The Social Context for Risky Sexual Behavior Among Adolescents

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This study supports a model of adolescents' risky sexual behavior in which this behavior is seen as a product of the same peer and family factors which influence a wide range of problem behaviors. The Patterson et al. (1992) model of peer and parental factors associated with adolescents' sexual risk-taking behavior was tested on three independent samples of adolescents, ages 14 through 18. Adolescents whose peers were reported to engage in diverse problem behaviors were more likely to engage in risky sexual behavior. Poor parental monitoring and parent–child coercive interactions were associated having deviant peers, and poor parental monitoring also had a direct relationship to risky sexual behavior. Family involvement was associated with fewer parent–child coercive interactions. Less availability of parental figures in the family was directly associated with risky sexual behavior and was also associated with poorer parental monitoring.

INTRODUCTION

A significant proportion of adolescents engages in sexual behaviors that risk infection with sexually transmitted diseases (STDs). One's risk of

sexually transmitted disease infection is a function of the number of part-
ners one has, the behaviors one engages in with those partners (such as
sexual intercourse without use of a condom), the probability that those
partners have a sexually transmitted disease, and the transmissibility of the
disease (Brunham and Plummer, 1990). A recent study of a nationwide,
representative sample of adolescents indicated that 71.9% of high-school
seniors were engaging in sexual intercourse (Centers for Disease Control
and Prevention, 1991), and the majority of those who were sexually active
reported no condom use at last intercourse (Centers for Disease Control
and Prevention, 1992a). Adolescents show high rates of STD infection
(such as chlamydia, syphilis, gonorrhea, venereal warts, and trichomonas)
(Centers for Disease Control and Prevention, 1992b), and since the sexual
behaviors that place one at risk for these STDs are the same as those that
risk Human Immunodeficiency Virus infection, public health officials are
increasingly concerned that HIV infection may spread rapidly through the
heterosexual adolescent population (Coates, 1990; Oh *et al.*, 1988; O'Reilly
and Aral, 1985; Strunin and Hingson, 1987). In addition, some of these
sexual practices also risk pregnancy. Rates of unwanted adolescent preg-
nancies remain high, and adolescent pregnancy has been shown to have
numerous negative social and health consequences to adolescent mothers
and their children (Hayes, 1987; Hofferth and Hayes, 1987; Rosen *et al.*,
1990). Thus, reduction of the incidence of risky sexual behavior among ado-
lescents should be a major public health goal.

   The present study focuses on the role that an adolescent's social en-
vironment may play in fostering such sexual behavior. Knowledge of how
the social environment contributes to sexual risk-taking might help to clarify
how such environments could be modified in the interest of preventing
these behaviors.

   The present study approaches this question from a different perspec-
tive than many that have examined the peer and parental influences on
adolescent sexual behavior. Many studies of parental influences on adoles-
cent sexual behavior have focused narrowly on the communications about
sex that do or do not occur between parents and children. The limited
parental influences found in these studies may be due to infrequent par-
ent–child communication about sexuality and sexual behavior (Brooks-
Gunn and Furstenberg, 1989; Fox, 1980; Hofferth and Hayes, 1987; Kast-
ner, 1984). Studies of peer influences have typically focused on the
influence of the sexual activity of peers on an adolescent's sexual behavior.
For example, measures of the perceived and the actual sexual behavior of
best friends have been shown to predict engagement in sexual activity and
contraceptive behavior (Billy and Udry, 1985a, b; Brooks-Gunn and Fur-
stenberg, 1989; Delamater and MacCorquordale, 1979; Hagenhoff *et al.*,

1987; Hofferth and Hayes, 1987; Jessor, 1977; Lowe and Radius, 1987). We are aware of only one study, however, that has examined the relationship between adolescent sexual behavior and peer engagement in deviant behavior generally. Capaldi (1991) found that ninth-grade boys' initiation of sexual intercourse could be significantly predicted from their association with deviant peers in the fourth grade.

