findings, the proportion of peers as a source of social support function within a personal network should not be rejected as a potential determinant of selling sex for drugs or money. Strong evidence showing the protective effect of social support on HIV risk behavior should be taken into account (72, 118). This is especially salient considering the dualistic influence of social support on risk behavior in the present study. Specifically, the four forms of social support were predictive of unprotected sex in the univariate dyadic analyses. However, emotional, instrumental and informational forms of social support were no longer statistically significant in the multivariate model predicting unprotected sex. Notably, the association between unprotected sex and sexual partners who were considered a source of appraisal support regarding the discontinuation of respondent drug use remained significant. This finding suggests that the respondents may be engaging in a type of serosorting, which means that participants may be identifying sexual partners with whom they engage in unprotected sex based on their sexual partners' dissuasive attitudes about drug use. As an extension, the respondents may have perceived

these sexual partners to hold similar attitudes about other risk behaviors, classified them as HIV negative and, thus, good candidates for condom-free sexual involvement.

The present study involved a small sample size, which limits statistical power and increases the likelihood of Type II error. Another limitation of the study was the unidirectional reporting of behaviors and attributes from the respondents' perspective, which is characteristic of this kind of egocentric network data and may introduce reporting bias. In single-observation network studies, it is impossible to disentangle the processes of *selection* into a network with existing normative behaviors and the membership into a network as the primary *influence* on behavior. Furthermore, the data were cross-sectional, which precludes inferences about causality and may introduce recall bias for the outcome and explanatory variables. When using this study design, confounding factors may not be equally distributed between the respondents and behavioral outcomes. Response bias is a potential threat because snowball sampling may influence how subsequent waves of respondents respond to survey items after being recruited by their peers. Sensitive sexual and drug-related behaviors were reported by respondents for themselves and others, which may also contribute to response bias. When working with structurally vulnerable study populations, there is the potential that subjects participate due to financial incentives and, thus, these individuals may have responded in a manner that ensured continued or future participation in the study. There is strong evidence that ACASI, including touch-screen ACASI (206), reduces response bias and social desirability bias due in some part to self-report (207). However, these technologies may still favor a more literate, numerate and computer-experienced study population (206, 208). This may limit the quality of the data and the relevance of the findings to the design of interventions that are more amenable to men who have greater literacy, numeracy and computer-related skills.

Specifically related to the second study aim, dyad analysis tends to assess risk behaviors within sexual, and other kinds of partnerships, which may be characterized as having strong ties

compared to partners who were not nominated into the study and may be characterized as weak ties (128, 209). However, as Valente and Vlahov assert, most risk behaviors occur within partnerships with stronger ties (124).Therefore, the present study may only be capturing a portion of the respondents' sexual partnerships that are stronger or more consistent. Additionally, other partnership characteristics beyond those selected for this study may influence condom behavior. Lastly, the sexual partner dyad characteristics were not measured from both sides of the dyad, which may impact the validity of measurement.

Researchers have been criticized for using proportions, rather than count variables, when measuring the influence of personal network composition and social support function as they may not be linear with respect to the logit. This approach was used because it was believed that proportions would be a better data generation process regarding norms formation. It was assumed that measuring the proportion of protective and risk-related compositional characteristics is a proxy for understanding the prevailing sexual exchange norms present in the respondents' personal networks. On another analytical note, snowball sampling requires statistical adjustment and there is no consensus on how to address the use of inferential statistics with non-representative samples. The analyses are also limited by measures included in the parent study. For example, the survey instrument did not contain items that explicitly measured subjective norms regarding the sale of sex for drugs or money, or condom use. Additionally, a dyad-level item for selling sex for drugs or money was unusable due to an ACASI programming error.

The influence of sexual and drug-using networks on HIV-related behavior warrants further study with a larger sample, ideally with full network data or an egocentric dataset with greater peer participation where attributes, behaviors and characteristics from peers and sexual partners can be cross-validated. Additionally, a greater understanding of the selection into networks and the

influence of networks on behavior may be answered using a longitudinal study design. Such study designs have the potential to more accurately measure how receipt, as well as provision of social support, may protect against or exacerbate risk behaviors.

While this study did not find any evidence that a greater proportion of social support within personal networks may be protective against the sale of sex for drugs or money, the results suggest that correlations between structural vulnerability and sexual risk behavior may be a function of personal networks. The disproportionate burden of incarceration experienced by the African American male respondents and their peers provides good reason for further studies that examine residential racial segregation and racial profiling by police that may shape networks and the behaviors within these networks. Few studies have addressed non-commercial sexual exchange by men. Previous literature about female sexual exchange and commercial sex work often addresses threats to personal safety and limited power that impede HIV prevention behavior, but very little is understood about men who engage in sexual exchange. For example, issues of violence victimization and restricted agency to negotiate condom use, with substance use as a back-drop, have largely gone unexplored (29)

The present study broadens our knowledge about sexual exchange and personal network composition. It also provides greater insight into selective condom use within sexual partner dyads. It moved beyond the limitations of individual behavioral research and contributes to our understanding of social arrangements and functions associated with health. The dyadic inquiry elucidated how sexual risk behavior is a product of social relationships. A dyadic analysis considers social relationships as the unit of analysis which may produce useful information about hard-to-reach populations engaging in stigmatized and/or illegal behaviors (115). Rhodes and Quirk state that “such analyses are of practical importance because risk reduction is rarely the consequence of

any one individual's decisions or actions but is influenced by negotiated actions between individuals, as well as by wider social norms and values" (104). The dyadic analysis in the present study sheds some light on how risk perceptions and behaviors are socially organized due to the significance and values that individuals place on behaviors within social interactions. This, in turn, shapes how behaviors are negotiated and whether or not they are perceived as risky (60).

The present study focused on structurally vulnerable, substance-using, African American men, including MSM and MSMW, who have historically been under-reached by culturally responsive, network- and peer-based interventions designed to prevent and control transmission of HIV and other STI by addressing sexual exchange and providing a more nuanced set of strategies for promoting consistent condom use. The study's approach to examining social support is intended to inform lay health interventions that may be tailored to meet basic human needs including social contact, a sense of belonging, approval, care, and safety (34). The nonrandom nature of networks is what makes them inherently social (32) and, therefore, suitable for skills- and norms-based interventions that develop new and bolster existing health-promoting network ties, harness resiliency, facilitate multi-faceted social support through lay health advising, and strengthen health-promoting dynamics within social networks through community-based participatory action (33-35).

CHAPTER 7: CONCLUSION

7.1 SUMMARY OF FINDINGS

This set of analyses sought to qualitatively examine how social conditions shape sexual norms and risk behaviors of structurally vulnerable, African American, male substance-users who report high-risk sexual behaviors with men and women. Two specific sexual risk behaviors were then studied. The association between personal network composition and social support function on the sale of sex for drugs or money was tested among a similar set of men. Then the association between sexual partner dyad characteristics and social support function on unprotected sex was tested.

The findings from this study, and the process of mixing methods at several stages of research, contribute to the expanding use of mixed methods in public health research. The study elucidates how a greater understanding of the social conditions experienced by the men who participated in the in-depth interviews supports the hypothesized relationships that examined the predictors of sexual exchange and condom use among a similar set of men who completed the network-based surveys. The first study aim advances the knowledge base on how social conditions shape sexual norms and risk behavior among men about whom little is known and who have received little systematic public health attention. It addresses gaps in the literature which may inform sexual risk reduction interventions that are socially and culturally relevant to men similar to those who participated in both parent studies. The results may also provide insights that guide the development of policies that are context sensitive. The second and third study aims contribute to the growing body of evidence that demonstrates how social networks assert their influence on

health behavior which may inform peer- and network-based interventions tailored for African American male substance-users. Such implications are explored in depth later in this chapter.

The chapter continues with a brief discussion of the significance and process of mixing methods for this study. I then provide an interpretation of the emergent themes from the first study aim as they relate to a framework called the Continuum of Violence. This section is followed by an integrated summary of the findings for all three study aims with the intention of producing a comprehensive "end product that is more than the sum of the individual quantitative and qualitative parts" (148). Illustrative quotes from the first study aim provide further insights into the explanation of the quantitative findings. The integration of the qualitative and quantitative findings takes on a more summative, rather interpretive form. I refer to the men who participated in the network-based survey study as 'respondents' and the men who participated in the in-depth interviews as 'participants.' I end this chapter by addressing the methodological limitations, and discussing the implications for further research, practice and policy.

Mixing qualitative and network-based data was appropriate for answering the guiding research questions for Aim 1 and testing hypotheses for Aim 2 and Aim 3 because network-based inquiry maps social processes that drive individual behavior, and qualitative inquiry is equipped to answer the 'how' and 'why' of social processes. This mixed methods study answered a complex set of research questions by mixing methods at three of the four stages of research. Though the present study was a secondary analysis, the guiding questions for the first study aim and research questions and hypotheses for Aim 2 and Aim 3 were complementary and of my own conceptualization. At the data analysis stage, I integrated the study by conducting concurrent analyses. For example, the quantitative data analyses for Aim 2 and Aim 3 were considered throughout the qualitative code development and memo writing completed for the first study aim. Though I wrote two separate manuscripts for this dissertation, including one for qualitative first

study aim, and another for the second and third quantitative study aims, I also interpret the findings from all three study aims in an integrated manner later in this chapter.

7.1.1 Interpretation of Emergent Themes from Aim 1

The structurally vulnerable, African American, MSMW who participated in the qualitative parent study reside in social environments that are not supportive of HIV/STI prevention behaviors. Among the men in the study who were attracted to other men, there appeared to be little space for them to be themselves. Among the men who did not appear to be sexually attracted toward other men, yet engaged in sexual exchange for drugs or money, there appeared to be limited opportunities to meet their basic needs that did not necessitate the commodification of their bodies. Furthermore, a greater understanding of the social conditions that shape the incongruences between sexual identity, attraction and behavior were made clearer by the men's narratives. However, rather than focusing on reconciling sexual incongruences, there is a more urgent need to understand and address the persistent influence of violence on masculine identity that appears to be negatively impacting these men's sexual health.

