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Relationship influence and health risk behavior among re-entering women offenders

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Abstract

Background—Studies have shown that relationships can influence health risk behaviors such as drug use among women offenders. This study takes an exploratory look at the positive and negative influences of parents, peers, and partners for women prisoners to better understand their health risk behavior for HIV, including risky sex and drug use.

Methods—The current study includes secondary analysis of cross-sectional data from women offenders enrolled in three protocols of the National Institute on Drug Abuse (NIDA) funded Criminal Justice Drug Abuse Treatment Studies (CJDATS) cooperative agreement. Baseline interviews were completed with incarcerated women preparing for community re-entry and focused on behaviors during the 6 months prior to incarceration. Relationship influences during the 6 months before prison were categorized as “positive” or “negative” for the women offenders.

Findings—Multivariate regression models suggested that positive parental influence was significantly associated with reduced HIV risk and reduced drug use in the 6 months prior to incarceration. However, negative peer influence increased drug use including both risky needle behavior and any drug use in the 6 months prior to incarceration.

Conclusions—These data suggest that, while relationships are generally important to women, particular types of relationship influences may be related to risky behavior. Implications for targeting re-entry interventions for women offenders are discussed.

Introduction

While some research has focused on women offenders’ partner relationships and HIV risk (i.e., Knudsen et al., 2008), other key sources of support (family and/or friends) may have enabled their drug use and other health risk behaviors prior to entering prison (Falkin & Strauss, 2003). Understanding the association between women’s pre-incarceration health risk behaviors and the nature of their relationships is the focus of the current study. This study takes an exploratory look at the positive and negative pre-incarceration influences of parents, peers, and partners for women prisoners to better understand their risky sexual activity and drug use.

Importance of relationships for women

Relationships and connectedness are seen as uniquely important to the psychological development of women. Early theoretical work by Miller (1976) and Gilligan (1982) suggested that a woman’s identity and “sense of self” is defined within the context of her relationships, and this sense of identity shapes a woman’s role and responsibility within a social network. It is therefore not surprising that relationships have been shown to play an important role in influencing women’s behavior. For example, the Relational Model suggests that “disconnections” or conflicts in relationships with parents, family, peers, and communities lead to a sense of isolation, anxiety, and pain, which may be relieved by drug and alcohol use (Finkelstein, 1993; Covington & Surrey, 1997). The search for relational connection may lead women to experiment with substance use in order to affiliate with a social network (Finkelstein, 1993), which if negative, may also facilitate initiation of other types of deviant activities (Covington & Surrey, 1997). The partner relationship may be especially important as an avenue for women’s substance use (Staton-Tindall, et al., 2007b). Thus, these studies suggest that there is an association between women’s relationships (positive and negative) and their risky behaviors.

Types of relationship influences

While the previously noted theoretical work suggests that relationships influence women's behavior, less is known about the effect of specific *types* of relationships. Developmental theories have attempted to explain how the lack of close parental relationships contributes to problem behavior among young adults. Early theoretical work by Jessor and Jessor (1977) indicated that "... the more a supportive relationship with parents is perceived, the less the problem behavior" (pg. 116). Jessor et al. (1995) also reported that protective factors, defined as the "perceived environment system" that includes positive relationships with adults, perceived regulatory controls, and peer models of conventional behavior moderated the effects of risks for problem behaviors.

Hawkins, Catalano, and Miller (1992) also proposed a theory of risk and protective factors, including relationships, for initiating alcohol and other drug use during the critical developmental stages of adolescence and young adulthood. This theory highlighted factors such as low parental bonding and a lack of closeness in parent-child relationships as part of an index of risk factors for substance use and problem behaviors (Hawkins, Catalano, & Miller, 1992). Conclusions with relevance to the current study were that positive support systems, especially parents and peers, are protective for becoming involved in risky behaviors like alcohol and drug use.

While these theories suggest risk and protective qualities of relationships among adolescents and young adults, much less is known about the influence of relationships among adult women, despite the theoretical importance. Relationship influences have been noted as critical for understanding women's substance abuse with respect to initiation, continued use, recovery, and relapse (Henderson, 1998). Research has not focused on how perceived positive and negative adult relationships with parents, peers, and partners may also influence other health risk behaviors among adult women, including risky sexual activity.

