TIME SINCE RELEASE FROM INCARCERATION AND HIV RISK BEHAVIORS AMONG WOMEN: THE POTENTIAL PROTECTIVE ROLE OF COMMITTED PARTNERS DURING RE-ENTRY

By

Lauren E. Hearn

A THESIS PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

UNIVERSITY OF FLORIDA

2014

To my family

ACKNOWLEDGMENTS

I would like to thank my mentor, Dr. Nicole Ennis Whitehead, for her support and guidance on this project. I would also like to thank Dr. William Latimer for the invitation to collaborate on the NEURO-HIV study and Dr. Maria Khan for her contributions to this project. Further, I would like to recognize the members of my supervisory committee: Dr. Deidre Pereira, Dr. Catherine Price, and Dr. Brenda Wiens.

This study was supported by Award Number R01DA14498 from the National Institute on Drug Abuse (William W. Latimer, Ph.D., M.P.H., PI).

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AOR	Adjusted Odds Ratio
CI	Confidence Interval
GED	General Educational Development
OR	Odds Ratio
SNAP	Supplemental Nutrition Assistance Program
TANF	Temporary Assistance for Needy Families

Abstract of Thesis Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Master of Science

TIME SINCE RELEASE FROM INCARCERATION AND HIV RISK BEHAVIORS AMONG WOMEN: THE POTENTIAL PROTECTIVE ROLE OF COMMITTED PARTNERS DURING RE-ENTRY

By

Lauren E. Hearn

May 2014

Chair: Nicole Ennis Whitehead
Major: Psychology

After release from incarceration, former female inmates face considerable stressors, which may influence drug use and other risk behaviors that increase risk for HIV infection. Involvement in a committed partnership may protect women against the re-entry stressors that may lead to risky behaviors. The present study investigated the association between time since release from incarceration and HIV risk behaviors and explored whether these associations differed among women with versus without committed partners. Multivariable logistic regression measured adjusted odds ratios (AORs) for the associations between time since release from incarceration (1-6 months ago, and greater than 6 months ago *versus* never incarcerated (the referent)) and HIV-related drug use (past-month binge drinking, crack cocaine smoking, injection drug use) and sexual risk behaviors (condom use, transactional sex, drug and alcohol use before or during sex). Women released within the past 6 months were significantly more likely to have smoked crack cocaine, used injection drugs and engaged in transactional sex in the past month compared to never-incarcerated women and women released more distally. Stratified analyses indicated that incarceration within the past 6 months was

associated with crack cocaine smoking, injection drug use and transactional sex among women without a committed partner yet unassociated with these risk behaviors among those with a committed partner. While the first months following release from incarceration represent a high-risk period for HIV-related risk behaviors, involvement in a committed partnership may protect against these behaviors following release.

CHAPTER 1
INTRODUCTION

Women with an incarceration history represent a vulnerable population for HIV infection, with HIV rates five to fifteen times that of the general female population [1]. Drug-related offenses and transactional sex are the leading causes of women's incarceration [2, 3]. In addition to driving incarceration rates among women, drug use and sexual risk behaviors are strong determinants of HIV infection [4-7]. Among individuals with an incarceration history, most HIV infections are acquired in the community rather than in jail and prison settings [8]. Given that many incarcerated women are in jail or prison as a result of drug use and/or drug trade, it is not surprising that high levels of drug use have been observed among former female inmates following release from incarceration. Extant literature shows that half of all female inmates report drug use or alcohol intoxication within ten months of release [9]. Additionally, high rates of repeated arrests have been reported among women who engage in transactional sex [10]. While the behaviors that lead to women's arrest and incarceration are well documented, the HIV risk behaviors of former female inmates in the community remain poorly understood.

While there is evidence that time since release from incarceration may influence HIV risk behaviors, these studies have been primarily conducted in men. Some studies suggest that the first weeks and months in the community are characterized by high levels of substance use and risky sexual behavior followed by a decline in prevalence, while other studies suggest that the prevalence of these behaviors may remain steady or increase in the months after release [9, 11, 12]. There is a need for additional research on the time frame when risk of engaging in HIV-related risk behaviors is

greatest after release from incarceration and the degree to which incarceration itself may increase risk of these behaviors among women.

Re-entry Stressors

Upon returning to the community, former female inmates face considerable stressors that may contribute to HIV-related drug use and sexual risk behaviors. Following release from incarceration, former inmates have immediate needs for food, clothing, safe housing and medical care [13]. While some states have begun implementing evidence-based transition programs for inmates leaving prison, release from jail is generally very unpredictable, often precluding appropriate planning and transition services [14, 15]. Among women who used drugs prior to incarceration, few women enter or maintain participation in treatment programs after release [16, 17]. In addition to the need for substance use treatment, estimates suggest that 60% to 95% of female inmates have experienced prior physical or sexual abuse or a traumatic event, and approximately one-third of female inmates suffer from a serious mental illness [18-21]. Despite recognizing need for treatment, individuals re-entering the community unsurprisingly often prioritize their subsistence needs and financial needs above seeking substance use or mental health treatment [15].

Achieving stable employment is viewed as critical to not only allow individuals to meet basic needs and pay for legal expenses, but also to increase self-efficacy and to form new, prosocial relationships [22, 23]. However job prospects of former female inmates are often diminished by limited work experience and low educational attainment; slightly more than half of female inmates have completed high school or the General Education Development (GED) testing equivalent [24, 25]. In addition, employer reluctance to hire individuals with a criminal record may create particular

challenges for those with drug-related offenses, as former female inmates with substance abuse problems face greater challenges to finding employment than former inmates convicted of other offenses [4]. Federal assistance programs such as Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) restrict states from providing assistance to individuals convicted of a drug-related felony, though states may modify or scale back this ban [26]. Women who still qualify for federal benefits may need to re-apply for their benefits or request to have the agencies restart their benefits upon their release; both of these processes can take months [27, 28].

Resuming and repairing ties with family members and friends represents an additional priority of women exiting the correctional system. Approximately 60% to 70% of female inmates have at least one child under age 18, and childcare and custody issues represent a significant stressor [29, 30]. In addition, family and friends may pull away due to frustration over a woman's ongoing risky behaviors and arrests [31]. Women who use illicit drugs often receive low levels of financial and emotional support from friends and family; therefore, women may return to drugs to help meet financial challenges and to cope with the stressors of re-entry [9]. In addition, drug users may encounter substance-using acquaintances and the locations where they once purchased or used drugs, making them more likely to use [17, 32, 33]. Women who engage in transactional sex also generally receive little to no support from family members, with nearly 50% leaving home permanently by age 16 [34]. Incarceration also exposes individuals to high-risk networks that may increase drug use and risky sexual behavior upon return to the community [35, 36]. Women exiting jail and prison must

navigate multiple and simultaneous challenges, often without institutional support to facilitate a successful transition back to the community.