The present study examines whether the sexual risk-taking behavior of adolescents is influenced by parents and peers in more indirect ways. Based on work done primarily at the Oregon Social Learning Center (e.g., Loeber and Dishion, 1983; Patterson and Bank, 1989; Patterson et al., 1989, 1992; Ramsey et al., 1988), this study examines whether there is empirical support for a model in which coercive family interactions and poor parental monitoring of adolescents' behavior affect the likelihood that these adolescents will drift into associations with peers who engage in diverse problem behaviors; these associations with deviant peers are, in turn, hypothesized to increase the likelihood that the young person engages in risky sexual behavior. Such a model has provided a good account of the social influences on antisocial behavior (Dishion et al., 1991; Loeber and Dishion, 1983; Patterson and Bank, 1989; Patterson et al., 1989, 1992; Ramsey et al., 1988). The strong interrelationships consistently found among adolescent problem behaviors such as antisocial behavior, tobacco, alcohol, and drug use, risky sexual behavior, and school failure (Donovan and Jessor, 1985; Donovan et al., 1988; Jessor and Jessor, 1977; Metzler et al., 1994a; Osgood et al., 1988) suggest that this model may be more broadly applicable to other problem behaviors. Indeed, the same general model has been shown to predict the onset of substance abuse (Dishion and Capaldi, 1994; Dishion et al., 1988) and sexual behavior in boys (Capaldi, 1991) and to account for a measure of engagement in diverse problem behaviors (Metzler et al., 1994b).

The present study also examines whether the level of positive involvement among family members is associated with coercive interactions and poor parental monitoring, and thus is indirectly associated with risky sexual behavior. Some evidence indicates that positive family interactions are associated with lower levels of sexual activity (Brooks-Gunn and Furstenberg, 1989; Delamater and MacCorquordale, 1979; Fox, 1980; Hofferth and Hayes, 1987; Miller and Simon, 1974) and more regular contraceptive use (Fox, 1980).

Finally, this study examines the relationship of the availability of parenting figures to parenting practices, association with deviant peers, and engagement in risky sexual behavior. The nature of the family structure may be associated with differences in parenting practices and associations with deviant peer groups, and it may be more directly associated with risky

sexual behavior. Compared to families with two natural parents living in the home, adolescents from single-parent families have been found to engage in greater and earlier sexual activity (Flewelling and Bauman, 1990; Hofferth and Hayes, 1987; Newcomer and Udry, 1987; Stern et al., 1984) and less regular contraceptive use (Zelnick et al., 1981).

Preliminary evidence of the influences of these social factors on risky sexual behavior was presented by Biglan et al. (1990). However, that study did not use path analytic techniques which permit a more complete analysis of the interrelationships among the predictors of risky sexual behavior. The present study provides a path analysis of the social context for sexual risk-taking using a new sample of adolescents and examines the replicability of the path model on the two samples that were reported on by Biglan et al. (1990).

METHOD

Subjects

Primary Sample. The subjects in this study were 609 adolescents who ranged in age from 14 through 17; 63% were female. Subjects were recruited through their membership in a large health maintenance organization (HMO) to participate in an experimental evaluation of an adolescent smoking cessation program. Initially a brief screening questionnaire was sent to all age-eligible members of the HMO. The screening was used to identify smokers, and a sample was then chosen to establish an 8-to-1 ratio of current smokers to nonsmokers. The data used here are from the baseline assessment only and thus were not subject to any experimental manipulation. Ninety-one percent of the subjects in this sample were Caucasian, approximately 3% were African-American, 3% were Native American or Asian, and less than 2% were Hispanic.

One parent of each subject in this sample was also asked to provide questionnaire data. Data were obtained from parents of 89% of the subjects. Of these parents, 91% were mothers or female guardians, and the remainder were fathers or male guardians.

Replication Sample 1. The replication samples in this study have been described in more detail in previous papers (Biglan et al., 1990; Metzler et al., 1992) and are the sample on which the original correlations between risky sexual behavior and social context were reported by Biglan et al. (1990). The first of these two samples consisted of 131 adolescents (51% female) from a mid-sized city in the Pacific Northwest, ages 15 through 17. These adolescents were recruited via flyers and advertisements to par-

ticipate in a questionnaire study about "teenage lifestyles." Subjects were paid $20.00 for their participation. Ninety percent of the subjects were Caucasian, 3% African-American; 5% Native American, and 2% Hispanic.

Data were also collected from one parent of 81% of the subjects, and parents were paid $10.00 for their participation. Ninety-three percent of these parents were mothers or female guardians, and the remainder were fathers or male guardians.

Replication Sample 2. The second replication sample consisted of 99 adolescents (42% female), aged 15 through 18, living in the same city and recruited in the same manner as the first replication sample. These subjects were also paid $20.00 to participate. Eighty-nine percent of the subjects in this sample were Caucasian, 2% were African-American, 4% were Native American, and 1% were Hispanic. No data from parents were collected for this sample.

Procedures

Primary Sample. The subjects in this sample completed a lengthy questionnaire regarding diverse problem behaviors and peer and family context factors. These data were collected during a home assessment. Subject's parents also provided data during the same home assessment.