With regard to the social conditions that shape the intersecting sexual and substance-using norms and behaviors that place structurally vulnerable men at risk for HIV and other STI, the qualitative study found that their exposure to violence, ranging from personal addiction, assault, and incarceration to institutional racism and homophobia, shaped their sexual behaviors. The narratives of historical and present-day violence described by the men suggest that these experiences take on dynamic and dramatic meaning in their lives and that sexual risk behavior is a reasonable response to such micro and macro forces over time. The political, structural, symbolic and everyday violence experienced by the male participants have stripped them of their most basic role as integrated members of society. In an effort to reach their masculine ideal, these men

engage in sexual risk behavior to negotiate social status and power despite the cost of undermining their health. These findings are consistent with Whitehead's description of men's cultivation of respect and reputation through sexual prowess when economic capacity and sociopolitical power are scarce. As social actors, the men's sexual risk behavior is reflective of the social marginalization that defines their lives and what Whitehead refers to as "fragmented masculinity" (152).

The men's sexual risk behaviors with other men were nearly always discussed in a manner to suggest that these behaviors are necessary coping strategies exercised by men living on the margins of society. Consistent with Harawa and colleagues' work establishing the role of substance use as motivation and justification for sexual behavior with men (63), the use of substances by the men in this qualitative parent study was described as an outgrowth of, and often a necessary part of, their sexual experiences and partnerships with men. However, these maladaptive coping strategies do not support the formulation of risk reduction strategies, including condom use, serosorting and strategic positioning that could ease the disproportionate HIV and other STI burden faced by high-risk, African American, substance-using MSMW.

7.1.2 Integrated Summary of Findings for Aims 1, 2 and 3

The mixed methods study broadens our knowledge about sexual exchange and personal network composition and social support function. The study also provides greater insight into selective condom use within sexual partner dyads. Although, such clarity arrives principally from the third study aim, as narratives about condom use were surprisingly scarce in the qualitative data. The study moved beyond the limitations of individual behavioral research and contributes to our understanding of sexual norms and risk behaviors in relationship to social arrangements and functions.

As hypothesized, the quantitative study Aim 2 respondents' likelihood of selling sex for drugs or money was significantly higher if they had a greater proportion of peers with a history of incarceration, although this relationship was no longer significant in the multivariate model. The significance of peer incarceration on the respondents' sale of sex for drugs or money contributes to a related body of work documenting the correlation between individual and sexual partner history of incarceration and HIV-related behavior and infection (20, 67, 82, 89, 198, 199). The proportion of employed peers was protective toward the sale of sex for drugs or money, which confirmed my hypothesis. The influence of peer employment aligns with strong evidence suggesting that unemployment, low income status, history of incarceration and other forms of structural vulnerability are significant predictors of sexual risk behavior, including sexual exchange (10, 20, 21, 131, 133). The vast majority of the participants from qualitative parent study described their sexual risk behavior with men as a means of meeting their substance use needs. A subset of the men also described having sex with men for money to purchase clothing and shoes in order to participate in an image-based consumer society while they struggled to secure steady employment and housing. Gregory, for example, is a 37-year-old, bisexual-identified man who is unemployed, has an undisclosed HIV status, a high school education and a history of homelessness, substance abuse treatment, and incarceration. He described selling sex to men in order to meet women as potential sexual partners and companions.

> *I like to look good….and to look good I do what I do…So I got to do what I got to do to buy what I want to buy, to make me look how I want to look... Well, you got a woman that looks at a man like "Damn, you can't do a damn thing. You can't take me out. You can't do this or that." You know? If I didn't do those things [sexual exchange with men] then I would not be about to do those things for her so one benefits the other. You know what I'm saying? And that's basically how I keep the thing rolling… I really dig this female. It's not all about sex…I like to show my generosity and show that you know that I have, you know, I have a little bit of respect and I have some decency in myself to say "Ok, let's go out to a movie or I'll treat you to lunch one day."*

Gregory's description of selling sex for money exemplifies a common sexual risk behavior described by a majority of the men and, in particular, the men with a history of homelessness, substance abuse treatment, and incarceration.

Unlike previous quantitative studies, I found no association between the proportion of drug partners in the respondents' personal networks and their sale of sex for drugs or money (78, 98). Even with these null findings, the study limitations preclude me from dismissing this potential determinant of selling sex for drugs or money. This argument is especially important considering the association found between drug use and unprotected sex within the sexual partner dyads in the present study as well as strong evidence elsewhere that has shown associations between drug-using networks and sexual exchange (11, 78, 81, 98). To further support this argument, Frederick's words exemplify his normalization of sexual risk behavior and his identification with the sexual exchange norms of his substance-using reference group.

> *I think I was locked up in penitentiary then, that's when I first tried somethin' crazy like that [having sex with a man], just to see if I would like it. 'Cause guys was doin' it and stuff, but I didn't really like it, you know what I mean? So I stopped doing it. Then, when I got outside prison, and got on drugs and stuff, it made it a little easier. So I would tell myself it would be okay…. the drugs made it easier. I don't know, seemed like when I was in prison and I tried havin' that I couldn't do that. I just couldn't do that. Then when I got out and I got to runnin' around, I met so many people that do this, you know what I mean? So many men, like men here. So many that do it and talk about it. "Man just get that money. Just don't think about it. Go on about your business." So that made it a little easier now.*

Frederick's remarks capture many of the men's normalization of their sexual exchange and substance use, which may hinder them from reflecting on their risk behaviors and formulating risk reduction strategies. The desperation surrounding a majority of the men's substance use also appeared normalized in their accounts of how substances often played a central role in organizing their daily lives. Such normalization and familiarity with these risk behaviors could lessen the men's perceptions that these behaviors may be harmful to their health. Calvin provided insight into his

willingness to discuss how he sells sex to men with a confidante who has also struggled with serious substance addiction.

> *People that talk about eating out of garbage cans 'cause they homeless, out there doing whatever they got to do, they understand. They understand how you can get into that type of [same-sex sexual exchange] relationship. Those are the people you choose, that you can talk to about it…'cause when you tell them about your having a homosexual relationship, they kind of know what you're going through. They tell you their own story and that it was the quickest way, you know, to make money. And that's what your entire story depends on, a quick way to make money.*

The proportion of sexual partners in the respondents' personal networks was not a predictor of selling sex for drugs or money. However, the personal network inventories were designed to elicit nomination of peers, in general, and not exclusively sexual partners. Therefore, underreporting of sexual partnerships is probable, which may have attenuated the relationship. As hypothesized, the likelihood of unprotected sex was significantly higher for sexual partner dyads that were categorized as primary sexual partnerships. This finding is consistent with other studies reporting that condom negotiation within closer sexual partnerships is often considered a violation of trust and may act as a disruption of intimacy (161). This result is also consistent with drug-related literature that describes increased challenges to engage in HIV protective behaviors among close intimates (116, 118, 119, 123). Many of the men from the qualitative parent study described the desire to be discreet about different sexual partners who were assisting them in meeting distinct needs. The following example from Gregory represents a subset of the men who reflected on the potential consequences of their sexual risk behaviors with multiple partners.

> *I don't work, don't have money. There are those necessities that I need. So basically, I have a male friend that you know, I engage in sex with him. And he, you know, gives me money in return, that way. That's just how I keep myself in clothes, shoes, things of that nature. And I would hate for her to find out that I actually, you know, engage with other men. Because, you know, I don't think she goes for that.*

Gregory expressed a related sentiment about his desire to appear sexually exclusive and present different sexual identities with his female and male sexual partners. This may, in turn, influence his respective partners' condom use and other sexual risk reduction strategies.

> *To her, I'm straight. I'm all about a woman. To them, I'm all about a man (laughs). If I told one about the other, then I'd lose that one. Because they think all they got is me, even though they might have others. But when it comes to me, they think all they got is me, you know? And I keep it that way.*

There were no associations between the four forms of social support and selling sex for drugs or money. In spite of these null findings, the proportion of peers as a source of social support within a personal network should not be rejected as a potential determinant of selling sex for drugs or money. Strong evidence showing the protective effect of social support on HIV risk behavior should be taken into account (72, 118). A majority of the men participating in the qualitative parent study remarked on the relationships they formed in prison that contrasted with their isolated lives after reentry in communities. Anthony, a 52-year- old, bisexual-identified, HIV-negative man with some college education who works part-time as a clerical worker, described his experiences in prison and the impact of the prison industrial complex on the lived experiences of African American men.

> *It is really a tool that society uses to castrate black men, to control black men. Keep 'em where they are, because they are feared, feared where they want to be. They say they are feared because they are angry and whatnot, but they're not. They are just made out to, made out to be angry, to be harmful… [In prison] I met some of the best people in my life, know what I'm saying? Some of the best people, and we both saw the best in each other.*

Many of the men in the qualitative parent study reflected on the lack of social integration after prison release. Calvin is a 45- year-old, straight-identified, HIV-negative man with some college education who works as a brick mason and has a history of homelessness, substance abuse

treatment, and incarceration. He spoke of how the lack of social integration leads many men to return to substance use, sexual risk behavior with men, and criminal behavior.

> *I'm from the South, it's [the culture] hush-hush, take to the grave with it. And thus, you continue to use [substances], continue to do this [same-sex sexual risk] behavior. Continue to rob banks 'cause they ain't had nobody to talk to. It's crazy. There are people that rob and kill because won't nobody sit there and talk to them. And I've been in the penitentiary and talked to people, and when they in the penitentiary, they so educational. They sit down and talk to you. You would never think that he was a murderer. But when they get out, the world shuns them so bad. It pushes them in a corner, don't talk to 'em, don't communicate with 'em, don't give 'em no opportunities. So they say "Let me go back right to what I know."*

Calvin's remarks encapsulate the shared perception among the men that individuals with a history of incarceration occupy a lower social status and receive the least amount of social support. In addition, his words reflected his observations on intersecting stigma associated with race/ethnicity, sexual behavior, and substance use.

The dualistic influence of social support on risk behavior is evident across the three study aims. This is further underscored by the role of social support in predicting unprotected sex in the univariate dyadic analyses for the third study aim. However, emotional, instrumental and informational forms of social support were no longer statistically significant in the multivariate model predicting unprotected sex. Notably, the association between unprotected sex and sexual partners who were considered a source of appraisal support regarding the discontinuation of respondent drug use remained significant. This finding suggests that the respondents may be engaging in a type of serosorting, which means that respondents may be identifying sexual partners with whom they engage in unprotected sex based on their sexual partners' dissuasive attitudes about drug use. As an extension, the respondents may have perceived these sexual partners to hold similar attitudes about other risk behaviors, classified them as HIV negative and, thus, good candidates for condom-free sexual involvement.

