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MINIMIZING THE RISK OF PREGNANCY, SEXUALLY TRANSMITTED DISEASES, AND HIV AMONG INCARCERATED ADOLESCENT GIRLS:

Identifying Potential Points of Intervention

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Abstract

Delinquent girls are at elevated risk for unplanned pregnancy and sexually transmitted diseases when compared with non-delinquent peers. Participants—234 incarcerated female juveniles—completed demographic, individual, partner, peer, and family measures and were tested for sexually transmitted diseases. Disease rates were as follows: chlamydia (20%), gonorrhea (4%), and syphilis (1%). Stepwise multiple linear regression analysis assessed the relationship of the predictor variable sets with sexual risk. Demographic and individual variables had the strongest associations with risk. Peer, partner, or family variables did not account for significant additional variance. The results suggest that an intervention could be delivered during the window of opportunity during the girls' incarceration, changing their knowledge, attitudes, and skills that are implicated in risky sexual behavior before they are released back into the community.

Keywords

delinquent girls; risk for pregnancy; sexually transmitted diseases; HIV; intervention delivery

More than 40 years ago, Ball and Logan (1960) commented on the highly elevated risk of delinquent girls for unplanned pregnancies and sexually transmitted diseases (STDs) in comparison with that of their nondelinquent peers. This finding has consistently recurred over the intervening decades in studies of risk determinants that predict untoward consequences from sexual behavior in delinquent youth (e.g., Hipwell et al., 2002; Romero et al., 2007; St.

Lawrence, Crosby, & O'Bannon, 1999). Romero and colleagues (2007) found that more than 60% of delinquent girls were engaging in more than 10 risk behaviors at the time of their initial interview and that incarcerated females had even higher risk than did delinquent males. Recently, Belenko et al. (2008) described high rates of STDs among adolescent offenders entering a juvenile correctional facility. Despite consistent research findings indicating that delinquent girls are at the apex of risk for HIV, STDs, and unplanned pregnancies, no published descriptions of any interventions to assist young female offenders in lowering their risk could be located in the literature, and only one report was found regarding an intervention targeting incarcerated male adolescents (St. Lawrence, Crosby, Belcher, Yazdani, & Brasfield, 1999).

In the absence of any scientific literature on effective STD/HIV risk reduction interventions for delinquent girls, the literature on effective interventions for community-based samples of adolescents can be used as a starting point to guide the preparation of a risk reduction program for incarcerated girls. A number of evidence-based interventions for nondelinquent youth have been developed and evaluated (Coyle et al., 2001; DiClemente et al., 2004; Jemmott, Jemmott, & Fong, 1992, 1998; Li, Stanton, Feigelman, & Galbraith, 2002; St. Lawrence, Brasfield, Jefferson, Alleyne, & Shirley, 1995; Wingood et al., 2006). Meta-analyses of those effective programs yielded consistent crosscutting content and pedagogical components across effective programs conducted with different races and ethnicities (Ingram, Flannery, Elkavich, & Rotheram-Borus, 2008; Jemmott & Jemmott, 2000; Lyles et al., 2007; Sales, Milhausen, & DiClemente, 2006). In addition, many of these evidence-based interventions were developed and evaluated with African American samples, a foundation that is relevant for potential programs to be delivered to incarcerated youths, given that the population of girls in juvenile facilities in the United States is overwhelmingly African American (DiClemente et al., 2004; Jemmott et al., 1992, 1998; Li et al., 2002; St. Lawrence et al., 1995; Wingood et al., 2006). This consistency across populations suggests that prevention programs do not have to be tailored for each race or ethnicity.

However, there are indications that the social adjustment, or maladjustment, of different adolescent populations requires alterations in program components for the intervention to address the needs of youth who are socially, behaviorally, or emotionally impaired. When delinquent, homeless, drug-using, and community-based samples of youth were compared in one study, their risk profiles were shown to be highly discrepant, suggesting that some tailoring would be required for each sample to address its unique risk behaviors (St. Lawrence, Crosby, & O'Bannon, 1999). A later study with drug-dependent adolescents described extensive tailoring of an existing evidence-based program to adapt it to the needs of a more socially impaired sample of youths (St. Lawrence, Crosby, Brasfield, & O'Bannon, 2002).

Despite an extensive literature on the risk behaviors of delinquent girls, there is little guidance available for intervention development regarding the optimal timing or location for intervention delivery and whether interventions should be delivered at the individual, dyadic, peer, or family level. For these questions, the existing literature was less forthcoming.