The Stress-Buffering Model of Social Support

Social support broadly refers to processes that promote health through the provision of emotional, informational or instrumental (i.e., tangible) resources [37]. Beginning in the 1950s, studies began to emerge demonstrating that individuals who received regular contact with family and friends during the experience of incarceration were less likely to recidivate than individuals with few social ties [38, 39]. Men and women who successfully reintegrate after incarceration often attribute their success to supportive friends and family that provide housing and lend financial and emotional support [40, 41]. The stress-buffering model of Cohen and Wills proposes that social support reduces negative emotional responses to stressful events and promotes more positive and adaptive behavioral responses [42]. Receipt of actual emotional, informational or tangible support can also improve health outcomes through helping resolve the source of stress [37]. Notably, the perception of the availability of support is hypothesized to exert an equal or even greater influence than actual received support on emotional and behavioral responses to stress. Perceived social support is hypothesized to positively influence one's appraisal of the situation and capacity to cope, thereby reducing negative emotional and physiological responses to the stressor (Figure 1-1) [37, 43].

Social Support in the Context of Female Offenders

Social support needs for former female inmates may be higher than that of men; women in general tend to have larger social networks and report stronger emotional bonds with their social ties than men [44]. A model of women's psychological proposed

by Jean Baker Miller in the 1970's asserts the centrality of interpersonal relationships and social connection for women's psychological health. Termed the Relational Model, Miller proposed that seeking connection with others represents a primary motivation for women and that women suffer negative emotional consequences from disrupted social ties [45]. Subsequent research has found that in response to stressful events, women tend to cope by seeking out emotional support from those in their social network, and women may be more susceptible to negative health outcomes, such as depression, in response to low levels of social support [46-48].

Despite the overall low levels of social support documented for women convicted of drug and transactional sex offenses, male romantic partners appear to represent a prominent source of social support in this population. In a sample of female jail inmates, most women reported low perceived social support in general and from friends and family. However, three-fourths of this sample reported emotional support and comfort from a significant other [13]. Despite filling a potentially important source of emotional support, a significant body of literature demonstrates that the presence of a male partner may also exert negative influences on women's health, particularly in contexts where the male partner is abusive, controlling or attaches emotional intimacy to risky behaviors such as needle sharing [49-52]. Male partners in general appear particularly influential for women's substance use and sexual risk behaviors.

The Stone Center Relational Model of Substance Use, derived from Miller's earlier work, explains that women often turn to substance use to initiate or maintain connections with others, and to cope with feelings of stress and isolation [53]. Women may use drugs to connect with drug-using partners, to deal with pain in their

relationships or to cope with the dissolution of a relationship [54, 55]. For some women, involvement in a partnership during re-entry may increase drug risk. There is empirical evidence to suggest marriage or cohabitation with a male partner increases the likelihood of illicit drug use [56, 57]. A partner may also increase risk of sexual transmission of HIV; women may acquiesce to her partner's desire for unprotected sex in order to maintain harmony in the relationship [58]. However, low social support has been associated with more frequent post-release drug use [40]. Because women in particular may experience negative consequences from relationship strain and dissolution, absence of a partner, potentially due to incarceration-related disruption of partnerships, may lead to lower tangible and emotional support among former inmates and to increased risk taking [54].

The Stress-Buffering Model of Social Support

While few studies have examined the relationship between time since release from incarceration and HIV risk behaviors among recently released female offenders, none to our knowledge have examined the potential for involvement in a committed partnership to influence this relationship. Therefore, to better understand risk and protective factors in the post release period, this study explored HIV-related drug use and sexual risk behaviors after release from incarceration and the potential moderating effect of a committed partner on post-release risk behaviors. We used data from female respondents of NEURO-HIV Epidemiologic Study, a study of non-injection and injection drug users in Baltimore, MD to investigate associations between time since release from incarceration and past-month: binge drinking, crack cocaine smoking, injection drug use, transactional sex, condom use, alcohol use before or during sex, and drug use before or during sex. Additionally, we explored whether involvement in a committed

partnership, a relationship lasting at least three months and where the partners cohabitate or are married, affected these associations. We hypothesized that women released from incarceration within the past 6 months would exhibit significantly higher rates of drug use and sexual risk behaviors compared to never-incarcerated women and women released more distally. Further, we anticipated a lower prevalence of HIV risk behaviors among recently-released women who reported a committed partner compared to unpartnered women.