7.2 STUDY LIMITATIONS

7.2.1 Limitations of Aim 1

It is possible that emergent themes, which were interpreted using the Continuum of Violence framework in more depth in Chapter 5 (Manuscript 1), did not meet saturation due to the relatively small sample size and the large number of domains of inquiry contained in the interview guide (201). This is to say, that with a larger sample size, the themes may have been made more clear. Additionally, it is possible that there was no study participation among certain types of men such as MSMW who experience discomfort discussing their sexual behavior with men or who did not disclose their sexual risk behaviors at the time of screening. If this is the case, this may limit the relevance of the findings to the design of interventions that are only amenable to men who are willing to discuss their sexual risk behaviors with men. Lastly, the present study utilized purposive sampling. Therefore findings cannot be generalized to all structurally vulnerable, African American, substance-using MSMW, though they may provide insights for the direction of further research and practice in different settings and different configuration of risk behaviors

7.2.2 Limitations of Aims 2 and 3

The egocentric and dyadic study involved a small sample size, which limits statistical power and increases the likelihood of Type II error. Another limitation of the study was the unidirectional reporting of behaviors and attributes from the respondents' perspective, which is characteristic of this kind of egocentric network data and may introduce reporting bias. In single-observation network studies, it is impossible to disentangle the processes of *selection* into a network with existing normative behaviors and the membership into a network as the primary *influence* on behavior. Furthermore, the data were cross-sectional, which precludes inferences about causality and may introduce recall bias for the outcome and explanatory variables. As a result of this cross-

sectional study design, confounding factors may not be equally distributed between the respondents and behavioral outcomes. Response bias is a potential threat because snowball sampling may influence how subsequent waves of respondents respond to survey items after being recruited by their peers. Sensitive sexual and drug-related behaviors were reported by respondents for themselves and others, which may also contribute to response bias. When working with structurally vulnerable study populations, there is the potential that subjects participate due to financial incentives and, thus, these individuals may have responded in a manner that ensured continued or future participation in the study. There is strong evidence that ACASI, including touch-screen ACASI (206), reduces response bias and social desirability bias due in some part to self-report (207). However, these technologies may still favor a more literate, numerate and computer-experienced study population (206, 208). This may limit the quality of the data and the relevance of the findings to the design of interventions that are more amenable to men who have greater literacy, numeracy and computer-related skills.

Researchers have been criticized for using proportions, rather than count variables, when measuring the influence of personal network composition and social support function as they may not be linear with respect to the logit. This approach was used because it was believed that proportions would be the best way to measure prevailing norms within particular social networks. It was assumed that measuring the proportion of protective and risk-related compositional characteristics is a proxy for understanding the prevailing sexual exchange norms present in the respondents' personal networks. On another analytical note, snowball sampling requires statistical adjustment and there is no consensus on how to address the use of inferential statistics with non-representative samples. The analyses are also limited by measures included in the parent study. For example, the survey instrument did not contain items that explicitly measured subjective norms

regarding the sale of sex for drugs or money, or condom use. Additionally, a dyad-level item for selling sex for drugs or money was unusable due to an ACASI programming error.

7.2.3 Limitations Specific to Aim 3

Dyad analysis tends to assess risk behaviors within sexual, and other kinds of partnerships, which may be characterized as having strong ties compared to partners who were not nominated into the study and may be characterized as weak ties (128, 209). However, as Valente and Vlahov assert, most risk behaviors occur within partnerships with stronger ties (124).Therefore, the present study may only be capturing a portion of the respondents' sexual partnerships that are stronger or more consistent. Additionally, other partnership characteristics beyond those selected for this study may influence condom behavior. Lastly, the sexual partner dyad characteristics were not measured from both sides of the dyad, which may impact the validity of measurement

7.4 Implications for Further Research

7.4.1 Implications for Further Research Informed by Aim 1

Study Aim 1 intended to make the social worlds of African American, substance-using MSMW increasingly visible for public health promotion and disease prevention efforts. Their social vulnerability exposes them to multiple forms of violence that may shape the men's identities as substance users, low-income individuals, and as African American men rather than as a gay or bisexual. A greater use of the Continuum of Violence framework to understand the impact of violence on sexual and other types of risk behavior is warranted. The role of masculine identity construction in sexual health behavior deserves further inquiry, especially as it pertains to how the men's performance and evaluation of their social roles may shape their risk behaviors. These findings suggest that there may be an important shift away from understating how men may

reconcile their sexual identity, behavior and attraction toward men an move toward understanding the intersection of masculine identity construction and sexual risk behavior

This study also revealed how current HIV prevention-related research can inadvertently reinforce biases based on race/ethnicity, class and sexuality. By focusing on intrapersonal and interpersonal forms of violence, including substance abuse, non-disclosure of high risk behaviors to sexual partners and falsification of sexual exclusivity, the men in the present study may be reinforcing negative stereotypes about African American male sexuality. As a consequence, the HIV epidemic is often interpreted as produced by 'dishonest' men rather than examining and intervening upon broader social conditions. David Malebranche aptly frames this polemic when he states that "often the discussion begins with the high rates of HIV/AIDS among heterosexual black women, in which bisexual Black men are viewed as unidirectional predators and 'vectors of transmission' of HIV from the homosexual community to an unsuspecting heterosexual female community. While this pejorative generalization of bisexual behavior among black men is common, the positive and affirming aspects of bisexual behavior and identification, and the extent of their role in this HIV epidemic deserves a much deeper exploration than is currently available" (24) .

7.4.2 Implications for Further Research Informed by Aims 2 and 3

While the second study did not find any evidence that a greater proportion of social support within personal networks may be protective against the sale of sex for drugs or money, the results suggest that correlations between structural vulnerability and sexual risk behavior may be a function of personal networks. Additionally, the disproportionate burden of incarceration experienced by the African American male respondents and their peers provides good reason for further studies that examine residential racial segregation and racial profiling by police that may shape networks and the behaviors within these networks. Few studies have addressed non-commercial sexual exchange by

men. Previous literature about female sexual exchange and commercial sex work often addresses threats to personal safety and limited power that impede HIV prevention behavior, but very little is understood about men who engage in sexual exchange among men. For example, issues of violence victimization and restricted agency to negotiate condom use, with substance use as a back-drop, have largely gone unexplored among men (29)

The dyadic inquiry elucidated how sexual risk behavior is a product of social relationships. A dyadic analysis considers social relationships as the unit of analysis which may produce useful information about hard-to-reach populations engaging in stigmatized and/or illegal behaviors (115). Rhodes and Quirk state that "such analyses are of practical importance because risk reduction is rarely the consequence of any one individual's decisions or actions but is influenced by negotiated actions between individuals, as well as by wider social norms and values" (104). The dyadic analysis in the present study sheds some light on how risk perceptions and behaviors are socially organized due to the significance and values that individuals place on behaviors within social interactions. This, in turn, shapes how behaviors are negotiated and whether or not they are perceived as risky (60). Further research should explore other aspects of selective risk-taking.

7.5 Practice Implications

As Rhodes and colleagues aptly state, "If HIV risk is socially produced then so too are public health solutions" (60). The finding from these three analyses shed additional light on how social environments produce disproportionate HIV burden among African American men, and thus may elucidate what health-promoting *productions* are possible. Blankenship et al. describe ecologically-oriented structural interventions "that work by altering the context within which health is produced and reproduced" (210).

The study's findings call attention to the need to explore and foment peer- and network-based opportunities where African American substance-using men are able to create their own risk reduction strategies that preserve and enhance their masculinity, create a space for positive exploration of their sexuality and enhance their positive roles in society. Such interventions should take place within the criminal justice system, vocational training programs, substance treatment centers, homeless shelters, and other places where African American, substance-using men are disproportionately represented. Unfortunately, most funded options to combat HIV/AIDS in the US are limited to cognitive behavioral interventions and a smattering of social marketing campaigns. Case-management for former inmates, in addition to required probation and parole relationships, are rarely funded and often are unable to offer long-term support (97). Interventions that aim to prevent primary and secondary HIV transmission and reduce recidivism are well matched to skills- and norms-based interventions that develop new and bolster existing health-promoting network ties, facilitate multi-faceted social support through LHA, and strengthen health-promoting dynamics within social networks through community-based participatory action (33-35).

This begs the question: how do we move beyond short-term individual and group-level interventions that are ill-equipped to combat the multiple forms of violence experienced by structurally vulnerable African American men? Unfortunately, many of the outcome objectives among the contemporary evidence-based interventions fail, as they are designed to arm individuals with the tools to transcend their everyday life contexts through short-term intervention without changing the social and economic environment.

Witnessing such challenges in the current HIV prevention landscape, and in light of the present study, make it more urgent to move beyond cursory notions of cultural and technical competence and delve deeper to a paradigm that reflects intercultural responsiveness and lasting

capacity-building into the hands of people at greatest risk for HIV and most affected by incarceration. Further description of how to synchronize individual, group, and community-level interventions that are paired with policy changes aimed at preventing disease and vitalizing/revitalizing impoverished communities is beyond the scope of this dissertation. Regardless of this disclaimer, all forms of intervention should include participatory processes where academic players question research agendas and its conduct, commit to unconventional and accessible dissemination of findings, and design materials and curricula that are deemed valuable by structurally vulnerable communities under study.

7.6 Policy Implications

Structurally vulnerable individuals occupy social positions that are historically and disproportionately burdened by economic exploitation and multiple forms of discrimination (6). Furthermore, self-determination toward health and social well-being is often limited by the power to decide, the power to act, and the control of resources (190) . Interventions that foster network-level change operate from the assumption that behavioral change will occur through a diffusion of health-promoting norms within a particular social environment. What is needed are policies that address structural factors, such as employment, educational and vocational training opportunities, alternative sentencing that does not require incarceration, and access to safe housing and health care that strengthen sustained health-promoting behaviors and revitalize communities (60). Structural-level approaches to addressing HIV may also address the fundamental sources of other health inequities. Finally, public health professionals can begin by enacting policies that facilitating the hiring and training of structurally vulnerable men as LHA and other community agents of change (211).