First, with respect to the best choice of location for program delivery, there may be a window of opportunity during the time that youth offenders are incarcerated; yet, it may be preferable to wait until after their release, when they will have immediate real-world opportunities to put new knowledge and skills into place as they are learned. Delivering the intervention while housed in correctional facilities has the advantages of minimizing attrition, maintaining attendance at sessions, successfully delivering greater intervention dosage, and controlling for both the assessments and the intervention delivery. The disadvantages, as indicated above, are twofold: First, incarcerated girls will not have real-world opportunities to practice newly acquired skills between sessions; second, potential concerns exist regarding whether content acquired from an intervention delivered during their incarceration can be expected to generalize

from the institutional setting into their daily lives after they return to their homes. Extensive literature reviews of PubMed, PsycINFO, and Medline did not yield any guidance on these issues.

Furthermore, there are constraints in delivering an intervention within a correctional setting. For example, it is not feasible to include sex partners, peers, or parents into a program that takes place during incarceration, particularly when considering that youth offenders in many facilities often come from a dispersed geographical region.

A number of research studies have examined the associations of individual variables, partner characteristics, peer influences, and family influences with adolescents' sexual risk, although very few of these articles focused on delinquent youths. At the level of the individual adolescent, most of the existing evidence-based programs were delivered using an individual or small group format (Jemmott & Jemmott, 2000; Lyles et al., 2007).

Individual-level predictors of risky sexual behavior as identified in the literature include delinquency, curiosity, affection for the partner, substance use, poor academic performance, and childhood sexual abuse or victimization (e.g., Andrinopoulos, Kerrigan, & Ellen, 2006; Boyer & Fine, 2000; French & Dishion, 2003; Hingson, Jeeren, Winter, & Wechsler, 2003; Lammers, Ireland, Resnick, & Blum, 2000; Laumann, Gagnon, Michael, & Michaels, 1994; McBride, Paikoff, & Holmbeck, 2003; Romero et al., 2007).

The variables of partner influence, peer network, and family relationship inconsistently emerge as risk or protective factors in the literature (Andrinopoulos et al., 2006). Hence, it is unclear whether these influences need to be addressed in intervention implementation, much less how this might be accomplished within a correctional setting.

At the partner level, community-based adolescent girls who are involved with older partners tend to report coitus at an earlier age and are more likely to acquire STDs than are girls with same-age partners (Auerswald, Buth, Brown, Padian, & Ellen, 2006; Kaestle, Morisky, & Wiley, 2002; Kissinger, 2003). In addition, high self-esteem, optimism, the absence of sensation seeking, and deliberative decision making have positive relationships with sexual safety (Broaddus & Bryan, 2008). Pressure and sexual coercions from older dating partners are clearly push factors that lead to earlier sexual debut (Kuttler & LaGreca, 2004; Lammers et al., 2000). This suggests that inclusion of partners might strengthen intervention effects. However, the transiency of adolescents' relationships calls into question whether this would be a useful or even feasible strategy, when considering not only that such adolescents tend to define themselves as being in a "relationship" after a short duration—averaging 21 days—but that the pairings tend to be short-lived (Fortenberry, Harezlak, Katz, & Ott, 2002). Finally, there is some evidence in the literature indicating that partner characteristics are less important for a female adolescent than her knowledge, motivation, and skills to promote safer sex encounters (Manlove, Ryan, & Franzetta, 2007).

Peer networks that engage in antisocial behaviors are associated with early sexual debut and riskier sexual practices (French & Dishion, 2003; Romero et al., 2007). Being embedded in peer networks that are believed by the adolescent to be sexually active predicts earlier sexual debut, higher risk of pregnancy, and acquisition of sexually transmitted infections (Bachanas et al., 2002; Dilorio, McCarty, Denzmore, & Landis, 2007; Kuttler & La Greca, 2004; Mosack, Gore-Felton, Chartier, & McGarvey, 2007). To date, there are no reports of interventions that enlist adolescent peer networks. This would be a cumbersome strategy for use with incarcerated youth, but given the strength of the associations in the existing literature, this might be an important consideration.