Female prisoners and risk for HIV

Female prisoners represent an at-risk group of women who have endured a number of relationship challenges (Staton-Tindall et al., 2007b), are at high risk for drug use, abuse, and dependence (Henderson, 1998), and are at increased risk for the development of HIV and other serious health consequences of risky sexual activity (Harrison & Beck, 2005). HIV and other STIs present serious health concerns for women offenders with a history of substance use who are re-entering the community from prison because HIV is increasingly prevalent among incarcerated women when compared to incarcerated men (Harrison & Beck, 2005). In fact, at year-end 2003, 2.8% of female prisoners were HIV positive compared to 1.9% of male inmates (Harrison & Beck, 2005). Another study reported that the rate of HIV infection is about fifteen times higher among women offenders than among women in the general U.S. population (De Groot & Cu Uvin, 2005). Early research in the 1990s indicates that the increased rate of HIV among women offenders has been attributed to exchanging sex for money or drugs, sharing drug injection equipment, engaging in unprotected sex with drug-injecting partners, having sex with multiple partners, having a history of a diagnosed STI, using condoms inconsistently with multiple sex partners, and using alcohol and other non-injection drugs (Cotton-Oldenburg et al., 1997; Cotton-Oldenburg, et al., 1999; Hankins et al., 1994).

Given these factors and the serious health consequences of HIV and other STIs, a better understanding of relationship factors associated with risky sexual behaviors among incarcerated women is important for researchers and practitioners for the development of gender-specific assessment tools and HIV prevention interventions at community re-entry. The idea that partner relationships influence women's risky sexual behavior has received

some recent attention in the scientific literature (i.e., Knudsen, et al., 2008; Staton-Tindall, et al., 2007b). Early studies on attitudes toward condom use, negotiating condom use, and behavior change have been related to intimate partner relationships date back to the early 1990s (Schilling, El-Bassel, Gilbert, & Schinke, 1991; Schilling, El-Bassel, Gilbert, & Glassman, 1993). These early studies showed that women in committed relationships are less likely to use protection during sexual activity compared to single, non-committed women (Morrill, et al., 1996; Schilling, El-Bassel, Gilbert, & Schinke, 1991; Schilling et al., 1993). One study demonstrated that a high percentage of women were still willing to have sex if their main partners refused to wear a condom (Schilling, El-Bassel, Gilbert, & Schinke, 1991). More recent research has attempted to further understand women's risk behavior in the context of a relationship by examining perceived power within the relationship (Knudsen, et al., 2008; Billy, Grady, & Sill, 2009). These findings indicate that the context of a monogamous, committed relationship can shape a woman's thinking regarding risky sexual behavior since the woman "feels safe" with her partner, and subsequently, unprotected sex may be a sign of trust that enhances a relationship, especially if she does not perceive to have a great deal of power in the relationship. While partner relationships have been clearly linked to HIV risk behavior, research on the influence of other individuals (such as peers or parents) on risky drug use sexual activity is limited.

Current study

This study takes an exploratory look at the positive and negative influences of parents, peers, and partners on health risk behavior among adult women offenders. The theoretical literature and recent empirical studies suggest that positive relationships are protective for engaging in substance use and other health risk behaviors. However, less research has focused on the extent to which negative relationships may moderate the protective effects of positive relationships on different types of risk behaviors among this population. Also, while some research has focused on partner relationships and HIV risk among women offenders (i.e., Knudsen et al., 2008), other key sources of support for these women (family and/or friends) who may have enabled their drug use and other health risk behaviors prior to entering prison (Faulkin & Strauss, 2003) have been less researched. A focus on relationships before incarceration is critical because this time period was likely characterized by a chaotic lifestyle associated with risky drug use and other health risk behaviors including unprotected sexual activity. Therefore, this study has two primary objectives: (1) To explore the association between positive and negative pre-incarceration relationship influences of partner, parents, friends, and health risk behaviors among women offenders, and (2) To examine the extent to which negative pre-incarceration relationship influences moderate the effect of positive relationship influences on health risk behaviors for women offenders. It is expected that positive influences from parents and peers before prison will be associated with reduced health risk behaviors, and will therefore be inversely correlated with drug use and risky sex. It is also expected that positive pre-incarceration partner influences will be associated with increased security and comfort in relationships, and therefore significantly inversely correlated with HIV risk behaviors before prison. Finally, it is expected that the effect of positive relationship influences on risk behaviors will be weakened by the presence of more negative relationship influences.