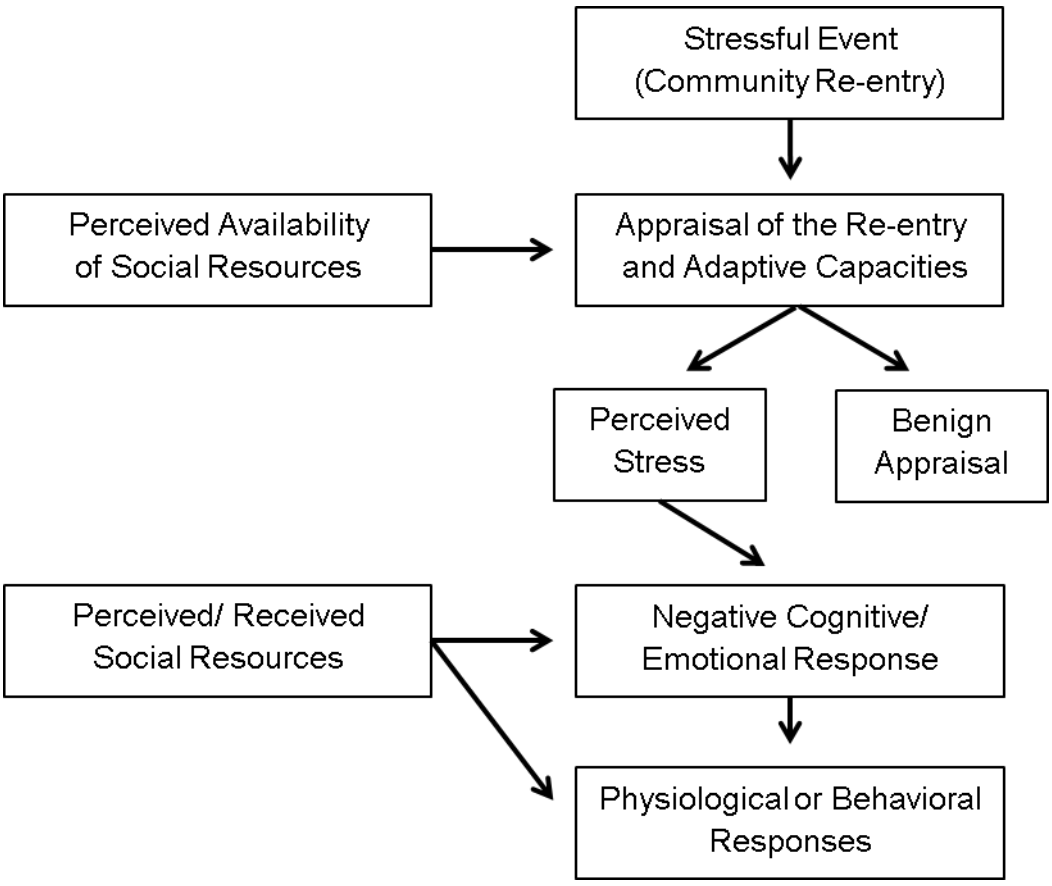

Figure 1–1. Stress-buffering model of social ties and mental health.

Adapted from Cohen S, Underwood LG, Gottlieb BH, 2000.

CHAPTER 2
METHODS

Introduction

The current study used the baseline data female participants included in the NEURO-HIV Epidemiologic Study. The study was approved by the University of Florida's Institutional Review Board and has received annual renewals. The NEURO-HIV Epidemiologic Study is a longitudinal epidemiological examination of neuropsychological, social and behavioral risk factors of HIV, hepatitis B, hepatitis C, and sexually-transmitted infections among injection and non-injection drug users. Study participants were recruited in Baltimore, MD using a variety of community-based outreach strategies, including local newspaper advertisements, street recruitment, and referral; participants were enrolled if they were 18 years of age or older and reported injection or non-injection drug use in the past six months. Trained research staff provided detailed information about the study and obtained informed consent before administering the baseline assessment in interview format. Blood samples were collected by a phlebotomist at the baseline assessment, and HIV antibody testing was performed using standard ELISA screening and confirmatory Western Blots. Participants were subsequently notified of their HIV status and were referred to social services for counseling.

Study Population

The present analyses were conducted on a subset of the 479 female participants who completed the baseline assessment. The final sample size for these analyses (*n* = 450) was reached after excluding participants who were missing data on their

incarceration history (*n* = 15) or their partnership status (*n* = 3). Additionally, participants that reported a release date within the past month were excluded (*n* = 11) to ensure that the behaviors of interest occurred in the community following release from a correctional setting. Sample characteristics are presented in Table 3–1.

Measures

HIV-risk behavior interview

The HIV-risk behavior interview included questions on sociodemographics, medical, educational, and neurodevelopmental histories, and behavioral information about illicit drug use and sexual practices. Drug use questions assessed for drug type, route of administration and frequency of usage over the 30 days preceding the assessment.

Measure of incarceration

Participants were asked if they had ever in their lifetime spent time in juvenile detention, jail, or a correctional facility and were asked the date of their last release. The current study limited the definition of incarceration to individuals who reported serving time in jail or a correctional facility. For the purposes of this study, the experience of jail and the experience of prison were both regarded as disruptive and stressful life events that destabilize individuals' economic opportunities, mental and physical health, and social ties [59, 60]. Participants who reported no lifetime history in either institution were assigned to the Never incarcerated group. Based on the reported last release date, participants with an incarceration history were assigned to Released 1-6 months ago or Released >6 months ago. Previous studies have defined recent incarceration as occurring within the past 6 months [40, 61].

Measure of partnership status

In the baseline assessment, participants were asked their marital status, who they live with, if they had a steady male sexual partner within the past 3 months, and if so, how long that partnership had lasted. The current study defined a *Committed partnership* as a relationship with a main partner lasting at least 3 months and one in which the couple either cohabitates or is married. Participants were assigned to *No committed partner* if their present partnership did not meet the *committed* criteria or if they did not report a steady sexual partner in the past 3 months. The required duration of the partnership (3 months) and the additional requirement of marriage or cohabitation were applied to capture a context where both individuals have expressed commitment to, and potentially support for, the other. A 3-month duration is an accepted length of steady sexual partnerships in previous studies of risk behaviors within the context of a steady sexual partner [62, 63].

Measure of past-month drug use

We examined using the following drugs in the past month (yes/no): binge drinking, smoked crack cocaine, and injection of any drug. These drugs were included because they have been associated with heightened risk of acquiring HIV. Alcohol reduces inhibitions, impairs judgment and has been associated with unprotected sexual encounters and multiple sex partners [64, 65]. In this study, binge drinking was defined according to the National Institute of Alcohol Abuse and Alcoholism guidelines as four or greater alcoholic beverages per occasion for women [66]. Crack cocaine has also been associated with impulsivity and risky sexual behaviors, while injection drug use directly facilitates virus transmission [67-69]. Additionally, we examined sharing injection

equipment in the past month (yes/no), which encompassed sharing needles, cookers, cottons, and/or rinse water.

Measure of past-month sexual risk behaviors

We examined report of the following behaviors in the past month (yes/no): transactional sex, alcohol use before/during sex, drug use before/during sex, and condom use at last sex. Alcohol and drug use before or during sex have been associated with unprotected sexual encounters and risky sexual partners [15, 70, 71]. Condom use at last sex is considered a valid indicator of typical condom use behaviors over longer periods of time [72].

Sociodemographic and other potential confounding variables

Characteristics that were examined as potential confounders in the analyses included race (dichotomized as Black or non-Black), self-reported history of psychopathology (an emotional/ behavioral condition that was treated by a psychologist/ psychiatrist), educational level (dichotomized to those with less than a high school diploma or GED equivalent, and those with at least a high school diploma or equivalent), lifetime number of years incarcerated, past six-month employment history (employment at either a regular or temporary job), and biologically-confirmed HIV infection. Individuals that tested positive for HIV were retained in the analyses in order to better appreciate the behaviors of former female inmates within the community. Previous studies of risk factors for HIV and sexually-transmitted infections have included individuals that self-reported or tested positive for the infection(s) of interest [32, 61, 73]. The majority of the individuals assigned to the non-Black racial group identified as White (96%), with the remainder identifying as Hispanic/ Latina (2%), Native American (1%), and mixed race (1%).