Replication Samples. Subjects in these samples came to project offices to complete the questionnaires and were paid for doing so. Subjects in Replication Sample 1 were then given questionnaires to take to a parent. Parents were asked to return the questionnaires via postage-paid mail and were paid for doing so.

Measures

Subjects completed a lengthy (approximately 45-min) questionnaire containing questions regarding diverse adolescent problem and prosocial behaviors as well as questions about the subjects' family environment and peer environment. Identical adolescent questionnaires were used in the replication samples; a small number of items were not available for the Primary Sample. Parent instruments in the Primary Sample and Replication Sample 1 were very similar.

Sexual Risk-Taking. The Scale of Sexual Risk-Taking (SSRT) (Metzler *et al.*, 1992) was used to measure overall sexual behavior that risks sexually transmitted diseases and pregnancy. Much of the current research in adolescent sexual behavior focuses narrowly on a single aspect of sexual risk, such as condom use or age at first intercourse (e.g., Hofferth and Hayes,

1987; Pleck, 1989). In a previous study, however, it was shown that diverse sexual risk-taking behaviors were interrelated to the extent that a construct of risky sexual behavior was justified (Metzler *et al.*, 1992). For example, lack of condom use was significantly related to having a greater number of partners, having nonmonogamous partners, and having partners one did not know well. To the extent that individual risky sexual behaviors cooccur, a narrow focus on a single aspect of sexual risk (such as frequency of condom use) is likely to ignore other important sources of sexual risk for adolescents. Since the present analysis is concerned with the social context for adolescent sexual risk-taking in general, the SSRT was used as the dependent variable.

The development of the SSRT and the relationships among the individual sexual behaviors are described in more detail in Metzler *et al.* (1992). Table I presents the items that comprise the scale and the alpha coefficient (Cronbach, 1951) for the scale across all three samples.[3] Briefly, this scale is a composite of 13 adolescent self-report items, 8 of them identified as posing a "high risk" for acquiring STD infection (such as frequency of condom use and number of sexual partners in the past year) and five of them deemed "medium risk" (such as use of alcohol during sexual activity and overall contraceptive use).[4] Many of these items were adapted from the work of Capaldi and Patterson (personal communication, January 1988) and Gilchrist (personal communication, February 1988). These items were standardized and averaged to create one composite risk scale. Because they pose greater risk for transmission of STDs, the high-risk items were double-weighted in the scale and the medium-risk items were unit-weighted. Higher scores indicate higher levels of sexual risk-taking.

Family and Peer Context. Items from the adolescent and parent questionnaires were used to develop measures of the adolescents' peer and family context. Most of these items have been validated in prior research. Questions concerning positive and negative family interactions were adapted from the Family Environment Scale (Moos and Moos, 1986) and the Conflict Behavior Questionnaire (Prinz *et al.*, 1979). Measures of parental monitoring and peer behavior were adapted from the work of Capaldi and Patterson (1989). Items concerning parent availability were developed for the present study.

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[3] Two items were not available for the Primary Sample: (a) history of anal sex and (b) total months living with each parent. No parental data were available for the Second Replication Sample, so the measures of Poor Parental Monitoring and Peer Deviance are based on adolescent report only.

[4] Although data on engagement in homosexual behaviors and prostitution were gathered, these items were deleted from scale construction due to very low variance in these samples.

Table I. Cronbach's Alpha of Scales Across Each Sample

Scale	Variables comprising scale	Primary Sample	Replication Sample	
			1	2
Scale of Sexual Risk-Taking (SSRT)	(A) Number of different partners (×2)	.87	.91	.91
	(A) Sex with strangers (×2)			
	(A) Frequency of condom use (×2)			
	(A) Sex with nonmonogamous partners (×2)			
	(A) Number of times had sex with nonmonogamous partner (×2)			
	(A) Sex with partner who injects (×2)			
	(A) Has had anal sex (×2)[a]			
	(A) Ever had STD (×2)			
	(A) Has had sexual intercourse			
	(A) Number of times has had sex in past year			
	(A) Frequency of birth control use			
	(A) Use of alcohol as part of sexual activity			
	(A) Use of drugs as part of sexual activity			
Parent availability, adolescent report	(A) Parent(s) adolescent lives with	.66	.85	.82
	(A) Amount of contact with divorced parent			
	(A) Total months with each parent[a]			
Parent/child coercive interactions, adolescent report	(A) Big arguments with parent	.80	.80	.78
	(A) Parent/adolescent angry 3×/week			
	(A) Talks with parent frustrating			
	(A) Rarely argue with parent (−)			
	(A) Parent/adolescent angry once/day			
	(A) Family fights often			
Family involvement, adolescent report	(A) Family backs each other up	.86	.85	.81
	(A) Family members support each other			
	(A) No group spirit in the family (−)			
	(A) Feeling of togetherness			
	(A) Enough attention for all			
	(A) Family tries to keep the peace			
	(A) Family members get along			
Poor parental monitoring, parent and adolescent report	(P) Adult at friend's party (−)[b]	.64	.78	.65
	(P) Adult at friend's house (−)[b]			
	(P) No adult available in afternoon[b]			