Method

Study design and sample

The study includes secondary data analysis of cross-sectional data from substance-using women offenders enrolled in three protocols of the National Institute on Drug Abuse (NIDA) funded Criminal Justice Drug Abuse Treatment Studies (CJDATS) cooperative agreement. Female participants (N=366) from the following CJDATS protocols were

included in this analysis: 1) the Restructuring Risky Relationships (RRR) study (Havens, et al., 2009; Leukefeld & Staton-Tindall, 2005; Staton-Tindall et al., 2007b), (n=205); 2) the Transitional Case Management (TCM) study (Prendergast & Cartier, 2008), (n=110); and 3) the HIV/Hep C Prevention (HIV) study (Inciardi & Martin, 2007) (n=51). For more detailed descriptions of these studies, see www.cjdats.org.

This study was focused on the association between risky behaviors (including drug use) and relationships. Therefore, to be included in this study, participants had to have scored 3 or higher on the Texas Christian University (TCU) drug screen score (Knight, Simpson, & Hiller, 2002). On this scale, a score of 3 or higher on this scale indicates heavy drug use and at-risk for substance dependence. Literature on drug use and HIV risk behavior for the past two decades has indicated a strong link between increased drug use and risky sexual activity (i.e., Cotton-Oldenburg, Jordan, Martin, & Kupper, 1999; Staton-Tindall et al., 2007b), so this measure was incorporated into the study in order to recruit drug users who were at highest risk. Also, because this study is limited to considering the impact of different types of relationships (with respect to relationship categories as well as the positive or negative influence involved), only participants who provided information in all three relationship categories of partners, parents, and peers were included in the analysis.

Permission to use data from each protocol was granted by each Lead Center Principal Investigator and each study was approved by the Institutional Review Board (IRB) at each participating Research Center. In each study, baseline interviews were completed with women offenders within 6 months of their scheduled release date to the community. Data for this analysis were provided by 7 CJDATS Research Centers (Central States Research Center, Pacific Coast Research Center, Connecticut Research Center, Mid-Atlantic Research Center, Rhode Island Research Center, Rocky Mountain Research Center, Coordinating Center/VCU).

Measures

All study measures were based on participant self-report data collected through face-to-face interviews with trained research assistants using a common set of core instruments. The independent variables in this analysis include perceived positive and negative relationship influences of parents, peers, and partners during the 6 months prior to incarceration. Dependent variables included HIV risk behavior including needle use and risky sexual activity, and drug use during the 6 months prior to incarceration.

Relationship influences—Participants were asked to rate their perceptions of relationship influences as positive or negative based on conflict, mutual activities, and levels of involvement during the 6 months prior to incarceration using measures from the Texas Christian University Family and Friends Assessment (Broome et al., 2002). Scale item responses included a 5-point Likert scale, ranging from never to always (0=never, 1=rarely, 2=sometimes, 3=often, 4=always). The instrument measured eight types of relationship influences: (1) positive parents, (2) positive peers, (3) positive partners, (4) negative parents, (5) negative peers, and (6) negative partners, (7) substance use with partners, and (8) substance use with parents. Cronbach's alpha for the subscales ranged from 0.66 to 0.83, suggesting good to excellent reliability (see Table 2).

Positive relationship influences of partners (based on relationships with an intimate partner during the 6 months prior to incarceration) and parents were defined by four items: (1) "got along together", (2) "enjoyed being together", (3) "serious talks about each other's interests and needs", and (4) "help with each other's problems". Positive relationship influences of peers (defined as friends, roommates or the people that the participant spent a great deal of time during the 6 months prior to incarceration) were constructed by the following four

items: (1) “worked regularly”, (2) “felt hopeful for future”, (3) “spent time with families”, and (4) “liked being with families”.