Statistical Analysis

The primary goals of this study were to: investigate the main effect of incarceration history on past-month HIV risk behaviors, and to explore the potential moderating effect of partnership status on this relationship. Preliminary chi-square analyses were conducted to determine whether significant differences in HIV risk behaviors were found between HIV-positive and HIV-negative. In the overall sample, we first examined associations between the sociodemographic and other potentially confounding variables with incarceration history and past-month drug use using the chi-square test. The odds ratio and 95% confidence interval (CI) for the main effect of incarceration history on past-month risk behaviors was then calculated for each of the drug outcomes using binary logistic regression. This regression was re-run, stratifying by partnership status to better appreciate the effect of a committed partner on these relationships. To obtain the adjusted odds ratios, the confounding variables that were associated with incarceration history ($p < .05$) were entered in the first step of the model and incarceration history was entered in the second step. Covariates included: age, history of psychopathology, and educational attainment.

CHAPTER 3
RESULTS

Sociodemographics

Majority of the sample identified as Black (71%), and no significant racial differences were found across groups based on incarceration history. Socio-demographic variables that were significantly associated with incarceration history included: age, educational attainment, and history of psychopathology. Specifically, never-incarcerated women were younger than women who reported an incarceration history and reported a lower prevalence of past mental illness. Additionally, a significantly higher percentage of never-incarcerated women reported obtaining a high school degree or GED equivalent. Women that tested positive for HIV were retained in the sample, as preliminary analyses did not find significant differences in HIV risk behaviors, with the exception of condom use, based on HIV status. There were no significant differences in HIV prevalence based on incarceration history.

Incarceration History

Majority of the sample had spent time in either jail or prison, with 17% of the sample released 1-6 months ago (Table 3–1). Fifty-seven percent of the sample was released greater than six months ago. The two groups of previously-incarcerated women did not differ in lifetime total years spent incarcerated, $t(329) = .02$, $p = .90$.

Associations between incarceration history and past-month drug use

Recent incarceration (i.e., within the past 1–6 months) was strongly associated with past-month crack cocaine smoking (odds ratio (OR) = 2.86, 95% confidence interval (CI): 1.56–5.23). There was also a trend towards significance for the association between recent incarceration and binge drinking ($p = .08$) and for the association

between recent incarceration and injection drug use (p = .082). After adjusting for confounding variables, the pattern of significance remained unchanged for crack cocaine smoking. Sharing injection equipment had a very low prevalence in the sample (2.4%) and thus was excluded from analyses.

Associations between incarceration history and past-month sexual risk behavior

Recent incarceration was associated with past-month transactional sex (OR = 11.30, 95% CI: 4.05–31.5). However these analyses are considered exploratory due to the low prevalence of this behavior reported in the sample. The other sexual risk behaviors (condom use at last sex, alcohol use before/during sex, and drug use before/during sex) did not differ significantly based on incarceration history.

Interaction with partnership status

The sample was stratified by committed partnership status, and the adjusted odds ratios are presented in Table 3–2. Recently-released women without a committed partner were more likely to smoke crack cocaine (AOR = 2.55, 95% CI: 1.22–5.32) and engage in injection drug use (AOR = 2.66, 95% CI: 1.18–6.01). Additionally, they were more likely to engage in transactional sex (AOR = 11.3, 95% CI: 3.65–34.9), though this result should be interpreted with caution due to the low overall prevalence of the behavior in the sample. Among those with a committed partner, no significant differences were observed between never- and recently-incarcerated women for smoked crack cocaine, injection drug use, and transactional sex.

Table 3–1. Demographic, drug use, and sexual risk behavior comparisons by incarceration history

Variable	Entire Sample		Never Incarcerated		Released 1-6 months ago		Released >6 months ago		Test statistics	
	M or N	S.D. or %	M or N	S.D. or %	M or N	S.D. or %	M or N	S.D. or %	χ2 or F	p-value
N	450		120	26.7	75	16.7	255	56.7		
Age	35.89	9.31	32.43	10.96	35.72	7.99	37.56	8.37	13.04	<0.001
Race/ethnicity										
Black	319	70.9	82	68.3	46	61.3	191	74.9	9.2	0.056
Non-Black	131	29.1	38	31.7	29	38.7	64	25.1		
Education									13.56	0.001
< High School	212	47.1	39	32.8	39	52.0	134	52.5		
High school or GED	237	52.7	80	67.2	36	48.0	121	47.5		
Partnership status									10.61	0.005
Committed partner	167	37.1	36	30.0	20	26.7	111	43.5		
Lifetime years incarcerated	1.62	3.55	-	-	2.27	4.14	2.35	4.06	.02	0.90
History of psychopathology	290	64.4	67	55.8	53	70.7	170	67.2	5.99	0.05
Employed past 6 months	153	34.0	50	41.7	25	33.3	78	30.7	4.38	0.11
HIV+	36	8.0	9	7.5	2	3.2	25	13.0	5.21	0.074
Past 30 day sex risk behaviors										
Transactional sex	46	10.2	6	5.0	24	32.0	16	6.3	46.66	<0.001
Condom used at last sex	150	33.3	43	36.4	25	35.7	82	32.3	0.6	0.74
Used alcohol before/during sex	91	20.2	22	18.3	19	25.3	50	19.6	1.54	0.46
Used drugs before/during sex	158	34.0	45	37.5	34	45.3	79	31.0	5.65	0.059
Past 30 day drug use										
Binge drinking	110	24.4	28	23.5	26	35.1	56	22.5	5.04	0.08
Smoked crack cocaine	160	35.6	33	27.5	39	52.0	88	34.5	12.37	0.002
Injection drug use	123	27.3	32	26.7	29	38.7	62	24.3	6.05	0.049
Risky injection practice	11	2.4	2	1.7	0	0	9	3.5	-	-

a N may vary slightly according to missing data

Table 3–2. Odds ratios and 95% CI's for association between incarceration history & HIV-related drug use in past month, by committed partnership status

	Entire Sample		Entire Sample		No Committed Partner	
Risk Behavior; % Reporting Behavior	Unadjusted OR[a] (CI[b])	*p*	Adjusted OR[c] (CI[b])	*p*	Unadjusted OR[a] (CI[b])	*p*
Smoked Crack Cocaine						
Never Incarcerated (N = 122) 28%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 35%	1.39 (.86-2.23)	0.18	1.14 (.69-1.91)	0.59	1.19 (.67-2.11)	0.56
Released 1-6 months ago (N = 75) 52%	2.86 (1.56-5.23)	0.001	2.61 (1.39-4.87)	0.003	2.68 (1.32-5.41)	0.006
Injection Drug Use						
Never Incarcerated (N = 122) 27%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 34%	.77 (.46-1.28)	0.62	1.02 (.60-1.74)	0.07	.91 (.46-1.79)	0.78
Released 1-6 months ago (N = 75) 39%	1.62 (.87-3.01)	0.08	1.9 (.99-3.63)	0.052	2.08 (.96-4.49)	0.022
Transactional Sex						
Never Incarcerated (N = 122) 5%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 6%	1.27 (.49-3.39)	0.65	1.68 (.60-4.71)	0.32	1.18 (.39-3.57)	0.77
Released 1-6 months ago (N = 75) 32%	8.94 (3.45-23.2)	<0.001	11.30 (4.05-31.5)	<0.001	10.53 (3.67-30.18)	<0.001

a Odds ratio.
b 95% confidence interval.
c Adjusted for age, high school diploma or equivalent, and history of psychopathology