APPENDIX A: SAMS SEMI-STRUCTURED INTERVIEW GUIDE

Section 1. **Current Main Sex Partner(s)**

1) Are you currently in a sexual relationship? Without giving me his or her name or any identifying information, tell me about your current main sexual partner and what your relationship is like with this partner?
   Probe for:

   - *Characteristics of partner (e.g., gender, age, race etc.)*
   - *Description of relationship (e.g., How long have you been together? How did you meet? How close are you? How much time do you spend together? Etc.)*
   - *Context of sex with each partner*
   - *Sexual practices with each partner*
   - *Disclosure/Knowledge of each other's other partners & bisexuality*

Section 2. **Current Non-Main Sex Partner(s)**

2) Tell me about any (other) sexual partners that you currently have.
   Probe for:

   - *Characteristics of partner(s) (e.g., gender, age, race etc.)*
   - *Description of relationship(s) (e.g., How long have you been together? How close are you? How much time do you spend together? Etc.)*
   - *Context of sex with each partner*
   - *Sexual practices with each partner*
   - *Disclosure/Knowledge of each other's other partners & bisexuality*

Section 3. **Sexual Identity**

3) How do you personally identify yourself sexually?
   Probe for:

   - *How comfortable are you with this identity?*
   - *Do you identify yourself differently to different people?*
   - *Does what other's think affect your expression of your own sexuality?*
   - *Do you find yourself trying to keep your sexual orientation or behaviors hidden from some people? If so, what do you do?*

4) Tell me about the last time you were hanging out with your friends and you all started talking about sex. What did you talk about?
   Probe for:

   - *What did you say?*
   - *What did they say?*

5) How accepting do you think people in your neighborhood are of men who identify as gay, or bisexual?
Probe for:

- *How do you know this?*
- *Do you think that some types of people are more accepting of same-sex sex than others? If so, which type of people are most accepting? Which are least accepting? What factors do you think influence this level of acceptance? (e.g., age, race, social class, religion, etc.)*

Section 4. **First Sexual Experience with a Woman**

6) Without giving me the name of this individual, tell me about the first time you had sex with a woman and how this first sexual experience took place?
Probe for:

- *Characteristics of partner (e.g., age, race, relationship etc.)*
- *Context or characteristics of the situation and the relationship (e.g., consensual vs. forced, types of sex, setting etc.)*
- *Reaction to experience*

Section 5. **First Sexual Experience with a Man**

7) Without giving me the name of this individual, tell me about the first time you had sex with a man and how this first sexual experience took place?
Probe for:

- *Characteristics of partner (e.g., age, race etc.)*
- *Context or characteristics of the situation and the relationship (e.g., consensual vs. forced, types of sex, setting etc.)*
- *Reaction to experience*

Section 6. **Sexual Preference**

8) Tell me about what is different for you about sexual relationships with women and sexual relationships with men?
Probe for:

- *What do you like about each? Don't like?*
- *Which would say you prefer and why?*
- *How did you come to this realization?*
- *Do you act or feel differently with male partners than with female?*

Section 7. **Current Drug Use and Risk Behaviors**

9) Do you currently use any drugs regularly or recreationally? [If yes] Tell me about your drug use during the last month.
Probe for:

- *Drugs used and frequencies of use*
- *Situations surrounding use of different drugs*
- *Characteristics of people used with*
- *Role/relationship between drugs and sex*

10) Can you describe to me what happened the last time you had any type of sex while using any kind of drugs? Without giving me any names of individuals, tell me the whole story from start to finish.
Probe for:

- *Context (who and where)*
- *Drugs involved and who used them*
- *Description of sexual activity*
- *Comparison of sexual activity with drugs to sex without drugs – reduction of inhibitions, enhancement of performance etc.*

Section 8. **Sexual Exchange**

11) Have you ever paid anyone in money or drugs for sex? Tell me about it.
Probe for:

- *Gender & other characteristics of the sex partner(s)*
- *Description of what was traded (money, drugs) and was received (types of sex involved)*
- *Circumstances & motivations*
- *Ongoing or onetime behavior*

12) Have you ever given anyone sex in order to obtain money or drugs? Tell me about it.
Probe for:
- *Gender & other characteristics of the sex partner(s)*
- *Description of what was traded (money, drugs) and was received (types of sex involved)*
- *Circumstances & motivations*
- *Ongoing or onetime behavior*

13) How common do you think it is for drug dealers around here to accept sex as payment for drugs? [If common] under what circumstances do drug dealers around here accept sex as payment for drugs?
Probe for:

- *Characteristics of dealer and person exchanging*
- *Drugs involved*
- *Sex acts involved*

Section 9. **Coercive Sex**

14) Have you ever been in a situation where you felt (pressure to have sex when you didn't want to) forced to have sex against your will? If so, can you tell me about that experience?
Probe for:

- *Onetime or recurring event*
- *Age at the time of the event*
- *Relationship to perpetrator*
- *Sex acts involved*

Section 10. **Incarceration History**

15) Have you ever been arrested for anything? [If no, skip to next section.]

16) [If yes] Have you ever been to jail and if so what was the longest time you ever spent in jail?

17) [If yes] Have you ever been to prison and if so what was the longest time you ever spent in prison? [If longest time less than a month then skip to closing.]

18) Did you have a wife/girlfriend/boyfriend/partner before you went to jail/prison? If so, tell me about what happened to that relationship when you went to jail/prison.
Probe for:

- *Description of pre-incarceration relationship and length of sentence*
- *Partners sexual behavior during period*
- *Status of relationship post release*
- *Did you ever have sex while in jail/prison? What were the circumstances? Probe for:*
  i) Characteristics of partners (e.g. gender, age, race etc.)
  ii) Description of situations and motivations

19) Did you know other men who had sex in jail/prison? What were the circumstances of that (e.g., sex for money, drugs, other goods, forced)?
Probe for:

- *How did the people who were having sex in prison think of themselves in terms of being heterosexual, bisexual, or something else?*
- *Initiation and continuation of same sex behavior*

20) Tell me about your sexual behavior when you were just released.
Probe for:

- *Description of first sexual encounter and partner after release*
- *Description of subsequent sexual encounters and partners*

Section 11. **MSMW Connections & Recruitment**

21) How many of your male friends do you think have sex with both men and women? How do you know this?

22) Do you think any of your male sexual partners or friends would be willing to participate in this study?
Probe for:

- *Why?*
- *Why not?*

23) If we were to conduct a larger study of sexually-active men who have sex with both men and women, where would you suggest would be good places to recruit men from (i.e., good places to advertise for the study)?

24) If we were to conduct a larger study of sexually-active men who have sex with both men and women, what factors would influences men's decision whether or not to participate?
Probe for:

- *Confidentiality*
- *Time & Convenience*
- *Amount of Payment*

Closing

25) Is there anything that we have not talked about that you think would be helpful to share with me?

End

Thank you for sharing your time with me today.

APPENDIX B: SAMS DEMOGRAPHIC & SEXUAL RISK BEHAVIOR SURVEY

Script: "I am going to start off with a few questions that will tell us a little bit about you and your background."

	Open-Ended Response	NO	YES
1. How old are you?			
2. How do you identify yourself racially? [from observation if possible]			
3. What is the highest level of education you have completed?			
4. Are you currently employed?			
5. What kind of work do you do?			
6. Do you consider yourself religious?			
7. If so, what religion do you belong to?			
8. Where do you currently live?			
9. How long have you lived there?			
10. If moved within the past 5 years, where did you move from?			
11. Have you ever been homeless?			
12. Do you live with family or have family in the area?			
13. Have you ever been in substance abuse treatment?			
14. Have you ever been tested for HIV?			
15. Do you know what your HIV status is?			
16. Do you have a regular doctor or a health care provider?			
17. How many male sexual partners have you had in the past 30 days?			
18. How many female sexual partners have you had in the past 30 days?			
19. How many male and female sexual partners in total have you had in the past 30 days?			

APPENDIX C: SATH-CAP NETWORK STUDY NON-REPEATING SURVEY INSTRUMENT

Calculated Variable
TODAY = Today's date

Q1. Client ID

Q2. Is this a network seed?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A1. Are you already enrolled in the RURAL/URBAN Health Study, (THAT IS, have you already completed a main study survey for this study?)
0 = No
1 = Yes
9 = Not Applicable

A1A. What's the main study ID?
0-9996 = range
9997=Don't Know
9998= Refuse to Answer
9999 = Not Applicable

A1B. Where did you complete the main survey?
1 = Raleigh
2 = Durham
3 = Smithfield
4 = Siler City

A2. Are you male?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A3. What city or town do you live in?
1 = Chapel Hill
2 = Durham
3 = Garner
4 = Hillsboro
5 = Raleigh
7 = Selma
8 = Siler City
9 = Smithfield

10 = Wendell
99 = Not Applicable

A4. What is you date of birth?
1/1/1900 – Current = mm/dd/yyyy
2098 = Refuse to Answer Year)
A5. Are you biologically?

A5. Are you biologically:
1=Male
2=Female
7=Don't Know
8=Refuse to Answer
9=Not Applicable

A6. What is your race/ethnicity?