Negative relationship influences of partners based on relationships with an intimate partner during the 6 months prior to incarceration) and parents each include three items: (1) “got blamed or fussed for things you didn’t do”, (2) “had disagreements”, and (3) “had big arguments or fights”. Negative relationship influences of peers (defined as friends, roommates or the people that the participant spent a great deal of time during the 6 months prior to incarceration) were defined by following seven items: (1) “got into fights”, (2) “got drunk”, (3) “used drugs”, (4) “dealt drugs”, (5) “did illegal things”, (6) “involved with gangs”, and (7) “got arrested”.

Using substances together were included as separate relationship influences following the initial exploratory factor analysis. In many cases, using substances together, especially with parents and partners, was viewed by respondents in a way that it correlated strongly with positive relationship influences. Therefore, the following three items were used to categorize use patterns with parents and partners: (1) “drank alcohol”, (2) “got drunk”, and (3) “used drugs together”.

HIV risk behavior—Three composite variables were derived from the Texas Christian University AIDS Risk Assessment (ARA) (Simpson, 1997), which is a 30-item instrument that assesses drug use and sexual risk behaviors in the last 30 days prior to incarceration. The ARA has demonstrated adequate reliability and validity (Simpson 1997). Three composite variables were computed for this analysis based on the literature on HIV risk behaviors (Simpson, 1997) and exploratory factor analysis using this assessment as a part of the CJDATS core instrument (Frisman, Prendergast, Lin, Rodis, & Greenwell, 2008). The three variables included: (1) general HIV/AIDS risk, (2) risky needle use, and (3) risky sexual behaviors.

The *general HIV/AIDS risk* composite variable is the summary score of: 1) any injection drug use (IDU), 2) any use of dirty drug works (including cottons, cookers, and/or rinse water), 3) engaging in sex with multiple sex partners, and 4) unprotected sex without condoms. This composite variable has a range from 0 to 4, with 0 reflecting no engagement in HIV/AIDS risk behaviors and 4 reflecting engagement in all four types of behaviors.

Similarly, the *needle use* composite variable is a summary score for any of the following behaviors: 1) ever injected a drug with a needle, 2) any sharing of needles, cookers, cotton, or water for drug injection, and 3) any injection drug use in the past 30 days. Scores range from 0 to 3, with 0 reflecting no engagement in any of the risky needle use behaviors and 3 reflecting engagement in all three types of risky needle use behaviors. However, since only 20.8% of participants reported engaging in any risky needle behavior, and fewer than 13% of participants reported engaging in more than one type of risky needle behavior, this variable was categorized as a dichotomous measure of needle use (1 = used needles, 0 = did not use needles) for the outcome analyses.

The *risky sexual behavior* composite variable is the summary of: 1) any sex while under the influence of drugs; 2) any sex with IDU users; 3) any sex with strangers; 4) any sex with cocaine users; and 5) exchanging sex for drugs or money. Scores ranged from 0 to 5, with 0 reflecting no engagement in risky sexual behaviors and 5 reflecting involvement in all five types of risky sexual behaviors.

Drug use—Drug use in the 6 months prior to incarceration was defined by “any” versus “no” use of 17 different substances from the CJDATS core instrument including marijuana,

crack, powder cocaine, heroin, amphetamines, and barbiturates. A dichotomous variable (1=substance use, 0=no substance use) was computed based on participants' self-reported drug use in the past six month prior to the current incarceration.

Analytic Plan

To examine the first study objective, a series of analyses focused on whether positive or negative relationship influences of partner, parents, and peers were associated with risk behavior for women. First, a series of bivariate analyses were conducted to determine the association between relationship influences and risk behaviors. Depending on the distribution of the risk behaviors, either multivariate regression (continuous outcomes) or logistic regression (binary outcome) was used to evaluate the association between relationship influences and health risk behaviors. For each analysis, independent variables were entered hierarchically, with demographic variables entered first as step 1 to adjust for possible confounding effects. Relationship influence variables were entered as step 2, with stepwise selection method to take an exploratory approach to understanding which relationship types were significantly associated with the targeted risk behaviors.

To examine the second study objective, a series of analyses examined the extent to which negative relationship influences moderate the effect of positive relationship influences on risk behaviors for women offenders. Using the multivariate regression models established for objective 1, an interaction term was computed using the product terms of positive and its corresponding negative relationship type (centered at each predictor's mean) and entered as a third step in the model. Specifically, these analyses explore the potential moderating effect of negative types of relationship influences on risk behaviors. The interaction term examined whether the effect of a positive relationship influence on the target risk behavior was either strengthened by a lower degree of negative relationship influences, or weakened by a higher degree of negative relationship influences.