Table 3–2. Continued

Risk Behavior; % Reporting Behavior	No Committed Partner		Committed partner		Committed partner	
	Adjusted OR[c] (CI[b])	*p*	Unadjusted OR[a] (CI[b])	*p*	Adjusted OR[c] (CI[b])	*p*
Smoked Crack Cocaine						
Never Incarcerated (N = 122) 28%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 35%	0.97 (0.52-1.80)	0.93	1.96 (.78-4.93)	0.07	1.74 (0.65-4.54)	0.35
Released 1-6 months ago (N = 75) 52%	2.55 (1.22-5.32)	<0.001	2.7 (.79-9.29)	0.09	2.56 (0.73-8.92)	0.14
Injection Drug Use						
Never Incarcerated (N = 122) 27%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 34%	1.08 (0.74-2.28)	0.83	.58 (.26-1.28)	0.65	0.71 (0.31-1.63)	0.41
Released 1-6 months ago (N = 75) 39%	2.66 (1.18-6.01)	0.02	1.05 (.34-3.20)	0.93	1.12 (0.35-3.60)	0.85
Transactional Sex						
Never Incarcerated (N = 122) 5%	Referent		Referent		Referent	
Released > 6 months ago (N = 255) 6%	1.45 (0.44-4.74)	0.54	2.00 (.23-17.19)	0.53	3.65 (0.39-34.65)	0.26
Released 1-6 months ago (N = 75) 32%	11.3 (3.65-34.9)	<0.001	3.89 (.33-45.82)	0.28	7.66 (0.54-102.1)	0.12

a Odds ratio.
b 95% confidence interval.
c Adjusted for age, high school diploma or equivalent, and history of psychopathology

CHAPTER 4
DISCUSSION

Consistent with previous research, this study highlights the months following release from incarceration as a high-risk period for drug use and sexual risk behaviors [11, 73-76]. Women in this sample released from incarceration 1-6 months ago were more likely to have engaged in illicit drug use and transactional sex than women who were never incarcerated or released more distally. Additionally, there was a trend towards significantly higher prevalence of binge drinking among those released within the past 6 months. In order to evaluate the incarceration as an independent risk factor for HIV-related drug use and sexual risk behaviors, potentially confounding variables were identified and controlled for. However in reality, mental illness and educational attainment have strong links to incarceration as well as to illicit drug use and sexual risk behaviors [19, 25, 77]. In contrast to prior work, this study did not find that Black women were more likely than other races to report an incarceration history [2, 3]. However, the majority of this sample identified as Black, which may have contributed to this lack of significant findings.

This elevated rates of drug use and transactional sex following release from incarceration appeared to diminish with time, as women with more distal exposure to incarceration reported past-month behavior patterns that did not differ significantly from women who were never incarcerated. Longitudinal studies of released jail inmates and prisoners have found a trend of reduced drug use and risk behaviors at one year post-release [36, 76, 78]. This trend may reflect a gradual shift towards successful reintegration and social stability with time. Further, emotional reactions to the stress of

reintegration may have eased, resulting in a greater ability for some women to resist drug use.

Community re-entry is a period characterized by instability and stressors that may trigger substance use and high-risk sexual behaviors. Former inmates often face unstable housing, homelessness and unemployment and may resort to drugs to cope with the emotional distress from a disrupted life [79, 80]. They may also engage in transactional sex to meet financial and material needs [81, 82]. Mental health and substance treatment needs often remain unaddressed, and women may continue to engage in transactional sex to provide for a drug dependency or due to untreated mental illness [77, 83, 84]. At the same time, many women experience a diminished social network as they reenter the community due to strained relationships with friends and family. Additionally women may attempt to form new social ties outside of the risky social networks that they may have belonged to prior to incarceration [41, 85].

Consistent and positive social support has been found to reduce many re-entry challenges. It has also been associated with less drug use and risky sexual behavior in the first six months following prison release among males [40]. Among males, those who resumed behaviors characteristic of those prior to their arrest, such as illicit drug use and multiple sex partners, were less likely to have a steady sexual partner than those who more successfully reintegrated.

In this sample, the moderating effect of a committed partner on recently released women's HIV risk behaviors was noteworthy. Among those with a committed partner, an increase in drug use was not observed in the first six months following release from incarceration. Women without a committed partner had a higher use prevalence of

crack cocaine smoking and injection drug use in the first six months. The low prevalence of transactional sex in the sample does not allow us to draw any conclusions about this behavior. Ten events per variable are recommended when performing logistic regression to prevent confidence intervals from exceeding 95% coverage [86]. Too few women reported transactional sex in this sample to meet the recommended number of events per variable. When examining the general pattern of results for transactional sex, recently-released women without a committed partner appeared more likely to engage in transactional sex, while a corresponding increase was not found among recently-released women that reported a partner.

All except one recently-released woman with a committed partner reported that her partnership was greater than six months in duration. Therefore, it is likely that partnered women released from incarceration within the past six months were in a relationship with their partner at the time of their release. The presence of a committed partner may have served as a source of emotional or instrumental support and protected against the stressors of re-entry that can lead to substance use and transactional sex. Partnered women may have perceived the availability of support from her partner regardless of whether or not support was offered or given; women who perceived available support may have viewed reentry challenges and her ability to cope with them in a more positive manner [42]. Alternatively, women with committed partners may have been less likely to engage in HIV-related risk behaviors than unpartnered women. However, past-month drug use did not differ significantly between women with and without committed partners in the overall sample, though there were significant differences in sexual risk behaviors in the overall sample based on partnership status.

Those with a partner were less likely to engage in transactional sex and condom use, though they were more likely to use alcohol or drugs before or during sex. These findings related to sexual risk behaviors are consistent with previous studies showing that some risky sexual behaviors, such as inconsistent condom use, may be more likely to occur in the context of a steady sexual partnership [87, 88].