1= White non-Hispanic
2 = African American non-Hispanic
3 = Latino
4 = Mixed (African American & Latino)
5 = Native American
6 = Mixed – Other
7 = Don't Know
8 = Refuse to Answer
9 = Not Applicable

A7. What residence do you currently live in?
1 = Apartment, condo or our you rent or own, or student dormitories
2 = A family member's apartment or house
3 = A lover's (boyfriend's, girlfriend's, or partner's) apartment or house
4 = A friend's (not a lover's) apartment or house
5 = A rented room in a hotel or rooming house
6 = A shelter, boarding house, or halfway house
7 = A squat, or an abandoned building, on the street (e.g. outside, vehicle, train station, etc.)
8 = Other
98 = Refuse to Answer
99 = Not Applicable

A8. What is the highest level of education you have completed?
1 = No formal schooling
2 = Elementary school but not finished high school
3 = High school graduate (or GED)
4 = Currently in college
5 = Graduated from 4 year college or university
6 = Pursuing or completing a graduate or professional degree
8 = Refuse to Answer
9 = Not Applicable

A9. What is your current marital or partnership status?
1 = Singe (never married)
2 = Legally married or legal domestic partner
3 = Partnered or informally married, living together
4 = Separated
5 = Divorced
6 = Widowed
7 = Other
8 = Refuse to answer

A10. Which of the following best describes your current work situation?
1 = Disabled, not able to work
2 – Unemployed
3 = Working full-time, 35 hours or more a week
4 = Working part-time, less than 35 hours a week, could include labor pool or day work
5 = A full time stay-at-home parent
6 = Full time student
7 = Retired
8 = Refuse to Answer
9 = Not Applicable

A11. How much money did you earn or receive from a job or other legal sources in the past month?
1 = $0-500
2 = $501-1000
3 = $1001-1500
4 = $1501 – 2000
5 = $2001 – 2500
6 = $2501 – 3000
7 = $3001 – 4000
8 = $4001 – 5000
9 = $5001 or more
97 = Don't know
98 = Refuse to answer

A12. How many times before today have you had a test for HIV?
0-96 = range
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

A13. Have you ever been told by a health care provider or counselor that you have HIV/AIDS?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

A14. In what year were you first told you had HIV?
Unlimited – Unlimited = yyyy
2097 + Don't Know (Year)
2098 = refuse to Answer (Year)
2099 = Not Applicable (Year)

A15. Have you ever used marijuana (e.g., weed, grass, reefer)?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A16. How many days did you use marijuana (e.g., weed, grass, reefer) in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A17. Have you ever used amphetamines/methamphetamine (e.g. crystal, meth, tina)?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A18. How many days did you use amphetamines/methamphetamine (e.g. crystal, meth, tina) in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A19. Have you ever used heroin and cocaine mixed together (or speedball)?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A20. How many days did you use heroin and cocaine mixed together (or speedball) in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A21. Have you ever used crack (e.g. smokable cocaine, rock)?
0 = No
1 = yes
7 = Don't Know

8=Refuse to Answer
9 = Not Applicable

A22. How many days did you use crack (e.g. smokable cocaine, rock) in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A23. Have you ever used powder cocaine (or coke)?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A24. How many days did you use powder cocaine (or coke) by itself (other than crack) that you injected or snorted in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A25. Have you ever used heroin by itself?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A26. How many days did you use heroin by itself in the past 30 days?
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A27. Have you ever used opiates that you didn't have a prescription for (e.g. Vicodin, Percocet, Demerol, Oxycontin, non-prescription methadone, etc.)?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A28. How many days did you use other opiates (e.g. Vicodin, Percocet, Demerol, Oxycontin, non-prescription methadone, etc.) in the past 30 days
0-30 = range
98 = Refuse to Answer
99 = Not Applicable

A29. Have you ever injected any drugs?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

A30. Please check all that apply. What drugs have you ever injected in your lifetime?
A30A: Amphetamines/Methamphetamines
A30B: Heroin and cocaine mixed together (or speedball)
A30C: Crack (e.g. smokable cocaine, rock)
A30D: Powder cocaine (or coke)
A30E: Heroin by itself
A30F: Opiates you didn't have a prescription for
A30G: Hormones or steroids
A30H: Some other drugs
A30I: None of the above

A31. Please check all that apply. In the past 6 months which drugs have you ever injected?
A31A: Amphetamines/Methamphetamines
A31B: Heroin and cocaine mixed together (or speedball)
A31C: Crack (e.g. smokable cocaine, rock)
A31D: Powder cocaine (or coke)
A31E: Heroin by itself
A31F: Opiates you didn't have a prescription for
A31G: Hormones or steroids
A31H: Some other drugs
A31I: None of the above

A32. Have you ever been in formal treatment program for drug or alcohol use?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

A34. Have you ever been arrested?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

A35. How much time have you spent in jail or prison in your life?
1= None, never been to prison or jail
2= Less than 1 month
3 = 1 month to 1 year
4 = More than 1 year
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

A36. I'd like you to tell me which of the following statements best describes your sexual behavior?
1 = I have sex only with men
2 = I have sex mostly with men, but occasionally with women
3 = I have sex with about equal numbers of men and women
4 = I have sex mostly with women, but occasionally with men
5 = I have sex only with women
8 = Refuse to answer

A37. How many different sexual partners have you had in the past month?
0-1000 = range
9997 = Don't Know
9998 = Refuse to Answer
9999 = Not Applicable

A38. How many different sexual partners have you had in the past 6 months?
0-1000 = range
9997 = Don't Know
9998 = Refuse to Answer
9999 = Not Applicable

A39. Have you ever given someone money or drugs as payment for sex?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

A40. Have you ever received money or drugs as payment for sex?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

B1. How many people are on the list given by the staff member?
1 – 24
99 = Not Applicable

Calculated Variables – Network Member

B1ASP	1st person on list	Derived from B1A
B1BSP	2nd person on list	Derived from B1B
B1CSP	3rd person on list	Derived from B1C
B1DSP	4th person on list	Derived from B1D
B1ESP	5th person on list	Derived from B1E
B1FSP	6th person on list	Derived from B1F
B1GSP	7th person on list	Derived from B1G
B1HSP	8th person on list	Derived from B1H
B1ISP	9th person on list	Derived from B1I
B6ASP	10th person on list	Derived from B6A
B6BSP	11th person on list	Derived from B6B

B6CSP	12th person on list	Derived from B6C
B6DSP	13th person on list	Derived from B6D
B6ESP	14th person on list	Derived from B6E
B6FSP	15th person on list	Derived from B6F
B6GSP	16th person on list	Derived from B6G
B6HSP	17th person on list	Derived from B6H
B6ISP	18th person on list	Derived from B6I
B10CSP	19th person on list	Derived from B10C
B10DSP	20th person on list	Derived from B10D
B11CSP	21st person on list	Derived from B11C
B11DSP	22nd person on list	Derived from B11D
B12CSP	23rd person on list	Derived from B12C
B12DSP	24th person on list	Derived from B12D

B13. In the past 6 months, who on this list of people have you done drugs with?

DRUGMNA	Derived from B1ASP	1st person on original list
DRUGMNB	Derived from B1BSP	2nd person on original list
DRUGMNC	Derived from B1CSP	3rd person on original list
DRUGMND	Derived from B1DSP	4th person on original list
DRUGMNE	Derived from B1ESP	5th person on original list
DRUGMNF	Derived from B1FSP	6th person on original list
DRUGMNG	Derived from B1GSP	7th person on original list
DRUGMNH	Derived from B1HSP	8th person on original list
DRUGMNI	Derived from B1ISP	9th person on original list
DRUGMNJ	Derived from B6ASP	10th person on original list
DRUGMNK	Derived from B6BSP	11th person on original list
DRUGMNL	Derived from B6CSP	12th person on original list
DRUGMNM	Derived from B6DSP	13th person on original list
DRUGMNN	Derived from B6ESP	14th person on original list
DRUGMNO	Derived from B6FSP	15th person on original list
DRUGMNP	Derived from B6GSP	16th person on original list
DRUGMNQ	Derived from B6HSP	17th person on original list
DRUGMNR	Derived from B6ISP	18th person on original list
DRUGMNS	Derived from B10CSP	19th person on original list
DRUGMNT	Derived from B10DSP	20th person on original list
DRUGMNU	Derived from B11CSP	21st person on original list
DRUGMNV	Derived from B11DSP	22nd person on original list
DRUGMNW	Derived from B12CSP	23rd person on original list
DRUGMNX	Derived from B12DSP	24th person on original list

Calculated variable for DRUGMN [A-X] (where drug use = 1) with Network Members B1ASP-B12DSP

Example:

DRUG1 = IF (DRUGMNA = 1, B1ASP,’’’’)

Calculated for DRUG1 to DRUG24

B22. In the past 6 months, have you injected any drugs?

0 = No
1 = yes
7 = Don't Know
8 = Refuse to Answer
9 = Not Applicable

D27. In the past 6 months, what kinds of drugs do you do with the people you have done drugs with?
D27A: Marijuana
D27B: Amphetamines/Methamphetamines
D27C: Heroin and cocaine mixed together (or speedball)
D27D: Crack (e.g. smokable cocaine, rock)
D27E: Powder cocaine (or coke)
D27F: Heroin by itself
D27G: Opiates you didn't have a prescription for
D27H: Sedative you didn't have a prescription for
D27I: Other drugs
D27J: None of the above
D27K: Refuse to answer

D28. In the past 6 months, have you ever sold drugs to any of these people?
Calculated D28A to D28X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

D29. In the past 6 months, have you ever copped the drugs for any of these people? By "Copped", we mean bought the drugs for him or her in exchange for a taste of the drugs?
Calculated D29A to D29X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D30. In the past 6 months, have you ever had sex with any of these people in order to obtain the drugs?
Calculated D30A to D30X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D31. In the past 6 months, have you ever sold needles or syringes to any of these people?
Calculated D31A to D31X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D32. In the past 6 months, have you ever bought needles or syringes from any of these people?
Calculated D32A to D32X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D33. In the past 6 months, have you ever gone with any of these people to a shooting gallery or other location where injecting equipment was available to share?
Calculated D33A to D33X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

NO D34.

D35.Did you ever inject any of these people?
Calculated D35A to D35X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D36. Did any of these people ever inject you?
Calculated D36A to D36X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D37. Did you ever share needles with any of these people?
Calculated D37A to D37X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D38. Did you ever share injection equipment with any of these people?
Calculated D38A to D38X using DRUG1 to DRUG24, where DRUG# represents an individual identified as someone who has used drugs with the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

D39. How about 1 year ago, was there anyone else that you were doing drugs with then that didn't name today?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

D40. If so, how many individuals would you say you were doing drugs with a year ago that you did not name today?
0-996 = range
997 = Don't Know
998 = Refuse to Answer
999 = Not Applicable

D41. What are all of the reasons you are no longer doing drugs with these people?