When multiple significance tests are employed, it is usually important to adjust the significance criterion (alpha level) to account for the possibility of an inflated Type I error (falsely concluding that a null relationship was an actual relationship). In this case, however, the analyses were considered exploratory and a Type II error (failure to detect an actual relationship) was considered a primary concern, so this adjustment was not undertaken.

Results

Demographics

Participants had a mean of 7.8 (SD=2.1, range from 3 to 12) on the Texas Christian University (TCU) drug screen score (Knight, Simpson, & Hiller, 2002). As shown in Table 1, participants' average age at baseline was 35.6 (SD=2.4, ranging from 18.5 to 61.6), most (60.1%) were white, 38.3% were employed (full or part-time), and 13.3% were married (legally married or living as married couples). Participants had an average of 11 years of education.

Positive and negative relationships

Two indices for multicollinearity, tolerance, and variance inflation factors (VIF) were examined, and showed that the tolerance scores for predictor variables ranged from 0.79 to 0.96, and VIF scores ranged from 1.04 to 1.26, all within acceptable ranges (higher than 0.2 for tolerance and less than 4 for VIF, Manfield & Helms, 1982).

The means and standard deviations for the major study variables are presented in Table 2. Results from the bivariate analyses (see Table 3) indicate that a higher score for positive

parental influence is associated with less general HIV risk behavior and drug use in the 6 months prior to incarceration. Findings also indicate that higher scores on positive peer influence are negatively correlated with any drug use in 6 months prior to incarceration. Conversely, higher scores on negative peer influence are positively related to any drug use in the 6 months prior to incarceration

Multivariate hierarchical regression models (see Table 4) adjusting for demographic variables indicated that positive parental influence was associated with lower scores on general HIV risk ($b=-0.10$, $p=0.045$) and with less likelihood of engaging in drug use in the 6 months prior to incarceration (Adjusted Odds Ratio [AOR] = 0.52, 95% CI=0.33 – 0.83, $p=0.006$). In addition, findings from the multivariate model show that negative peer influence increases the likelihood of drug use (for binary HIV risky needle behavior, AOR=1.37, 95% CI = 1.03 – 1.83, $p=0.033$; for any drug use in the 6 months prior to incarceration, AOR=1.82, 95% CI = 1.13 – 2.94, $p=0.013$).

Negative relationship influence as a moderator

In order to examine the extent to which positive or negative relationship influences are associated with risk behavior within relationship type, the moderating effect of negative relationship influences were further examined. Based on findings from the multivariate analyses, only parenting and peer relationships emerged as significant correlates of risk behaviors and were therefore included in the moderator analysis. Two interaction terms were computed and added to the third step of hierarchical regression: (1) positive parental influence negative parental influence and (2) positive peer influence \times negative peer influence. There were no significant moderating effects of negative peer or parent influences on the association between positive peers and HIV risk behaviors or drug use.

Discussion

The purpose of this study was to examine the positive and negative pre-incarceration influences of parents, peers, and partners on women offenders' health risk behaviors. Relational theories and recent empirical studies suggest that positive relationships are protective for engaging in drug use and other health risk behaviors. Less research has focused on the extent to which negative relationships may moderate the protective effects of positive relationships on women's health risk behaviors. Therefore, this study had two primary objectives: (1) To explore the association between positive and negative relationship influences of partner, parents, friends, and risk behaviors among women offenders, and (2) To examine the extent to which negative relationship influences moderate the effect of positive relationship influences on women offenders' risk behaviors.

It was expected that positive influences from parents and peers would be protective against engagement in risk behaviors. This hypothesis was exploratory because the majority of studies on the relationship between parent and peer influences and risky sexual behaviors have focused on adolescents (e.g., Bachman, et al., 1997; Kandel, et al., 1986; Jessor & Jessor, 1977). This hypothesis was supported with higher scores for positive parental influence significantly associated with a decreased likelihood of using drugs in the past 6 months. While the parental influence construct has not been widely investigated, this finding is consistent with the literature which suggests that perceived positive social support is associated with less severe drug use, even among substance users (El Bassel, et al., 1996; Farrell, 2000; Staton Tindall, et al., 2007a).