Finally, family conflict, lack of parental education, unstable living arrangements, low socioeconomic status, and frequent conflict with parents have all been associated with sexual risk in community-based samples of youth (cf. Hingson et al., 2003; Jeltova, Fish, & Revenson, 2005; McBride et al., 2003; Wight, Williamson, & Henderson, 2006; Yang et al., 2006). Conversely, perceived family support, parent communication, and parental monitoring are important protective factors (Dancy, Crittenden, & Talashek, 2006; Miller & Whitaker, 2000; Mosack et al., 2007). Comfort talking with parents about sexual behavior has been shown to have an inconsistent relationship to subsequent risky sexual behavior (Freedman, Salazar, Crosby, & DiClemente, 2005; Wight et al., 2006), and parents tend to underestimate their child's substance use and sexual involvement (Yang et al., 2006). However, there are promising examples of interventions that include parents in booster sessions or in out-of-session homework assignments (Dancy et al., 2006; Li et al., 2002).

In the absence of definitive guidance from the scientific literature, the present study assessed the relationships of demographic, individual, sex partner, peer, and family variables with the sexual risk behaviors of incarcerated adolescent girls. Its purpose was to inform the development of a targeted risk reduction intervention by indicating whether such an intervention could be delivered during the window of opportunity represented by the girls' incarceration or whether it would be more effective to involve partners, peers, or family members in an intervention delivered after the girls' release back into the community.

METHOD

PARTICIPANTS

Participants were 234 female delinquents in a girls' reformatory where the minimum court-ordered commitment is 12 weeks and the maximum stay averages 6 months. The average sentence for this sample was 16 weeks. Longer commitments are a function of the type of crime committed and the number of prior offenses. Primary reasons for this sample's arrest and incarceration were as follows: status offenses (running away, truancy, incorrigible, child in need of supervision; 33.8%); assault (25.7%); disturbing the peace/disorderly conduct (18.9%); property crimes (stealing, burglary; 12.2%); alcohol or drug-related (possession, sales; 5.4%); possession of weapons (1.4%). The balance fell into the *other* convictions category and included major crimes such as homicide.

Participants' ages ranged from 13 to 17, with a mean of 15.1 ($SD = 1.3$). All but three girls had prior appearances in the youth court system, and the average age at the time of the first youth court appearance in this sample was 13.5. The sample was 84% African American ($n = 196$), 13% Caucasian ($n = 31$), and 1% Asian and Native American ($n = 3$). Another 2% listed multiple races. Approximately 5% ($n = 12$) reported Latina ethnicity. Family of residence differed, with 17% ($n = 40$) living with biological parents before their incarceration, 42% ($n = 98$) with the mother only, 5% ($n = 12$) with the father only, 16% ($n = 37$) with one biological parent and a stepparent, and 18% ($n = 42$) with grandparents. The remaining 3% ($n = 7$) reported being in foster care, living with unrelated adults, or in one case, living alone. Overall, they were highly mobile, with 42% ($n = 98$) reporting that they moved two or more times in the year preceding their incarceration. Academic difficulties were common; 62% ($n = 145$) of the sample had repeated one or more grades in school.

Twenty-three percent ($n = 54$) of the sample disclosed gang membership. Drug and alcohol use was ubiquitous in the 6 months before incarceration, with 65% ($n = 152$) reporting cigarette use, 63% ($n = 147$) marijuana, 19% ($n = 45$) cocaine, 13% ($n = 30$) hallucinogens, and 64% ($n = 150$) alcohol. The average age of sexual debut was 13.3, typically with a partner who was 3 years older than the participant. Most of the sample (92.5%, $n = 216$) reported engaging in only heterosexual intercourse, and 87.2% ($n = 203$) of the sample was sexually active in the 3

months preceding incarceration. Most (74.4%, $n = 174$) did not consistently use condoms during intercourse; hence, it is not surprising that 30.3% ($n = 71$) had already experienced one or more pregnancies and 19% ($n = 45$) reported previous STD diagnoses. STD tests upon entry into the correctional facility found that 20% ($n = 47$) were infected with chlamydia, 4% ($n = 9$) with gonorrhea, and 1% ($n = 2$) with syphilis. None of the girls was HIV seropositive.

MEASURES

Variables were clustered into five blocks, or levels (i.e., demographic, individual, partner, peer, and family). Within each level, variables of interest were selected for inclusion based on their associations with sexual risk in other research studies. Although we could identify a number of additional measures that we would have liked to include in the assessment, particularly for additional measures at the peer and family levels, the assessment had to be parsimonious to fit within the time that the reformatory would allow during its busy intake process.