D41A. Someone died
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

D41B. Someone is in prison
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer

9 = Not Applicable

D41C. Someone moved out of the area
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

D41D. We had a falling out or fight and now no longer hang out together
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

D41E. We are no longer in touch
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

D41F. Other
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

Calculated Variable
Example:
NODRUG1 = IF (DRUGMNA = 0, B1ASP, "")
Calculated for NODRUG1 to NODRUG24

E39. Do any of the people not know that you do drugs?
Calculated E39A to E39X using NODRUG1 to NODRUG24, where NODRUG# represents an individual identified as someone who does not use drugs with the respondent
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

E40. Have any of these people ever encouraged you to stop using drugs?
Calculated E40A to E40X using NODRUG1 to NODRUG24, where NODRUG# represents an individual identified who does not use drugs with the respondent
0 = No

1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

E41. In the past 6 months, who on this list of people have you had sex with?
Example: SEXMNA calculated with B1ASP
Calculated for SEXMNA to SEXMNX
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

Calculated Variable
Example: SEX1 = IF (SEXMNA = 1, B1ASP, "")
Calculated for SEX1 to SEX24

F39. Have you had unprotected sex, (i.e., sex without a condom) with any of these people?
Calculated F39A to F39X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F40. Were any of the sex partners that you named also male?
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F41. Have you ever participated in group sex with any of these people?
Calculated F41A to F41X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F42. In the past 6 months, have you given oral sex to any of these people?
Calculated F42A to F42X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes

97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F43. In the past 6 months, have you ever received oral sex from any of these people?
Calculated F43A to F43X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F44. In the past 6 months, have you ever had <u>vaginal</u> sex with any of these people?
Calculated F44A to F44X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F45. In the past 6 months, have you ever had <u>anal</u> sex with any of these people?
Calculated F45A to F45X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

Calculated Variable
Example: ANAL1 = IF(F454A = 1, SEX1, "")
Calculated for ANAL1 to ANAL24

F46. In the past 6 months, of the partners who are male partners, have you ever had anal sex where you were on the "bottom", where his penis was in your anus, with any of these people?
Calculated F46A to F46X using ANAL1 to ANAL24, where ANAL# represents an individual identified as someone who has been an anal sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F47. In the past 6 months, of the partners who are male partners, have you ever had anal sex where you were on "top", where your penis was in his anus, with any of these people?(
Calculated F47A to F47X using ANAL1 to ANAL24, where ANAL# represents an individual identified as someone who has been an anal sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F48. Of the people on this list who are not male sex partners, is there anyone that you would not want to know for whatever reason that you have sex with men?
Calculated F48A to F48X using SEX1 to SEX24, where SEX# represents an individual identified as someone who has been a sexual partner of the respondent.
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F49. How about 1 year ago, was there anyone else that you were having sex with that you didn't name today?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

F50. If so, how many individuals would you say you were having sex with a year ago that you didn't name today?
0-996 = range
997 = Don't Know
998 = Refuse to Answer
999 = Not Applicable

F51. What are all of the reasons you are no longer having sex with these people?
Calculated F51A to F51G with answer options, these questions are not asked for specific individual sexual partners.

F51A. Someone died
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51B. Someone is in prison
0 = No

1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51C. Someone moved out of the area
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51D. We had a falling out or fight and now no longer hang out together
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51E. We are no longer in touch
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51F. They were short-term sex or trade partners
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

F51G. Other
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

B_10a. Imagine a situation where you have a friend who came to visit your from out of town, and this friend wants to try to meet a new sexual partner or to buy some drugs. Of the people you have listed, is there anyone who could help you find sexual partners or drugs?
Calculated B10AA to B10AX using B1ASP to BD12DSP (individuals identified from the original network list)
0 = No
1 = yes
97 = Don't Know

98=Refuse to Answer
99 = Not Applicable

B11_A. If you wanted to talk to someone about private and personal things or you need advice, is there anyone from the list you provided so far that you can talk to?
Calculated B11AA to B11AX using B1ASP to BD12DSP (individuals identified from the original network list)

0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

B12_A. Is there anyone on the list who would give up some of their time and energy to help you, things like going to places, helping you do some work around the house, going to the store for you, and other things like this?
Calculated B12AA to B12AX using B1ASP to BD12DSP (individuals identified from the original network list)
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

B12_B. Is there anyone on the list who would give up some of their money to help you, like lending you $25 or more or something that was valuable?
Calculated B12BA to B12BX using B1ASP to BD12DSP (individuals identified from the original network list)
0 = No
1 = yes
97 = Don't Know
98=Refuse to Answer
99 = Not Applicable

B_13. Are there additional people that you do drugs with or that you have had sex with in the past 6 months who you didn't mention because you were not able to recall their names?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

B_14. If so, how many people would you say who you have done drugs with or have had sex within the past 6 month who you have not named?
0-996 = range
997 = Don't Know
998 = Refuse to Answer

999 = Not Applicable

B_15. Are there additional people that you do drugs with and/or that you have had sex with in the past 6 months who you didn't mention because you were concerned about maintaining their anonymity or confidentiality?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

B_16. If yes, how many are there that you didn't name because your concern of their confidentiality?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

B_17. Suppose that a friend came to town and wanted to go some places to try to meet a new sexual partner or to buy some drugs, do you know of any places where you could tell them to go?
0 = No
1 = yes
7 = Don't Know
8=Refuse to Answer
9 = Not Applicable

B_17a. Would you give me the name of the first place?
Calculated Variable
PLACE1 = IF (B17A = "" OR B17A = .DK or B17A = .REF OR B17A = .NA, "", B17A)

B_17b. If there is anywhere else that you have not named already that you can think of where you would tell your friend to go, please give me the name of this place.
Calculated Variable
PLACE2 = IF (B17B = "" OR B17B = .DK or B17B = .REF OR B17B = .NA, "", B17B)

B_17c. If there is anywhere else that you have not named already that you can think of where you would tell your friend to go, please give me the name of this place.
Calculated Variable
PLACE3 = IF (B17C = "" OR B17C = .DK or B17C = .REF OR B17C = .NA, "", B17C)

B_18a. What type of place is [Response to B_17a]?
1 = Bar/Restaurant/Club
2 = Internet
3 = Cruising Area for Sex Partners (e.g. Park or street)
4 = Friend's House or Apartment
5 = Adult-oriented Business (e.g. Video Store or Bookstore)
6 = Bathhouse, Massage Parlor, Strip Club or Sex Club

7 = Crack House of Shooting Gallery
8 = Hotel
9 = Public Recreational Area (e.g., Bowling Alley, Shopping Mall)
10 = Other
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

B_19a. Which city (or what is the closest city) is [Response to B_17a] located in?
1 = Durham
2 = Raleigh
3 = Smithfield
4 = Siler City
5 = Not applicable, internet
6 = Other
7 = Don't Know
8 = Refuse to Answer
9 = Not Applicable

B_18b. What type of place is [Response to B_17b]?
1 = Bar/Restaurant/Club
2 = Internet
3 = Cruising Area for Sex Partners (e.g. Park or street)
4 = Friend's House or Apartment
5 = Adult-oriented Business (e.g. Video Store or Bookstore)
6 = Bathhouse, Massage Parlor, Strip Club or Sex Club
7 = Crack House of Shooting Gallery
8 = Hotel
9 = Public Recreational Area (e.g., Bowling Alley, Shopping Mall)
10 = Other
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

B_19b. Which city (or what is the closest city) is [Response to B_17b]? located in?
1 = Durham
2 = Raleigh
3 = Smithfield
4 = Siler City
5 = Not applicable, internet
6 = Other
7 = Don't Know
8 = Refuse to Answer
9 = Not Applicable

B_18c. What type of place is [Response to B_17c]?
1 = Bar/Restaurant/Club
2 = Internet

3 = Cruising Area for Sex Partners (e.g. Park or street)
4 = Friend's House or Apartment
5 = Adult-oriented Business (e.g. Video Store or Bookstore)
6 = Bathhouse, Massage Parlor, Strip Club or Sex Club
7 = Crack House of Shooting Gallery
8 = Hotel
9 = Public Recreational Area (e.g., Bowling Alley, Shopping Mall)
10 = Other
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

B_19c. Which city (or what is the closest city) is [Response to B_17c] located in?
1 = Durham
2 = Raleigh
3 = Smithfield
4 = Siler City
5 = Not applicable, internet
6 = Other
7 = Don't Know
8 = Refuse to Answer
9 = Not Applicable

B_20a – B_20x. How old is _____?
B_20a – B_20x derived by asking the age from individuals listed on the respondent's original network (B1ASP – B12DSP)

B_20y1. Of the people on this list, please indicate which individuals are male?
B20Y1A – B20Y1X derived by asking the gender from the individuals listed on the respondent's original network (B1ASP – B12DSP)

B_20Y2. Of the people on this list, please indicate which individuals are white?
B20Y2A – B20Y2X derived by asking the race/ethnicity of the individuals listed on the respondent's original network (B1ASP – B12DSP)

B_20Y3. Of the people on this list, please indicate which individuals are African American?
B20Y3A – B20Y3X derived by asking the race/ethnicity of the individuals listed on the respondent's original network (B1ASP – B12DSP)

G50. What is [____]'s relationship to you?
G50A- G50X derived by asking individuals listed on the respondent's original network (B1ASP – B12DSP)
1 = Sex partner
2 = Main sex partner
3 = Boyfriend/girlfriend
4 = Friend
5 = Acquaintance
6 = Spouse

7 = Client
8 = Brother
9 = Sister
10 = Mother
11 = Father
12 = Neighbor
13 = Roommate
14 = Co-worker
15 = Minister
16 = Doctor or Nurse
17 = Grandparent
18 = Aunt, uncle, cousin or other non-nuclear family member
19 = Other
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G51. On a scale of 1 to 10, how close are you to [_____], with 1 as "not close at all" and 10 as "the closest"?
G51A- G51X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
1 = 1
2 = 2
3 = 3
4 = 4
5 = 5
6 = 6
7 =7
8 = 8
9 = 9
10 = 10
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52a. Of the people on the list, please indicate if you met any of these individuals at [PLACE 1]?
G52AA – G52AX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52b. Of the people on the list, please indicate if you met any of these individuals at [PLACE 2]?
G52BA – G52BX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No