Table I. Continued

Scale	Variables comprising scale	Primary Sample	Replication Sample	
			1	2
Poor parental monitoring, parent and adolescent report (continued)	(P) Parents track activities (–)[b] (A) Go places without telling (A) Parents let go anyplace	.64	.78	.65
Peer deviance	(P) Friends smoke[b] (P) Friends a bad influence[b] (P) Friends smoke marijuana[b] (P) Friends misbehave[b] (P) Friends steal[b] (P) Friends not well behaved[b] (P) Friends get in fights[b] (P) Friends drink alcohol[b] (A) Best friend smokes[a] (A) Friends hit others (A) Friends often in trouble (A) Friends vandalize property (A) Friends get in fights (A) Friends stolen items worth >$50 (A) Friends get along with adults (–) (A) Friends suggest lawbreaking (A) Friends willing to try drugs (A) Friends sold/given alcohol to minors (A) Friends could get in trouble for actions (A) Friends cheat on tests (A) Friends occasionally drunk	.90	.92	.83

[a]Item not available for Primary Sample.
[b]Item not available for Replication Sample 2.

Table I presents the items comprising all scales for each sample and their respective Cronbach alphas. These scales were created on the basis of theory and prior work of others (e.g., Capaldi and Patterson, 1989). Scales were created by standardizing and averaging each of the items comprising a scale; the mean of these standardized scores was a subject's score for each scale. Five indicators of family and peer context were created and used as independent variables in the present analysis.[5]

[5]If a subject was missing more than one-third of the items in a scale, no scale score was constructed for that subject. Those subjects who did not have sufficient data to calculate scale scores for at least five of the six scales were deleted from further analyses (17 cases across all three samples: 9 in the Primary Sample, 3 in Replication Sample 1, and 5 in Replication Sample 2). If a subject was missing only one scale score, the sample mean for

"Parent Availability" (based on adolescent report) measures the degree to which the adolescent has parenting figures available and is based on the following items: parent(s) the adolescent lives with, amount of contact with the divorced parents (if parents are divorced), and total months living with each parent. Higher scores indicate greater availability of parenting figures to the adolescent.

"Parent/Child Coercive Interactions" (adolescent report) is based on six items involving conflict between parent and child, with such items as "We have big arguments about little things," "We get angry with each other at least once a day," and "We fight a lot in our family." With the exception of the latter item, parallel items measured interactions with mother and with father, which were then averaged across mother and father into a composite parent item. Higher scores on this scale indicated greater conflict.

"Family Involvement" (adolescent report) is measured with seven items concerning positive interactions in the family, including "Family members really help and support each other" and "There is a feeling of togetherness in the family." Higher scores indicated greater family involvement.

"Poor Parental Monitoring" (adolescent and parent report) reflects the degree to which the parent supervises the adolescent and is informed about his/her whereabouts. Four parent and two adolescent items comprise this scale, including "I am able to track what my adolescent is doing," "There is an adult available at a friend's house," and "My parents let me go any place I want to." Higher scores indicated poorer monitoring on the part of the parents.

Finally, "Peer Deviance" (adolescent and parent report) measures the degree to which the adolescent associates with friends who engage in diverse problem behavior. Eight parent report items measure the degree to which the adolescent spends time with friends who engage in various problem behaviors [e.g., "Does your son/daughter hang out with kids who fight? (never — often)"], and 13 adolescent report items measure the number of friends who engage in a range of problem behaviors, including hitting, fighting, vandalizing, stealing, using substances, and cheating on tests (e.g., "During the last year, how many of your friends have ruined or damaged something on purpose that did not belong to them?"). Higher scores indicated greater exposure to deviant behavior in the peer group.

the scale was substituted (96 cases across all three samples: 65 in the Primary Sample, 27 in Replication Sample 1, and 4 in Replication Sample 2). In addition, 10 subjects in the Primary Sample and 1 subject in Replication Sample 1 were deleted because of missing data on the gender variable. Finally, to reduce error in the Parent Availability scale, 19 subjects who were both 18 years old and no longer living with their parents were deleted from Replication Sample 2 (the only sample which included 18 year olds). The final N's for analysis were thus: 591 in the Primary Sample, 128 in Replication Sample 1, and 74 in Replication Sample 2.