Demographic Variables—Demographic variables assessed the participant's age, race, and ethnicity.

Individual-Level Variables—Variables within the block of the individual level included school failure, gang membership, presence of tattoos or body piercing, age at the time of first appearance in youth court, age at the time of first menstruation, age at sexual debut, and the partner's age at the time of sexual debut. Two items measured perceived risk for STD/HIV on a 10-point Likert-type scale (1 = *no risk*, 10 = *very much at risk*) and perceived self-efficacy to prevent STD/HIV acquisition (1 = *not much*, 10 = *a lot*). Four additional individual-level scales are described below.

Substance Use Index: The Substance Use Index summed the number of illegal psychoactive substances that each female reported using at least once in the 6 months before entering the reformatory. The question's stem was "In the 6 months before you came to [facility], did you use ..." and it was answered dichotomously (*yes/no*) for each of six potential substances (intravenous drug use, marijuana, inhalants, hallucinogens, cocaine, and alcohol). The potential score range was 0 to 6, and within this sample, the mean score was 2.3 ($SD = 1.7$). Cronbach's alpha for this scale was .77.

Alcohol and Drug Use Scale: The Alcohol and Drug Use Scale comprised six items that assessed the extent to which substance use was having a negative impact on the participant's life. The common stem for each item was "In the past 6 months, how many times has each of the following things happened because of your drinking or drug use?" Each item used a response format that ranged from 0 (*never*) to 4 (*5 or more times*) to assess the following: trouble with parents, problems with friends, actions under the influence that the participant later regretted, nausea or vomiting, unwanted sexual encounters, and physical altercations under the influence of alcohol/drugs. Thus, the scale had a potential score range from 0 to 24, and the mean score for the sample was 5.5 ($SD = 4.9$). Cronbach's alpha for the scale was .75.

Condom Barrier Scale (CBS)—Individual subscale: Individual-level items ($n = 20$ items) from the Condom Barrier Scale (Eldridge, St. Lawrence, Little, Shelby, & Brasfield, 1995) assessed each youth's perceptions of barriers to condom use that were under her individual control. Sample items include "I don't want to put a condom on my partner" and "I usually forget about using condoms." Items were answered on a 5-point Likert-type scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Two of the authors (St. Lawrence and Snodgrass) independently reviewed the assignment of items to the individual-level and partner-level subscales (described later) with 95% agreement and identified items to be reverse-scored with 100% agreement before summing the scale. Potential scores ranged from 0 to 100, and

participants obtained a mean score of 40.0 ($SD = 12.6$). Cronbach's alpha was .90 for this subscale. Higher scores represented higher perceptions of barriers to condom use.

Victimization and Abuse Scale: The Victimization and Abuse Scale is a four-item scale that assesses personal experience with four types of violence: physical aggression that produced injuries; being shot, stabbed, knifed, or assaulted with a weapon; unwanted sexual touching of the vagina; rape or forced sex. These items were originally included in a larger instrument, the Childhood Sexual Experiences Questionnaire (Stevenson & Gajarsky, 1992); that is, we extracted four items relevant to our research focus. Items were answered on a dichotomous *yes/no* format and then summed. The potential score range was 0 to 4, and the sample mean was 1.2 ($SD = 1.3$). Cronbach's alpha for this scale was .63.

Partner-Level Variables—Five variables constituted the partner-level domain; the first was the age discrepancy between the participant's current age and that of her current partner. The other four variables were measured with the scales described below.

Partner Control and Coercion Scale: Four items comprised the Partner Control and Coercion Scale, assessing partner's behaviors in the past 6 months. Representative items are as follows: "In the past 6 months has a boyfriend tried to control where you go, who you see, or what you do?" and "In the past 6 months, has a boyfriend pressured you to have sex in a way you didn't like or when you didn't want to?" Using the dichotomous response format described earlier, possible scores on this scale ranged from 0 to 4, and the mean score was 0.9 ($SD = 1.1$). Cronbach's alpha was .76 for this scale.

Partner Communication Scale: The Partner Communication Scale included five items answered on a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). The items were adapted from measures developed by DiClemente et al. (2004). Representative items include the following: "My boyfriend/partner and I never had a heart-to-heart or serious talk about sex" and "It is hard to tell my partner that I want to be cuddled without sex." The scale's range of possible scores was from 5 to 20, and the mean score for this sample was 9.6 ($SD = 3.9$). Cronbach's alpha was .79. Higher scores represent less discussion with partners.