Previous research suggests that a romantic partner provides an important source of social support for female inmates. Despite low support from friends and family, a significant portion of jail inmates report that a significant other provides emotional support and comfort [13]. Miller's Relational Model suggests that women's psychological health, sense of well-being, and ability to cope with adversity rely heavily on relationships [45]. While some suggest women may use drugs and engage in sexual risk taking to maintain connections, loneliness or an ended relationship can also trigger substance abuse to cope with strong feelings of distress [55,89-91]. This study did not obtain information on the partners' substance use patterns, the level of HIV risk that they posed to the women, or how much their habits affected the women's risk behaviors. However romantic partners, even substance-abusing partners, may provide critical support when friends or other family members pull away due to frustration or bitterness over a woman's ongoing substance problems and arrests [31]. In a study of former female inmates in drug treatment, 63% named a partner as a main source of support. Over half of the partners actually tried to help the women stop using, though 40% supported the woman while also enabling her drug use. The women described family and friends as much less likely to help them stop using [92]. In another study of former female inmates, negative partner influences were not significantly associated

with drug use [93]. The relationship complexities of female former inmates who abuse substances or engage in transactional sex are considerable. This represents an important area for research in order to situate interventions in the context of a woman's relationships [94].

It should be pointed out that this sample does not capture women who were re-arrested, and the reduced prevalence of risk behaviors observed among women released greater than six months ago may reflect those who avoided risk behaviors and more successfully reintegrated. Recent estimates suggest that one-third of female jail inmates are rearrested within a year of their release [36]. The HIV-risk behavior interview did not collect information on number of children. Children often exert a significant influence on women's decision to participate in drug treatment, and it will be important to better appreciate the influence of children on women's behavior after release from incarceration [24, 31]. Additional limitations include the cross-sectional nature of the data, limiting the ability to draw a causal connection between the presence of a committed partner and reduced drug use. This study did not verify self-reported incarceration, partner status or past-month drug use information. It is possible that recall bias or social desirability bias created inaccuracies in the data. Despite these limitations, the prevalence of risk behaviors and incarceration experiences were consistent with previously reported figures [61, 95, 96].

While acknowledging these limitations, the current study sheds light on women's patterns of drug and alcohol use and sexual risk behaviors after release and highlights the potential protective influence of a committed partner on drug use during the risky community re-entry period. With high rates of relationship dissolution during

incarceration, the potential protective influence of an intact relationship upon release is particularly noteworthy. Future studies should investigate the qualities of relationships that may help women resist substance use following release. Additionally, factors that allowed the relationship to remain intact should be explored.

LIST OF REFERENCES

1. Chen NE. Advances in the prevention of heterosexual transmission of HIV/AIDS among women in the United States. Infectious disease reports. 2011;3(1):e6.

2. Greenfeld L, Snell T. Bureau of Justice Statistics Special Report: Women Offenders. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics. 2000.

3. Snyder HN. Arrest in the United States, 1990-2012. Washington, DC: US Department of Justice, Bureau of Justice Statistics. 2012.

4. Hoffman JA, Klein H, Eber M, Crosby H. Frequency and intensity of crack use as predictors of women's involvement in HIV-related sexual risk behaviors. Drug Alcohol Depend. 2000;58(3):227-236.

5. Mathers BM, Degenhardt L, Phillips B, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. Lancet. 2008;372(9651):1733-1745.

6. Strathdee SA, Stockman JK. Epidemiology of HIV among injecting and non-injecting drug users: current trends and implications for interventions. Curr HIV/AIDS Rep. 2010;7(2):99-106.

7. Weller SC D-BK. Condom effectiveness in reducing heterosexual HIV transmission: Cochrane Database Syst Rev; 2002; Art. No.: CD003255.

8. Spaulding A, Stephenson B, Macalino G, Ruby W, Clarke JG, Flanigan TP. Human Immunodeficiency Virus in Correctional Facilities: A Review. Clin Infect Dis. 2002;35(3):305-312.

9. Mallik-Kane K VC. Health and prisoner reentry: How physical, mental, and substance abuse conditions shape the process of reintegration. Washington, DC: The Urban Institute; 2008.

10. D.C. AfaSD. Move along: Policing sex work in Washington, D.C.: A report by the Alliance for a Safe & Diverse D.C. Washington DC: Different Avenues; 2008.

11. Binswanger IA, Stern MF, Deyo RA, et al. Release from Prison — A High Risk of Death for Former Inmates. New Engl J Med. 2007;356(2):157-165.

12. Farrell M, Marsden J. Acute risk of drug-related death among newly released prisoners in England and Wales. Addiction. 2008;103(2):251-255.

13. Singer MI, Bussey J, Song LY, Lunghofer L. The psychosocial issues of women serving time in jail. Soc Work. 1995;40(1):103-113.

14. Jannetta J NS, Davies E, Horvath A. Transition from prison to community initiative: Process evaluation final report: Urban Institute Justice Policy Center; 2012.

15. Wilson AB. How people with serious mental illness seek help after leaving jail. Qual Health Res. 2013;23(12):1575-1590.

16. Proctor SL. Substance use disorder prevalence among female state prison inmates. Am J Drug Alcohol Abuse. 2012;38(4):278-85.

17. Taxman FS, Perdoni ML, Harrison LD. Drug treatment services for adult offenders: the state of the state. J Subst Abuse Treat. 2007;32(3):239-54.

18. Lynch SM, Fritch A, Heath NM. Looking beneath the surface: The nature of incarcerated women's experiences of interpersonal violence, treatment needs, and mental health. Fem Criminol. 2012;7(4):381-400.

19. Lynch SM DD, Belknap J, Green BJ. Women's pathways to jail: examining mental health, trauma, and substance use. Washington, D.C.: U.S. Department of Justice; 2013.

20. Green BL, Miranda J, Daroowalla A, Siddique J. Trauma exposure, mental health functioning, and program needs of women in jail. Crime Delinq. 2005;51(1):133-151.

21. Derkzen D, Booth L, Taylor K, McConnell A. Mental health needs of federal female offenders. Psychol Serv. 2013;10(1):24-36.

22. McLean RL TM. Repaying debts. New York: US Department of Justice, Bureau of Justice Assistance; 2007.

23. Warr M. Life-course transitions and desistance from crime. Criminology. 1998;36(2):183-216.

24. Covington S. A woman's journey home: challenges for female offenders and their children. From Prison to Home Conference. Bethesda, MD; 2002.