This finding for positive parental influence on reduced engagement in risk behaviors was further supported by higher scores for positive parental influence being significantly associated with participation in fewer general HIV risk behaviors. This finding makes a

contribution to the literature because the association between parental influence and risky sexual behavior has not been widely examined for adults. It is consistent, however, with other studies that reported the association between positive parent relationships and reduced adolescent sexual activity (e.g., Coley, Votruba-Drzal, & Schindler, 2009; DiClemente, et al., 2008), and the importance of parental influence in youth safe sex decision-making (LaSala, 2007). Consequently, the theoretical assumptions about the importance of positive parental influence as a protective factor for adolescent and young adult problem behaviors may continue into adulthood, especially for women.

The positive peer influence hypothesis was also supported for drug use. Specifically, a higher score on positive peer influence was negatively correlated with drug use in past 6 months. Further, the higher score on negative peer influence was positively related to any drug use in the past 6 months. This finding is consistent with Staton-Tindall et al. (2008) who reported that the likelihood of more prosocial behavior (especially employment and consistent work) among women offenders was associated with a more positive peer group. Findings from this study suggest that the ways in which women perceive their peer groups and close and casual friendships prior to incarceration may be important in understanding the potential influence of those relations on women's drug use as they transition to the community.

Another study hypothesis was that the effect of positive relationship influences on risk behaviors would be decreased by the presence of more negative relationship influences. This hypothesis was not supported for the parent nor peer group. The lack of a significant moderating effect suggests that the inverse relationship between positive parental/peer influences and risk behaviors remains constant, even if more negative relationship influences are also present. This finding suggests the importance of positive relationships with parents and peers as protective for engaging in risk behaviors, and extends previous work with adolescents to illustrate the possible sustained impact of this relationship into adulthood – even among a high-risk sample of women substance users with a criminal justice involvement.

One study finding that is more difficult to explain is that partner relationships – positive or negative – did not emerge as a significant indicator of health risk behavior. This finding was particularly surprising since other studies have reported that relationships are associated with risky sexual activity (Morrell, et al., 1996; Staton-Tindall, et al., 2007b). The lack of a significant finding may be related to the measurement used in this study to tap the way that women perceive positive or negative partner influences and behaviors. For example, measures on drinking and using drugs with partners in this study correlated positively with other types of perceived positive behaviors with partners. Consequently, while women may view the influence of their partners as positive, they may be engaging in risky drug use behaviors with their partners that increase their health risks. This is consistent with Strauss and Falkin (2003) who reported overlap between partners who provided support but also enabled women's drug use. This is an important area for future research with measures that address positive and negative influences of relationships with an emphasis on feelings, attitudes, and behaviors between women and their partners.

This study has limitations that should be considered in interpreting findings. This is an exploratory study, using secondary data collected in the context of multi-site studies with common instrumentation. Because of the exploratory nature of this analysis, we had greater concern with committing Type II error, and may have an inflated Type I error because of the multiple comparison. Also, the use of cross-sectional data precludes making causal interpretations, and is subject to limitations related to temporal ordering of events that may influence women's responses, particularly related to contacts with family and friends. The

cross-sectional design is limited in fully assessing the complexities of relationships and support networks, as potentially evidenced in these findings by the low to moderate bivariate correlation effect sizes. Although a longitudinal design could also allow for further examination of the complexities of these relationships over time based on reporting of interactions with family and friends, as well as engaging in risk behaviors over time, this study is among the first to take an exploratory look at the positive and negative influences of relationships on engagement in HIV risk behaviors.

Another study limitation is the self-reported relationships with parents, partners, and peers, as well as risk behaviors before entering prison. While this approach has been used in other studies, reliance on self-reported data has limitations for incarcerated women, particularly on relationship issues. Participants in this study were asked to recall events before incarceration. Self-reported data limitations may be related to memory recall due to lifestyles during the targeted period before incarceration and to the time lapse between when they were incarcerated and the study interview. In addition, changing relationships with individuals targeted in the measures during this critical time period of incarceration may have also influenced retrospective accounts of relationships. This potential bias should be examined in future research. Also, despite efforts to assure that confidentiality was strictly maintained, participants may have been reluctant to report past illegal activities and substance use behaviors. However, recognizing these limitations, it has been found that self-reported data, even among drug users, is a reliable and valid measure of actual behaviors (Darke, 1998; Kokkevi, et al., 1997).