Partner Violence and Neglect Scale: Six items were included on the Partner Violence and Neglect Scale, which had a potential range of 0 to 18. The questions asked how often the participant refrained from bringing up a topic, out of fear that the partner would threaten to hit her, threaten to leave her, swear or be otherwise verbally abusive, initiate physical abuse (such as hitting, pushing, or kicking), or turn to other girls. Items were answered on a 4-point Likert-type scale (0 = *never*, 3 = *always*). Higher scores reflect greater reports of partner violence or intimidation. The mean score for the sample was 3.1 ($SD = 4.9$), and Cronbach's alpha was .79.

Condom Barrier Scale—Partner subscale: The Partner subscale of the Condom Barrier Scale (Eldridge et al., 1995) includes nine items that assess the participants' perceptions of partner barriers to using condoms during intercourse. A representative item is "If I asked my partner to use a condom, he might get angry." Each item was answered on the same 5-point Likert-type scale described earlier for the Individual subscale of the Condom Barrier Scale. The potential score range was from 9 to 45, and higher scores reflect greater perceived partner barriers to using condoms. The mean score for this sample was 15.9 ($SD = 6.2$). Cronbach's alpha for the scale was .87.

Peer Influence Measures—Two scales assessed the relationship of risky behavior among the peer's social networks and the perceived social support from peers. The first scale assessed

the extent to which the participant was embedded in high-risk peer networks, and the second assessed the extent to which the participant relied on social support from her peers.

Peer Network Scale: The Peer Network Scale included five variables and attained a Cronbach's alpha of .69. A sample item is "How many of your friends have sex just for fun?" Items were answered on a 5-point Likert-type scale that ranged from 0 (*none*) to 4 (*all of them*). Items were first recoded so that higher values represented higher-risk peer networks; they were then summed into a total score that could range from 0 to 20. The mean score was 7.4 ($SD = 4.4$).

Peer Social Support Scale: The Peer Social Support Scale included four variables measured on 5-point Likert-type scales that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were adapted from measures developed by DiClemente et al. (2004). A sample item is "I can count on my friends when things go wrong." Total scores could range from 5 to 20, with the higher value representing greater peer support. The mean score for this sample was 15.7 ($SD = 3.8$). Cronbach's alpha for this scale was .91.

Family-Level Measures—The final block of variables included four family-level measures: family transience (the number of household moves in the previous year), participants' reports of the number of years of schooling that their mothers had completed, the Family Communication Scale, and the Family Social Support Scale.

Family Communication Scale: The Family Communication Scale included 10 items that assessed whether the participant had discussed each of 10 subjects with her mother or another female relative, such as a grandmother or aunt. Items were adapted from measures developed by DiClemente et al. (2004). The 10 topics (dating, menstruation, masturbation, sex, contraception, STDs, sex before marriage, condoms, birth control, boyfriend problems) were answered dichotomously (*yes* = 1, *no* = 0). Higher scores indicate greater reports of communication with a larger number of family confidants. With a possible range from 0 to 10, the mean score was 6.2 ($SD = 2.6$). The scale attained a Cronbach's alpha of .76.

Family Social Support Scale: The Family Social Support Scale included four items that were adapted from measures developed by DiClemente et al. (2004) and that were answered with a 5-point Likert-type format that ranged from 1 (*strongly agree*) to 5 (*strongly agree*). A sample item is "I get the emotional help and support I need from my family." Hence, the possible score range was from 4 to 20, with higher values representing higher perceptions of supportive family members. The sample's mean score was 15.3 ($SD = 4.6$). Cronbach's alpha for the scale was .92.

Dependent Variable: Sexual Risk Index—The dependent measure was a 6-point risk index that captured risk for unwanted pregnancy, STDs, and HIV. The risk index summed three dichotomous variables—participants' report of a past pregnancy, past or current STD, engaging in unprotected penile–vaginal intercourse (1 point each)—and the number of lifetime sex partners (where 0 = *no vaginal sex and no reported partners*, 1 = *one partner*, 2 = *two to four partners*, 3 = *five or more partners*). Mean score on the risk index was 2.6 ($SD = 1.3$). Cronbach's alpha was .76.