1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52c. Of the people on the list, please indicate if you met any of these individuals at [PLACE 3]?
G52CA – G52CX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52d. Of the people on the list, please indicate if you met any of these individuals on the internet?
G52DA – G52DX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52e. Of the people on the list, please indicate if you met any of these individuals while at work, at school or at church?
G52EA – G52EX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G52f. Of the people on the list, please indicate if you met any of these individuals in prison or jail?
G52FA – G52FX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G53a. Is there anyone on this list who works full-time?
G53AA – G53AX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes

97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G53b. Is there anyone on this list who works part-time?
G53BA – G53BX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
2 = No
3 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G53c. Is there anyone on this list who is unemployed or disabled?
G53CA – G53CX derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G54. Please indicate if there is anyone on this list who you support financially or with food or anything else?
G54A – G54X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G55. Please indicate if there is anyone on this list who pays or contributes to your rent or bills or to food or groceries?
G55A – G55X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G56. Please indicate if there is anyone on this list who has been in prison or jail?
G56A – G56X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know

98 = Refuse to Answer
99 = Not Applicable

G60. Of the people on this list, please indicate which individuals you have known for less than 1 year?
G60A – G60X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G61. Of the people on this list, please indicate which individuals you have known for more than 10 years?
G61A – G61X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G62. Of the people on this list, please indicate which individuals you talk with or see every day?
G62A – G62X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G63. Of the people on the list, please indicate which individuals you talk with or see a few times a year or less?
G63A – G63X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G64. Of the people on this list, please indicate which individuals live in a different city from the city that you live in?
G64A – G64X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes

97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G65. Of the people on this list, please indicate which individuals live in another state (i.e., outside of North Carolina)
G65A – G65X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G66. Of the people on this list, does anyone have HIV or AIDS?
G66A – G66X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G67. Of the people on this list, does anyone have Hepatitis C? G67A – G67X
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G68. Of the people on this list, did you give a Rural/Urban Health study coupon to anyone?
G68A – G68X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

G69. Of the people on this list, did anyone give a Rural/Urban Health study coupon to you?
G69A – G69X derived by asking about the individuals listed on the respondent's original network (B1ASP – B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70a. Who on this list spends time or hangs out with [B1ASP]?
H70AB-H70AX derived by asking about the individuals listed on the respondent's original network (starting with 2nd person on original list B1BSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70aa. Does [B1ASP] hang out with [B1BSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70b. Who on the list spends time or hangs out with [B1BSP]?
H70BC-H70BX derived by asking about the individuals listed on the respondent's original network (starting with 3rd person on original list B1CSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70bb. Does [B1BSP] hang out with [B1CSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70c. Who on the list spends time or hangs out with [B1CSP]?
H70CD – H70CX derived by asking about the individuals listed on the respondent's original network (starting with 4th person on original list B1DSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70cc. Does [B1CSP] hang out with [B1DSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70d. Who on the list spends time or hangs out with [B1DSP]?
H70DE – H70DX derived by asking about the individuals listed on the respondent's original network (starting with 5th person on original list B1ESP through the last person, B12DSP)

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70dd. Does [B1DSP] hang out with [B1ESP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70e. Who on the list spends time or hangs out with [B1ESP]?
H70EF – H70EX derived by asking about the individuals listed on the respondent's original network (starting with 6th person on original list B1FSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70ee. Does [B1ESP] hang out with [B1FSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70f. Who on the list spends time or hangs out with [B1FSP]?
H70FG – H70FX derived by asking about the individuals listed on the respondent's original network (starting with 7th person on original list B1GSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70ff. Does [B1FSP] hang out with [B1GSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70g. Who on the list spends time or hangs out with [B1GSP]?
H70GH – H70GX derived by asking about the individuals listed on the respondent's original network (starting with 8th person on original list B1HSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70gg. Does [B1GSP] hang out with [B1HSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70h. Who on the list spends time or hangs out with [B1HSP]?
H70HI – H70HX derived by asking about the individuals listed on the respondent's original network (starting with 9th person on original list B1ISP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70hh. Does [B1HSP] hang out with [B1ISP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70i. Who on the list spends time or hangs out with [B1ISP]?
H70IJ – H70IX derived by asking about the individuals listed on the respondent's original network (starting with 10th person on original list B6ASP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70ii. Does [B1ISP] hang out with [B6ASP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70j. Who on the list spends time or hangs out with [B6ASP]?
H70JK – H70JX derived by asking about the individuals listed on the respondent's original network (starting with 11th person on original list B6BSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70jj. Does [B6ASP] hang out with [B6BSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70k. Who on the list spends time or hangs out with [B6BSP]?
H70KL – H70KX derived by asking about the individuals listed on the respondent's original network (starting with 12th person on original list B6CSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70kk. Does [B6BSP] hang out with [B6CSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70l. Who on the list spends time or hangs out with [B6CSP]?
H70LM – H70LX derived by asking about the individuals listed on the respondent's original network (starting with 13th person on original list B6DSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70ll. Does [B6CSP] hang out with [B6DSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70m. Who on the list spends time or hangs out with [B6DSP]?
H70MN – H70MX derived by asking about the individuals listed on the respondent's original network (starting with 14th person on original list B6ESP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70mm. Does [B6DSP] hang out with [B6ESP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70n. Who on the list spends time or hangs out with [B6ESP]?
H70NO – H70NX derived by asking about the individuals listed on the respondent's original network (starting with 15th person on original list B6FSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70nn. Does [B6ESP] hang out with [B6FSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70o. Who on the list spends time or hangs out with [B6FSP]?
H70OP – H70OX derived by asking about the individuals listed on the respondent's original network (starting with 16th person on original list B6GSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70oo. Does [B6FSP] hang out with [B6GSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70p. Who on the list spends time or hangs out with [B6GSP]?
H70PQ – H70PX derived by asking about the individuals listed on the respondent's original network (starting with 17th person on original list B6HSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70pp. Does [B6GSP] hang out with [B6HSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70q. Who on the list spends time or hangs out with [B6HSP]?
H70QR – H70QX derived by asking about the individuals listed on the respondent's original network (starting with 18th person on original list B6ISP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70qq. Does [B6HSP] hang out with [B6ISP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70r. Who on the list spends time or hangs out with [B6ISP]?
H70RS – H70RX derived by asking about the individuals listed on the respondent's original network (starting with 19th person on original list B10CSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70rr. Does [B6ISP] hang out with [B10CSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70s. Who on the list spends time or hangs out with [B10CSP]?
H70ST – H70SX derived by asking about the individuals listed on the respondent's original network (starting with 20th person on original list B10DSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70ss. Does [B10CSP] hang out with [B10DSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70t. Who on the list spends time or hangs out with [B10DSP]?
H70TU – H70TX derived by asking about the individuals listed on the respondent's original network (starting with 21st person on original list B11CSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70tt. Does [B10DSP] hang out with [B11CSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70u. Who on the list spends time or hangs out with [B11CSP]?
H70UV – H70UX derived by asking about the individuals listed on the respondent's original network (starting with 22nd person on original list B11DSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70uu. Does [B11CSP] hang out with [B11DSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70v. Who on the list spends time or hangs out with [B11DSP]?
H70VW – H70VX derived by asking about the individuals listed on the respondent's original network (starting with 23rd person on original list B12CSP through the last person, B12DSP)
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70vv. Does [B11DSP] hang out with [B12CSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

H70w. Does [B12CSP] hang out with [B12DSP]?
0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
99 = Not Applicable

Table 4.15 Unadjusted and adjusted odds ratios for selling sex for drugs or money using explanatory variables in count format (N = 201)

					Full Model				Best Model			
	OR	**95% CI**		***p***	**AOR**	**95% CI**		***p***	**AOR**	**95% CI**		***p***
Intercept	--				0.13	(0.03	0.59)	0.0084	0.09	(0.02	0.33)	0.0004
Composition												
History of incarceration	**1.28***	(0.99	1.65)	0.0618	1.07	(0.77	1.49)	0.6956	1.03	(0.77	1.38)	0.8210
Employed	0.90	(0.70	1.17)	0.4376	**0.63****	(0.43	0.93)	0.0199	--			--
Drug partner	1.13	(0.96	1.33)	0.1459	1.09	(0.88	1.35)	0.4213	--			--
Sex partner	**1.31****	(1.09	1.57)	0.0044	**1.37****	(1.05	1.78)	0.0185	**1.30****	(1.06	1.59)	0.0122
Social Support Function												
Emotional support	1.01	(0.91	1.11)	0.8515	**0.86***	(0.73	1.02)	0.0775	**--**			**--**
Instrumental support	1.15	(0.92	1.43)	0.2078	1.30	(0.84	2.00)	0.2336	**--**			--
Informational support	**1.21***	(0.97	1.51)	0.0918	1.28	(0.84	1.96)	0.2473	1.19	(0.90	1.56)	0.2196
Appraisal support	**1.47***	(0.99	2.19)	0.0589	1.40	(0.82	2.39)	0.2216	1.23	(0.73	2.08)	0.4301

*p≤ 0.10, **p≤ 0.05

APPENDIX E: AIM 2 EXPLANATORY VARIABLES IN COMPOSITE FORMAT

Table 4.16 Testing null hypotheses of equality producing p values for the composite explanatory variables predicting the sale of sex for drugs or money (N = 201)

	p
Composition	
History of incarceration*	**0.017**
Employed	0.395
Drug partner	0.278
Sexual partner	0.556
Social Support Function	
Emotional support	0.611
Instrumental support	0.569
Informational support	0.395
Appraisal support	0.453

*p≤ 0.05

Table 4.17 Unadjusted odds ratios for the sale of sex for drugs or money using explanatory variables in composite format (N = 201)