Another limitation is that a number of participants in this study may have had children. While parenting status was not examined as a study variable, we do recognize the potential of children as having an influence on their mothers' social support and related behaviors (Tracy & Martin, 2007). Future research should include children as a relationship factor, and perhaps consider examining differences in risky behavior among women offenders with children compared to those without children. Finally, this study was primarily focused on the association between risky behaviors and relationships, so type of current offense was not considered in the analysis. Additional research may examine the extent to which these variables may be mediated or moderated by different type of criminal offenses.

Despite these limitations, study findings from three protocols as part of a national cooperative contribute to the existing literature on health risk behaviors among women. This study targets a very specific group of women in prison. While this may limit generalizability to the larger population of women, this study provides one of the first exploratory examinations of relationship influences and health risk behavior among a sample who could be considered at high risk. While the adolescent and developmental literature is replete with studies on the association between parental/peer influences and risk behaviors, the adult literature on women has not focused on this area.

Because this study addresses issues critical to women's health and risk behaviors, these findings may have particular relevance for practitioners involved in the assessment and treatment planning as women offenders transition from prison to the community. These findings are important because many women return to social environments with parents, partners, and peers that could contribute to their drug use and subsequent health risks. In other words, while a woman may define these individuals as her social network and rely on them for primary support, these individuals may also increase the woman's risk for relapse, her risky health behaviors, and potentially, her risk for recidivism. Findings from this study suggest that practitioners should consider detailed and individualized assessments on supportive and risky relationships with women offenders as they enter correctional facilities,

as well as addressing the potential influence of those relationships into the community transition treatment plan.

In addition, previous studies have suggested the development and use of targeted interventions for women offenders that focus on relationships with partners (Staton-Tindall, et al., 2007b; Havens, et al., 2009) and families (Poehlmann, While, & Bjerke, 2004) in order to reduce HIV risk behavior. Therefore, these findings have important public health implications to target risky relationships among at-risk, vulnerable women in order to reduce risk behavior. Specifically, the importance of relationships to reduce health risk behaviors should be further examined through both qualitative studies and longitudinal quantitative studies to understand the context of relationships and factors associated with risky behaviors in order to promote reduction in those behaviors. In addition, research should consider studies that target a better understanding of women's relationships from the perspectives of their family, partners, and peers to which they will return following prison release. These studies should help to inform the development of other re-entry planning interventions for women offenders with a targeted and individualized focus on relationships with family and friends that may be protective for women as they transition to the community.

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Table 1

Characteristics of Participants (N=366).

	M or N	SD or %	Range
Age	34.18	8.66	(18.49 – 61.63)
Race			
White (non-Hispanic)	219	59.8%	
Black (non-Hispanic)	99	27.0%	
Hispanic	28	7.7%	
Other	20	5.5%	
Education (in years)	11.22	2.09	(1–19)
HS or GED	159	43.4%	
Married	48	13.1%	
Employed	151	41.3%	
# children under 18	2.18	1.45	(0–9)
Living with spouse/partner	224	61.2%	
# of arrests (lifetime)	14.51	19.28	(1–126)
# time arrested while using/getting drugs	11.25	16.77	(0–126)
% of drug related arrests (lifetime)			
# of arrests (past 6 month)	1.52	1.44	(0–12)
# of arrests (past 30 days)	1	0.40	(0–5)
# of drug related arrests (past 6 month)			
% of drug related arrests (past 6 month)			
Months in jail (current conviction)	14.35	18.23	(1–216)
# of time in jail (past 6 month)	0.67	1.13	(0–10)
# months in Jail Past 6 Mos	0.53	1.12	(0–5.93)
Ever hospitalized for mental health problem	116	31.7	

Table 2

Means and standard deviations of study variables (N=366)