PROCEDURES

Incarcerated girls were recruited by two project staff at a reformatory located in a state where the incidence of heterosexually acquired HIV and STDs is higher than it is in other parts of the country (Hall, Li, & McKenzie, 2005). Recruitment and baseline assessments took place during the reformatory's standard 7-day intake period during a 22-month window from September

2004 through June 2006.¹ Any female who was 13 to 17 years of age and housed in the general population was eligible for participation, and 96% of the girls who were approached agreed to participate. Potential participants were excluded if they were housed in the facility's maximum-security unit or if they participated in the study during an earlier commitment. Following informed assent from the youth and in loco parentis consent from the reformatory (because all of the youths were court-ordered into the facility's custody), measures were administered by an audio computer-administered self-interview in a private location to foster disclosure of sensitive behaviors. All girls were also tested for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, syphilis, and HIV. The assessment required approximately 90 min for completion. The protocol for this study was reviewed and approved by the Mississippi State University Institutional Review Board and by the federal Office of Human Research Protections Panel on Prisoners.

RESULTS

DATA ANALYSIS

The data were analyzed using SPSS 13.0. Descriptive statistics (means, standard deviations, and frequencies) assessed sample descriptive information. Any variable with less than 3% missing data had the mean value from the sample substituted to retain the participant in the analysis. The primary analysis used a stepwise block entry for each domain of variables (demographic, individual, peer, partner, and family) into a multiple linear regression analysis. Demographic and then individual-level variables were entered as the first and second blocks in each equation because we knew that we could readily develop and deliver an intervention to the girls while they were incarcerated. The additional question of primary interest was whether peers, partners, or families accounted for significant additional variance, suggesting that the intervention would need to bridge the youths' release back into the community and engage significant others into the prevention program. The sequence for order of entry in the initial regression was as follows: demographic, individual, partner, peer, and then family variables.

Regression analysis evaluating factors associated with risk for pregnancy, STDs, and HIV—Table 1 presents the correlation matrix for all the variables. Two demographic variables, race and Hispanic ethnicity, were uncorrelated with the dependent variables and subsequently excluded from the final analysis, leaving age as the only demographic variable in the first block.

As shown in Table 2, only two of the five blocks in the stepwise multiple linear regression analysis were statistically significant: demographics (age) and individual-level variables. The blocks with partner, peer network, and family variables did not account for significant additional variance and are therefore not discussed further.

As a precautionary check, six additional regression analyses systematically varied the order of entry for the last three variable blocks to clarify whether the pattern of findings would differ based on entry order. The pattern of the findings did not change when the order of entry for partner, peer, or family variables varied. Table 3 presents the beta value, standard error, *t* value, and significance level for each variable in the initial stepwise regression analysis.

Demographic variable—As shown in Table 2, age evidenced a significant relationship with risk. As expected, older girls attained higher values on the risk index.

¹The duration of recruitment was longer than originally planned because of Hurricane Katrina, which necessitated immediate release of all inmates and closure of the facility for a number of months and a subsequent federal investigation of institutional abuse that prompted early release of a substantial number of inmates immediately before the arrival of the investigators.

Individual-level variables—Five variables within this level attained statistical significance, and the level as a whole accounted for 40% of the variance in the risk index. As shown in Table 3, participant's age, age at sexual debut, gang membership, higher perceptions of being at risk for STDs, and higher levels of substance use were each positively correlated with risk.

DISCUSSION

No previous study has assessed the relationships between individual, partner, peer, and family variables and incarcerated girls' sexual risk behaviors to identify the appropriate timing and delivery of risk reduction interventions. In fact, there are no reports in the literature of any intervention efforts for this vulnerable population of youths. The findings from the present research were surprising in some respects and encouraging in others. Each level in this analysis and the variables within each domain were chosen because they emerged as risk correlates in one or more other research studies with adolescents. Despite the relationships identified from other studies, when the variables were sequentially included as blocks within our stepwise regression analysis, partner, peer, and family influences did not emerge as significant predictors of risk. Instead, only the individual-level variables were significantly associated with sexual risk among delinquent girls.

At first glance, the lack of significance for the partner, peer, and family variables seems at odds with some of the previous research findings (e.g., Bachanas et al., 2002; French & Dishion, 2003; Hingson et al., 2003; Jeltova et al., 2005; Kuttler & LaGreca, 2004; Wight et al., 2006). However, several differences between the samples in those earlier studies and this study's participants may account for the differing results. First, almost all the existing studies were conducted with nondelinquent female adolescents, whereas this study's sample was postadjudication incarcerated delinquent girls, a population that differs from less impaired samples of youth in the community. These results also might be explained in terms of indoctrination and identity theory (see Marcia, 1966). For example, the fully indoctrinated gang member may, in her commitment to gang membership, completely embrace gang behavior (including risky sexual behavior) as her behavioral choice rather than as a group norm to which she has subjugated her individual options. However, the present results suggest that individual-level variables are the strongest predictors of risky sexual behavior and so represented a defensible initial intervention approach.