25. Harlow CW. Education and correctional populations: US Department of Justice, Bureau of Justice Statistics; 2003.

26. McCarty M, Aussenberg RA, Falk G, Carpenter DH. Drug testing and crime-related restrictions in TANF, SNAP, and housing assistance. Washington, DC: Congressional Research Service; 2012.

27. Bloom B OB, Covington S. Gender-responsive strategies: Research, practice and guiding principles for women offenders. Washington, D.C.: Department of Justice, National Institute of Corrections; 2003.

28. Koyanagi C. Arrested? What happens to your benefits if you go to jail or prison? Bazelon Center for Mental Health Law. Washington DC; 2006.

29. El-Bassel N, Gilbert L. Correlates of crack abuse among drug-using incarcerated women: Psychological trauma, social support, and coping behavior. Am J Drug Alcohol Abuse. 1996;22(1):41-56.

30. Glaze LE ML. Parents in prison and their minor children. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; 2008.

31. Harp KL, Oser C, Leukefeld C. Social support and crack/cocaine use among incarcerated mothers and nonmothers. Subst Use Misuse. 2012;47(6):686-694.

32. Belenko S, Langley S, Crimmins S, Chaple M. HIV risk behaviors, knowledge, and prevention education among offenders under community supervision: a hidden risk group. AIDS Educ Prev. 2004;16(4):367-385.

33. Binswanger IA, Nowels C, Corsi KF, et al. Return to drug use and overdose after release from prison: a qualitative study of risk and protective factors. Addict Sci Clin Pract. 2012;7(1):3.

34. Norton-Hawk MA. The counterproductivity of incarcerating female street prostitutes. Deviant Behav. 2001;22(5):403-417.

35. Dumont DM, Brockmann B, Dickman S, Alexander N, Rich JD. Public health and the epidemic of incarceration. Annu Rev Publ Health. 2012;33:325-339.

36. Freudenberg N. Jails, prisons, and the health of urban populations: a review of the impact of the correctional system on community health. J Urban Health. 2001;78(2):214-235.

37. Cohen S UL, Gottlieb B, ed. Social support measurement and interventions: A guide for health and social scientists. New York: Oxford; 2000.

38. Ohlin LE. The stability and validity of parole experience tables: Sociology, University of Chicago; 1954.

39. Laub JH, Nagin DS, Sampson RJ. Trajectories of change in criminal offending: Good marriages and the desistance process. Am Sociol Rev. 1998;63(2):225-238.

40. Seal DW, Eldrige GD, Kacanek D, Binson D, MacGowan RJ, Grp PSS. A longitudinal, qualitative analysis of the context of substance use and sexual behavior among 18-to 29-year-old men after their release from prison. Soc Sci Med. 2007; 65(11):2394–2406.

41. Parsons ML W-RC. Factors that support women's successful transition to the community following jail/prison. Health Care for Women International. 2002;23(1):6-18.

42. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull. 1985;98(2):310-357.

43. Thoits PA. Social support as coping assistance. J Consult Clin Psychol. 1986;54(4):416-423.

44. Belle D. Gender differences in the social moderators of stress. In: Barnett RC, Biener L, Baruch GK, ed. Gender and Stress. New York: Free Press; 1987:257-277.

45. Miller JB. Toward a new psychology of women. Boston, MA: Beacon Press; 1976.

46. Ptacek JT, Smith RE, Zanas J. Gender, appraisal, and coping - a longitudinal analysis. J Pers.1992;60(4):747-770.

47. Elliott M. Gender differences in causes of depression. Women Health. 2001;33(3-4):163-177.

48. Olstad R, Sexton H, Sogaard AJ. The Finnmark Study. A prospective population study of the social support buffer hypothesis, specific stressors and mental distress. Soc Psych Psych Epid. 2001;36(12):582-589.

49. Noar SM, Webb E, Van Stee S, et al. Sexual Partnerships, risk behaviors, and condom use among low-income heterosexual African Americans: A qualitative study. Arch Sex Behav. 2012;41(4):959-970.

50. Tortu S, Beardsley M, Deren S, Davis WR. The risk of HIV-infection in a national sample of women with injection drug-using partners. Am J Public Health. 1994;84(8):1243-1249.

51. Knudsen HK, Leukefeld C, Havens JR, et al. Partner relationships and HIV risk behaviors among women offenders. J Psychoactive Drugs. 2008;40(4):471-481.

52. Kenrick DT, Neuberg SL, Cialdini RB, ed. Social psychology: Goals in interaction. 5 ed. Boston, MA: Allyn & Bacon; 2010.

53. Finkelstein N. Using the relational model as a context for treating pregnant and parenting chemically dependent women. In B. Underhill & D. Finnegan (Eds.), Chemical dependency: Women at risk. New York: Harrington Park Press. 1996:23-44.

54. Covington S, Surrey J. The relational model of women's psychological development: Implications for substance abuse. In S. Wilsnack and R. Wilsnack (Eds.) Gender and alcohol: Individual and social perspectives. New Brunswick, NJ: Rutgers University Press. 1997:335-351.

55. Staton-Tindall M, Duvall JL, Leukefeld C, Oser CB. Health, mental health, substance use, and service utilization among rural and urban incarcerated women. Womens Health Iss. 2007;17(4):183-192.

56. Alarid LF, Burton VS, Cullen FT. Gender and crime among felony offenders: assessing the generality of social control and differential association theories. J Res Crime Delinq. 2000;37(2):171-99.

57. Griffin ML, Armstrong GS. The effect of local life circumstances on female probationers' offending. Justice Quarterly. 2003;20(2):213-239.

58. El-Bassel N, Gilbert L, Rajah V, Foleno A, Frye V. Fear and violence: Raising the HIV stakes. AIDS Educ Prev. 2000;12(2):154-170.

59. Western B. The impact of incarceration on wage mobility and inequality. Am Sociol Rev. 2002;67(4):526-546.

60. Fu JJ, Herme M, Wickersham JA, et al. Understanding the revolving door: individual and structural-level predictors of recidivism among individuals with HIV leaving jail. AIDS Behav. 2013;17 Suppl 2:S145-155.

61. Epperson MW, Khan MR, Miller DP, Perron BE, El-Bassel N, Gilbert L. Assessing criminal justice involvement as an indicator of human immunodeficiency virus risk among women in methadone treatment. J Subst Abuse Treat. 2010; 38(4):75-83.

62. Senn TE, Carey MP, Vanable PA, Coury-Doniger P, Urban M. Sexual partner concurrency among STI clinic patients with a steady partner: correlates and associations with condom use. Sex Transm Infect. 2009;85(5):343-347.

63. van Empelen P, Schaalma HP, Kok G, Jansen MW. Predicting condom use with casual and steady sex partners among drug users. Health Educ Res. 2001;16(3):293-305.