	Mean (n)	SD (%)	Min	Max	Alpha	# of items
Relationship types						
Positive partner	2.31	1.06	0	4	0.70	4
Negative partner	2.26	1.19	0	4	0.79	3
Substance-using partner	1.65	1.16	0	4	0.66	3
Positive parents	2.21	1.12	0	4	0.75	4
Negative parents	2.03	1.15	0	4	0.78	3
Substance-using parents	0.99	0.80	0	4	0.83	3
Positive peers	2.05	0.98	0	4	0.75	4
Negative peers	1.98	0.99	0	4	0.80	7
Risk behaviors (past 30 days)						
HIV general risky behaviors	1.49	0.94	0	4	--	--
HIV risky needle behavior (binary)	74	20.2%	0	1	--	--
HIV risky sexual behaviors	1.95	1.50	0	5	--	--
Any drug use in past 6 months	342	93.4%	0	1	--	--

Table 3

Zero order correlation: relationship types and risk behaviors (N=366)

	HIV risk behaviors	HIV risky needle behavior (binary)	HIV risky sexual behaviors	Drug Use
Background variables				
Employed	-.10*	-.06	-.16**	-.07
Age	-.04	.01	-.07	-.10
Education	-.07	.01	-.16**	-.07
Married	.02	.02	-.04	.00
White	.14**	.23**	.09	.08
# of children under 18	.08	-.00	.06	-.02
# month in jail (past 6 month)	.05	-.03	.08	-.14*
# arrests lifetime	0.12*	0.12*	0.14**	0.10*
Ever hospitalized for MH problem	0.13*	0.04	0.12*	0.04
Social relationship				
Positive partner	-.04	-.08	.06	-.04
Negative partner	.02	.02	.03	-.02
Substance-using partner	.01	.05	.05	.01
Positive parents	-.11*	-.02	-.08	-.13*
Negative parents	.01	.00	.02	.01
Substance-using parents	.06	-.03	.06	.04
Positive peers	-.08	-.06	-.08	-.13*
Negative peers	.01	.09	-.02	.10*

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 4

Results of multivariate regression analyses (N=366)

	HIV risk (general)			HIV risky needle ^d			HIV risky sexual			Drug use ^d		
	b	se	OR	b	se	OR	b	se	OR	b	se	OR
Step 1												
Employed	-0.10	0.10		-0.17	0.29	0.84	-0.35*	0.16		-0.32	0.47	0.73
Age	0.00	0.01		0.01	0.02	1.01	-0.01	0.01		-0.05	0.03	0.95
Education	-0.02	0.02		0.02	0.07	1.02	-0.08*	0.04		-0.01	0.12	0.99
Married	0.03	0.14		0.22	0.39	1.24	-0.21	0.23		0.15	0.70	1.16
White	0.29**	0.10		1.44**	0.34	4.23	0.26	0.16		0.56	0.47	1.76
Time in jail	0.05	0.04		-0.06	0.14	0.94	0.09	0.07		-	0.15	0.62
										0.47**		
# arrests (life time)	0.01	0.00		0.01*	0.01	1.01	0.01	0.00		0.10*	0.04	1.11
Ever hospitalized for MH	0.21	0.10		0.11	0.29	1.11	0.31	0.17		-0.11	0.53	0.90
Step 2^b												
Positive												
Partner	-	-		-	-	-	-	-		-	-	-
Parents	-	.10*		-	-	-	-	-		-.65**	.24	.52
Peers	-	-		-	-	-	-	-		-	-	-
Negative												
partner	-	-		-	-	-	-	-		-	-	-
parents	-	-		-	-	-	-	-		-	-	-
peers	-	.32*		.15	1.37	-	-	-		.60*	.24	1.82
Substance use												
partner	-	-		-	-	-	-	-		-	-	-
parents	-	-		-	-	-	-	-		-	-	-

	HIV risk (general)	HIV risky needle ^d	HIV risky sexual	Drug use ^d
Model fits statistics				
R ² (ΔR^2)	0.07* (0.02*)		0.08** (---)	
-2 log likelihood		333.53**		140.84**

* significant at the 0.05 level (2-tailed).

** significant at the 0.01 level (2-tailed).

^dBecause HIV needle risk and drug use are binary outcome variables, the -2 log likelihood statistics are presented to indicate the degree of model fit.

^bUsing a stepwise selection method, only variables that resulted in significant improvement in model fit were retained in the final model, and only coefficients for variables retained are presented in the table.

^cCoefficients presented in this table reflect the final step.