The findings were encouraging in that they suggest that an intervention can be implemented directly to delinquent adolescent girls using the window of opportunity represented by their incarceration, without the necessity of recruiting peers, partners, or families into the initial intervention. Given these findings, we have adapted an evidence-based intervention that is now in the process of being delivered to delinquent girls before their release from the correctional facility. These young women will be followed for a year after their return into the community to assess the durability of intervention outcomes under real-world conditions.

This study and its findings include limitations that should be acknowledged. First, the results reflect the participants' perceptions of partners, peers, and families. Had data been gathered directly from partners, peers, and families, different relationships might well have emerged with different intervention implications. In addition, the data are subject to the limitations of self-report and to the possibility that the girls might have felt constrained from honest responding within the correctional facility, despite our efforts to ensure confidential and valid responding through the audio computer-administered self-interview method and private space where they could respond unobserved. The assessment battery attended carefully to methods known to increase the accuracy and reliability of self-report (Kauth, St. Lawrence, & Kelly, 1991; McFarlane & St. Lawrence, 2007), but the extent to which bias may have been implicit cannot be entirely discounted. We should note that partner variables did show a nonsignificant

trend that might have crossed into significance with a larger sample. However, the only partner variable that might have emerged with a significant relationship was that of the current partner's age discrepancy (older age). Fortunately, that is a risk factor that can be addressed in an individual-level intervention. Because of time constraints, the assessment was parsimonious, of necessity, and there may be unmeasured influences that warrant consideration in an intervention's delivery or timing for these girls. It is also possible that the age discrepancy at sexual debut was misplaced as an individual-level variable and should have thus been clustered with the other partner-level measures. Our rationale for this placement was that the age discrepancy at debut reflected a historical factoid that could not be changed by an intervention, whereas all the variables within the partner level were specific to the current partners and thus potentially changeable. Given the average lapse of 3 years between the initial and current partners, we thought that it was unlikely that the same partners were represented in both variables. In addition, some of the measures represented items selected from validated measures to shorten the existing scales; even though these shorter scales attained adequate reliability, each scale's validity may have been compromised, given that these items were no longer embedded in the parent scale. In addition, the single-item measures (such as perceived risk and perceived self-efficacy), though standard items in this literature, cannot by definition have their reliability calculated. Finally, none of the participants was HIV-seropositive, despite high prevalences of unplanned pregnancies and STDs upon entry into the study. Although all these data, taken together, attest to these adolescents' high potential risk for HIV infection, at the time of this study they had evaded that consequence.

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TABLE 1

Correlation Matrix

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1	.36	.08	.20	.25	.10	.49	.27	.05	.20	.34	.11	.16	.31	.09	.31	.03	.13	.09	.32	.03	.09	.04	.06	.10	
2		.13	.02	.11	.50	.15	.09	.24	.30	.13	.04	.05	.08	.05	.08	.11	.09	.02	.11	.01	.12	.00	.03	.13	
3			.02	.04	.03	.09	.02	.01	.00	.12	.01	.02	.06	.15	.03	.05	.15	.10	.07	.03	.01	.02	.03	.05	
4				.08	.06	.24	.17	.03	.02	.09	.08	.17	.04	.00	.15	.02	.03	.05	.16	.01	.08	.07	.06	.05	
5					.04	.29	.23	.05	.12	.18	.01	.14	.09	.06	.14	.07	.12	.03	.22	.07	.04	.08	.08	.01	
6						.04	.08	.28	.34	.01	.12	.10	.01	.01	.03	.07	.01	.03	.08	.09	.11	.03	.03	.07	
7							.51	.13	.17	.26	.12	.31	.11	.07	.19	.05	.10	.03	.49	.01	.08	.07	.10	.20	
8								.14	.19	.19	.23	.26	.11	.03	.13	.06	.20	.10	.36	.05	.03	.01	.03	.09	
9									.23	.10	.01	.12	.09	.06	.04	.01	.00	.01	.09	.05	.05	.07	.00	.03	
10										.34	.05	.10	.14	.14	.05	.00	.01	.03	.13	.00	.00	.05	.03	.10	
11											.11	.17	.14	.02	.44	.00	.05	.03	.24	.07	.02	.03	.02	.15	
12												.08	.12	.19	.08	.48	.05	.64	.29	.08	.03	.04	.19	.13	
13													.16	.02	.22	.03	.16	.04	.24	.08	.21	.05	.05	.26	
14														.02	.18	.23	.22	.19	.16	.10	.10	.05	.00	.10	
15															.05	.20	.12	.26	.00	.15	.12	.12	.05	.09	
16																	.01	.10	.07	.19	.02	.10	.09	.06	.02
17																		.12	.61	.13	.19	.03	.09	.22	.12
18																			.21	.19	.12	.09	.12	.07	.07
19																				.11	.17	.04	.08	.18	.03
20																					.14	.04	.01	.09	.23
21																						.08	.18	.13	.39
22																							.06	.06	.04
23																							.11	.02	.24