	OR	95% CI	*p*
Composition			
History of incarceration			
Group 1	3.13	(0.73 13.19)	0.124
Group 2	**2.14****	(1.10 4.18)	0.025
Group 3	**2.97*****	(1.66 5.36)	0.000
Group 4	Ref		--
Employed			
Group 1	Ref		--
Group 2	0.31	(0.34 5.35)	0.662
Group 3	0.58	(0.18 1.86)	0.357
Group 4	1.00	(0.34 2.90)	0.999
Drug partner			
Group 1	1.04	(0.43 2.51)	0.929
Group 2	**2.13****	(1.09 4.13)	0.025
Group 3	1.09	(0.64 1.84)	0.750
Group 4	Ref		--
Sexual partner			
Group 1	1.77	(0.81 3.87)	0.156
Group 2	1.59	(0.64 3.96)	0.320
Group 3	1.28	(0.64 2.54)	0.484
Group 4	Ref		--
Social Support Function			
Emotional support			
Group 1	Ref		--
Group 2	0.99	(0.42 2.30)	0.978
Group 3	0.82	(0.37 1.81)	0.623
Group 4	0.55	(0.20 1.47)	0.234
Instrumental support			
Group 1	Ref		--
Group 2	0.95	(0.34 2.66)	0.917
Group 3	0.79	(0.40 1.58)	0.509
Group 4	0.51	(0.17 1.48)	0.214
Informational support			
Group 1	Ref		--
Group 2	0.46	(0.17 1.28)	0.139
Group 3	0.51	(0.18 1.50)	0.223
Group 4	**0.32***	(0.09 1.08)	0.067
Appraisal support			
Group 1	Ref		--
Group 2	**0.36***	(0.11 1.16)	0.081
Group 3	**0.30****	(0.09 0.989)	0.048
Group 4	**0.33****	(0.18 0.92)	0034

*p≤ 0.10, **p≤ 0.05, *** p≤ 0.0005

Table 4.18 Adjusted odds ratios for selling sex for drugs or money using explanatory variables in composite format (N = 201)

	Full Model			Best Model		
	AOR	**95% CI**	***p***	**AOR**	**95% CI**	***p***
Intercept	0.07	(0.01 0.37)	0.002	0.10	(0.02 0.43)	0.002
Composition						
History of incarceration						
Group 1	9.20	(0.64 132.04)	0.1023	9.32	(0.57 151.18)	0.116
Group 2	7.50	(0.62 90.87)	0.114	**13.45***	(1.47 123.10)	0.021
Group 3	**2.30***	(0.96 5.53)	0.062	**2.25***	(1.05 4.84)	0.037
Group 4	Ref		--	Ref		--
Employed						
Group 1	Ref		--			
Group 2	4.43	(0.46 42.60)	0.198			
Group 3	**0.41***	(0.16 1.04)	0.062			
Group 4	1.00	(1.00 1.00)	.			
Drug partner						
Group 1	0.45	(0.09 2.20)	0.322	0.43	(0.12 1.57)	0.200
Group 2	1.00	(1.00 1.00)	.	1.00	(1.00 1.00)	.
Group 3	0.58	(0.26 1.31)	0.189	0.59	(0.31 1.12)	0.106
Group 4	Ref		--	Ref-		--
Sexual partner				--		
Group 1	1.60	(0.46 5.54)	0.461	--		
Group 2	1.00	(1.00 1.00)	.	--		
Group 3	1.46	(0.55 3.84)	0.447			
Group 4	Ref		--			
Social Support Function						
Emotional support						
Group 1	Ref		--	**--**		--
Group 2	2.71	(0.77 9.48)	0.119	**--**		0.052
Group 3	0.90	(0.40 2.06)	0.805	**--**		0.469
Group 4	1.00	(1.00 1.00)	.	**--**		.
Instrumental support						
Group 1	Ref		--	--		--
Group 2	2.48	(0.33 18.45)	0.374	--		0.101
Group 3	1.85	(0.51 6.74)	0.349	--		0.157
Group 4	1.00	(1.00 1.00)	.	--		.
Informational support						
Group 1	Ref		--	Ref		
Group 2	**0.07****	(0.01 0.82)	0.034	**0.21***	(0.04 1.01)	
Group 3	0.92	(0.22 3.85)	0.905	1.42	(0.55 3.69)	
Group 4	1.00	(1.00 1.00)	.	1.00	(1.00 1.00)	
Appraisal support						
Group 1	Ref		--	Ref		
Group 2	**0.18****	(0.04 0.90)	0.037	0.26	(0.05 1.30)	
Group 3	0.63	(0.33 1.21)	0.164	0.70	(0.42 1.15)	
Group 4	1.00	(1.00 1.00)	.	1.00	(1.00 1.00)	

*p≤ 0.10

APPENDIX F: TESTING THE ASSUMPTION OF LINEARITY WITH RESPECT TO THE LOGIT

Table 4.19a Mean of outcome variable (A40a) conditional on group membership (N = 201)

		n	Mean	(SD)	Range
Composition					
History of incarceration ***(curvilinear)***					0 - 1
Q1 (0 to LT 0.20)		120	0.23	(0.42)	
Q2 (0.20 to LT 0.40)		37	0.35	(0.48)	
Q3 (0.40 to LT 0.60)		19	0.32	(0.48)	
Q4 (0.60 to LT 0.80)		11	0.64	(0.50)	
Q5 (0.80 to 1.0)		14	0.21	(0.43)	
Employed ***(2 conditions)***					0 - 1
Q1 (0 to LT 0.20)	Condition 1	80	0.31	(0.47)	
Q2 (0.20 to LT 0.40)		32	0.41	(0.50)	
Q3 (0.40 to LT 0.60)		32	0.34	(0.48)	
Q4 (0.60 to LT 0.80)	Condition 2	23	0.17	(0.39)	
Q5 (0.80 to 1.0)		34	0.09	(0.29)	
Drug partner ***(unrecognizable pattern)***					0 - 1
Q1 (0 to LT 0.20)		50	0.26	(0.44)	
Q2 (0.20 to LT 0.40)		14	0.36	(0.50)	
Q3 (0.40 to LT 0.60)		25	0.40	(0.50)	
Q4 (0.60 to LT 0.80)		26	0.19	(0.40)	
Q5 (0.80 to 1.0)		86	0.27	(0.45)	
Sexual partner ***(curvilinear)***					0 - 1
Q1 (0 to LT 0.20)		120	0.23	(0.42)	
Q2 (0.20 to LT 0.40)		37	0.35	(0.48)	
Q3 (0.40 to LT 0.60)		19	0.32	(0.48)	
Q4 (0.60 to LT 0.80)		11	0.64	(0.50)	
Q5 (0.80 to 1.0)		14	0.21	(0.43)	

Table 4.19b Mean of outcome variable (A40a) conditional on group membership (N = 201)

		n	Mean	(SD)	Range
Social Support Function					
Emotional support ***(unrecognizable pattern)***					1 - 10
Q1 (0 to LT 0.20)		15	0.27	(0.46)	
Q2 (0.20 to LT 0.40)		13	0.31	(0.48)	
Q3 (0.40 to LT 0.60)		47	0.26	(0.44)	
Q4 (0.60 to LT 0.80)		84	0.31	(0.47)	
Q5 (0.80 to 1.0)		42	0.24	(0.43)	
Instrumental support ***(3 conditions)***					0 - 1
Q1 (0 to LT 0.20)	Condition 1	90	0.29	(0.46)	
Q2 (0.20 to LT 0.40)		58	0.24	(0.43)	
Q3 (0.40 to LT 0.60)		24	0.29	(0.46)	
Q4 (0.60 to LT 0.80)	Condition 2	6	0.17	(0.41)	
Q5 (0.80 to 1.0)	Condition 3	23	0.35	(0.49)	
Informational support ***(unrecognizable pattern)***					0 - 1
Q1 (0 to LT 0.20)		97	0.26	(0.44)	
Q2 (0.20 to LT 0.40)		60	0.27	(0.45)	
Q3 (0.40 to LT 0.60)		15	0.40	(0.51)	
Q4 (0.60 to LT 0.80)		12	0.33	(0.49)	
Q5 (0.80 to 1.0)		17	0.29	(0.47)	
Appraisal support ***(unrecognizable pattern)***					0 – 0.75
Q1 (0 to LT 0.20)		177	0.28	(0.45)	
Q2 (0.20 to LT 0.40)		17	0.24	(0.44)	
Q3 (0.40 to LT 0.60)		4	0	(0)	
Q4 (0.60 to LT 0.80)		3	0.67	(0.58)	
Q5 (0.80 to 1.0)		--	--	--	

APPENDIX G: SAMPLE SIZE AND POWER CALCULATION

Table 4.20 Proportion of other study respondents' report sale of sex for drugs or money

Network with high drug use	Network with low drug use
46%	10%

Sources of estimations: Bobashev et al., 2009 (21) and Baseman, et al., 1999 (212)

$$\mathbf{n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 [P1(1-P_1) + P_2(1-P_2)]}{(P_1 - P_2)^2}}$$

$Z_{\alpha/2} = 1.96$
$Z_{\beta} = .84$ (when Beta = 0.80)
Alpha = 0.05
2-tailed

n = 21 * 2 groups = 42

$$\mathbf{ICC = \frac{SSex\ BTW - SSex\ w/in}{SSex\ BTW + ((Mbar) - 1) * SSex\ w/in)}}$$

ICC:

0.01 = Small ICC
0.05 = Medium ICC
0.10 = Large ICC

DEFF = (1 + ICC (mbar-1))
DEFF = (1 + .01 (6.97 - 1)) = 1.0597
DEFF = (1 + .05 (6.97 - 1)) = 1.2985
DEFF = (1 + .10 (6.97 - 1)) = 1.597

n' = n (DEFF)

44.5 = 42 (1.0597)
54.5 = 42 (1.2985)
67.07 = 42 (1.597)

Mbar = average # of male respondents for each seed chain

n = sample size based on SRS

DEFF = design effect

APPENDIX H: ASSESSMENT OF COLLINEARITY

Table 4.21 Assessment of collinearity of explanatory variables for Aim 2

Variable	Tolerance	Variance Inflation Factor
History of incarceration	0.886	1.129
Employed	0.769	1.301
Drug partner	0.891	1.122
Sexual partner	0.923	1.083
Emotional support	0.740	1.350
Instrumental support	0.320	3.125
Informational support	0.345	2.898
Appraisal support	0.926	1.080

Table 4.22 Assessment of collinearity of explanatory variables for Aim 3

Variable	Tolerance	Variance Inflation Factor
Type of sexual partnership	0.688	1.453
Drug partnership	0.868	1.152
Biological sex concordance	0.962	1.039
Emotional support	0.724	1.382
Instrumental support	0.574	1.742
Informational support	0.536	1.867
Appraisal support	0.815	1.227

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