64. Davis KC, Masters NT, Eakins D, et al. Alcohol intoxication and condom use self-efficacy effects on women's condom use intentions. Addict Behav. 2014;39(1):153-158.

65. Weafer J, Fillmore MT. Comparison of alcohol impairment of behavioral and attentional inhibition. Drug Alcohol Depend. 2012;126(1-2):176-182.

66. National Institute of Alcohol Abuse and Alcoholism. NIAAA council approves definition of binge drinking. NIAAA Newsletter. 2004;3:3.

67. Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, Sexual Transmitted Diseases and Tuberculosis Prevention, Centers for Disease Control and Prevention. HIV and substance use in the United States. 2013.

68. Dehovitz JA, Kelly P, Feldman J, et al. Sexually-transmitted diseases, sexual-behavior, and cocaine use in inner-city women. Am J Epidemiol. 1994;140(12):1125-1134.

69. Lejuez CW, Bornovalova MA, Daughters SB, Curtin JJ. Differences in impulsivity and sexual risk behavior among inner-city crack/cocaine users and heroin users. Drug Alcohol Depend. 2005;77(2):169-175.

70. Baliunas D, Rehm J, Irving H, Shuper P. Alcohol consumption and risk of incident human immunodeficiency virus infection: a meta-analysis. Int J Public Health. 2010;55(3):159-166.

71. Zablotska IB, Gray RH, Serwadda D, et al. Alcohol use before sex and HIV acquisition: a longitudinal study in Rakai, Uganda. AIDS. 2006;20(8):1191-1196.

72. Younge SN, Salazar LF, Crosby RF, DiClemente RJ, Wingood GM, Rose E. Condom use at last sex as a proxy for other measures of condom use: is it good enough? Adolescence. 2008;43(172):927-931.

73. Khan MR, Wohl DA, Weir SS, et al. Incarceration and risky sexual partnerships in a southern US city. J Urban Health. 2008;85(1):100-113.

74. Morrow KM, Project SSG. HIV, STD, and hepatitis risk behaviors of young men before and after incarceration. AIDS Care. 2009;21(2):235-243.

75. Vlahov D, Putnam S. From corrections to communities as an HIV priority. J Urban Health. 2006;83(3):339-348.

76. Wilson ME, Kinlock TW, Gordon MS, O'Grady KE, Schwartz RP. Postprison release HIV-risk behaviors in a randomized trial of methadone treatment for prisoners. Am J Addict. 2012;21(5):476-487.

77. Graham N, Wish ED. Drug-Use among Female Arrestees - Onset, Patterns, and Relationships to Prostitution. J Drug Issues. 1994;24(1-2):315-329.

78. Adams L, Kendall S, Smith A, Quigley E, Stuewig J, Tangney J. HIV risk behaviors of male and female jail inmates prior to incarceration and one year post-release. AIDS Behav. 2013;17(8):2685-94.

79. McLean RL, Robarge J, Sherman SG. Release from jail: moment of crisis or window of opportunity for female detainees? J Urban Health. 2006;83(3):382-393.

80. Richie BE. Challenges incarcerated women face as they return to their communities: Findings from life history interviews. Crime Delinquency. 2001;47(3):368-389.

81. German D, Latkin CA. Social stability and HIV risk behavior: evaluating the role of accumulated vulnerability. AIDS Behav. 2012;16(1):168-178.

82. Murphy LS. Determinants of behavior in women choosing to engage in street-level prostitution. Baltimore, MD; 2007.

83. Farley M, Kelly V. Prostitution: a critical review of the medical and social sciences literature. Women & Criminal Justice. 2000;11(4):29-64.

84. Logan TK, Leukefeld C. Sexual and drug use behaviors among female crack users: a multi-site sample. Drug Alcohol Depend. 2000;58(3):237-245.

85. Visher CA, Travis J. Transitions from prison to community: Understanding individual pathways. Annu Rev Sociol. 2003;29:89-113.

86. Peduzzi P, Concato J, Kemper E, Holford TR, Feinstein AR. A simulation study of the number of events per variable in logistic regression analysis. J Clin Epidemiol. 1996;49(12):1373-1379.

87. Bryant J, Brener L, Hull P, Treloar C. Needle sharing in regular sexual relationships: an examination of serodiscordance, drug using practices, and the gendered character of injecting. Drug Alcohol Depend. 2010;107(2-3):182-187.

88. Lescano CM, Vazquez EA, Brown LK, Litvin EB, Pugatch D, Project SSG. Condom use with "casual" and "main" partners: what's in a name? J Adolesc Health. 2006;39(3):443.e1-7.

89. Calhoun S, Messina N, Cartier J, Torres S. Implementing gender-responsive treatment for women in prison: Client and staff perspectives. Federal Probation. 2010;74:339-349.

90. Leukefeld C, Havens J, Tindall MS, et al. Risky relationships: targeting HIV prevention for women offenders. AIDS Educ Prev. 2012;24(4):339-349.

91. Tucker MB. Social support and coping: Applications for the study of female drug abuse. J Soc Issues. 1982;38(2):117-137.

92. Falkin GP, Strauss SM. Social supporters and drug use enablers: a dilemma for women in recovery. Addict Behav. 2003;28(1):141-155.

93. Staton-Tindall M, Frisman L, Lin HJ, Leukefeld C, Oser C, Havens JR, et al. Relationship influence and health risk behavior among re-entering women offenders. Womens Health Issues. 2011;21(3):230-238.

94. El-Bassel N, Wechsberg WM, Shaw SA. Dual HIV risk and vulnerabilities among women who use or inject drugs: no single prevention strategy is the answer. Curr Opin HIV AIDS. 2012;7(4):326-331.

95. Kuo I, Greenberg AE, Magnus M, Phillips G 2nd, Rawls A, Peterson J, et al. High prevalence of substance use among heterosexuals living in communities with high rates of AIDS and poverty in Washington, DC. Drug Alcohol Depend. 2011;117(2-3):139-144.

96. Staton-Tindall M, Leukefeld C, Palmer J, et al. Relationships and HIV risk among incarcerated women. The Prison Journal. 2007;87(1):143-165.

BIOGRAPHICAL SKETCH

Lauren Hearn graduated from Emory University in May 2009 with a Bachelor of Science degree in biology. Lauren is presently pursuing a doctoral degree in clinical and health psychology at the University of Florida. Her academic interests include understanding the unique factors contributing to disparities in the prevalence, diagnosis and treatment of HIV/AIDS, hepatitis C and sexually-transmitted infections among underserved populations.