Note. 1 = risk index; 2 = participants age; 3 = repeated grade(s) in school; 4 = gang membership; 5 = tattoos or body piercings; 6 = age at first court appearance; 7 = age at first menstruation; 8 = age at sexual debut; 9 = perceived sexually transmitted disease risk; 10 = self-efficacy beliefs; 11 = Substance Use Index; 12 = Alcohol and Drug Use Scale; 13 = partner age discrepancy at sexual debut; 14 = Condom Barrier Scale Individual subscale; 15 = Experiences With Abuse Scale; 16 = Partner Control and Coercion Scale; 17 = Partner Communication Scale; 18 = age discrepancy with current partner; 19 = Condom Barrier Scale Partner subscale; 20 = Peer Network Scale; 21 = Peer Social Support Scale; 22 = number of moves in past year; 23 = maternal education; 24 = Family Communication Scale; 25 = Family Social Support Scale.

$p < .05$ (correlations of .10 .15), $p < .01$ (.16 .19), $p < .001$ (.20 .25), $p < .0001$ (.26 or higher).

TABLE 2
Omnibus Tests of Model Coefficients for the Stepwise Blocks Entered Into the Regression Analysis

<i>Stepwise Block</i>	<i>R²</i>	<i>R²Change</i>	<i>F Change</i>	<i>df</i>	<i>p <</i>
Demographics ^a	.13	.130	35.48	1, 232	.0001
Individual level ^a	.40	.270	7.57	13, 219	.0001
Partner level	.43	.020	2.28	4, 215	.06
Peer network level	.43	.008	1.42	2, 213	.24
Family level	.44	.003	0.30	4, 209	.88

^aSignificant block on the stepwise block entry.

TABLE 3

Individual Variables Within the Blocks

<i>Variable</i>	β	SE	<i>t</i>	<i>p</i> <
Demographic level				
Age	.340	.07	51.30	.0001
Individual level				
Repeated grade(s) in school	.002	.15	0.02	.98
Gang membership	.430	.17	2.50	.02
Tattoos/body piercing(s)	.190	.15	1.26	.21
Age at first court appearance	.010	.05	0.22	.83
Age at first menstruation	.040	.04	0.96	.34
Age at sexual debut	.170	.06	2.99	.003
Perceived sexually transmitted disease risk	.080	.03	3.13	.002
Self-efficacy beliefs	.010	.02	0.35	.72
Substance Use Index	.110	.05	2.06	.05
Alcohol and Drug Use Scale	.004	.02	0.24	.81
Partner age discrepancy at sexual debut	.020	.03	0.90	.37
Condom Barrier Scale: Individual subscale	.006	.008	0.76	.45
Experience With Abuse Scale	.050	.06	0.75	.46
Partner level				
Partner Control and Coercion Scale	.001	.02	0.08	.94
Partner Communication Scale	.020	.02	0.87	.39
Age discrepancy with current partner	.070	.03	2.49	.02
Condom Barrier Scale: Partner subscale	.020	.02	1.45	.15
Peer network level				
Peer Network Scale	.030	.02	1.48	.14
Peer Social Support Scale	.010	.02	0.47	.64
Family level				
Number of moves in past year	.060	.06	0.99	.32
Family Communication Scale	.007	.03	0.25	.80
Family Social Support Scale	.004	.02	0.21	.84
Maternal education	.000	.002	0.21	.84