RESULTS

Descriptive Findings

In the primary sample, the majority of subjects (60%) was sexually active. Eighteen percent of the total sample (30% of the sexually active) reported having had sexual intercourse with more than two partners in the last year, and 45% of the sexually active reported that they never or seldom used condoms.

In the first replication sample, 69% were sexually active. Of those, 47% had had sexual intercourse with more than two partners in the last year, and 47% had never or seldom used a condom.

Sixty-eight percent of the subjects in the second replication sample reported being sexually active; 42% of the sexually active subjects reported having had more than two sexual partners in the last year, and 47% reported never or seldom using condoms.

Analytic Strategy

The hierarchical path analysis methods employed here allow the association between an independent variable and a dependent variable to be partitioned into direct and indirect effects. Specific assumptions are made about the order in which independent variables are considered to affect other variables in the model. This presumed hierarchy is then reflected in specific constraints placed on the covariance matrix during analysis. A "causal path" of the "effect" of an independent variable on the dependent variable can then be traced through the mediating independent variables. Measures of goodness of fit indicate the extent to which the specified model fits the covariance data.

The present study examines the ability of the Patterson *et al.* model of the development of antisocial behavior (e.g., Patterson *et al.*, 1992) to account for risky sexual behavior. Thus, the assumptions made about the hierarchy of variables and their relationships were based largely on the work of Patterson and colleagues. The model assumed that associations with deviant peers are the strongest and most proximal influence on sexual risk-taking. Association with deviant peers was, in turn, assumed to be influenced by coercive interactions and poor parental monitoring. It was also assumed that parental monitoring and parent availability have direct influences on risky sexual behavior. Family involvement was expected to be correlated with other family management variables but to have no direct influence on either peer deviance or sexual risk-taking itself. Finally, parent

availability was expected to be correlated with poor monitoring. When no relationship was assumed between variables, the path was set to zero.

Initially, the model was tested on the Primary Sample and its replicability assessed on the two smaller replication samples. Gender differences in the model were also tested for each sample at this point by constraining all raw covariances (regression coefficients) and variances to be equal across genders. This analysis revealed only two significant differences between boys and girls: in the Primary Sample only, the variances of both sexual risk-taking and family involvement differed by gender. Therefore, gender was included in the model as a predictor of sexual risk-taking and was allowed to covary with family involvement. This final model (with gender included) was then tested on each individual sample; these results are reported below. Finally, the samples were combined, and a multisample path analysis, using the EQS program (Bentler, 1989), was performed to test whether the three samples fit similarly. In this final analysis, all covariances (regression coefficients) and variances were constrained to be equal across samples.

Individual Sample Analyses

Path analysis of the final model on the Primary Sample indicated that the model showed a good fit to the data, with a nonsignificant chi-square and acceptable values for the goodness of fit indices ($\chi^2 = 11.14$, df = 11, $p = .43$, CFI = 1.00, NNFI = 1.00, NFI = .98).

This model was then tested on the two replication samples. Nonsignificant chi-squares and acceptable values for the goodness-of-fit indices indicated that the final model also showed a good fit to the data from these samples (Replication Sample 1, $\chi^2 = 10.68$, df = 11, $p = .47$, CFI = 1.00, NNFI = 1.00, NFI = .93; Replication Sample 2: $\chi^2 = 12.09$, df = 11, $p = .36$, CFI = .97, NNFI = .94, NFI = .79).

Multisample Analysis

A multiple population analysis was subsequently performed to test the overall fit of the model across all three samples. When all covariances and variances (with the exception of gender) were constrained to be equal across samples, goodness of fit indices were acceptable (CFI = .94, NNFI = .94, NFI = .85), although a significant chi-square indicated that the fully constrained model did not fit similarly across samples ($\chi^2 = 105.29$, df = 65, $p = .001$). Specifically, two deviations were noted. First, the variance of poor parental monitoring was significantly lower in the Primary Sample

than in the other two samples; thus, the variance for poor monitoring was allowed to vary for the Primary Sample (.38) and was constrained to be equal across the two replication samples (.61). Second, the covariance between poor monitoring and parent availability was significantly greater for Replication Sample 1 than for the Primary Sample or Replication Sample 2; thus, this covariance was allowed to vary between samples. When these two equality constraints were relaxed, the model showed a significant improvement in goodness of fit over the completely constrained model ($\chi^2_{\text{difference}}$ = 30.46, df = 2, p < .001) and the model showed a good fit to the combined data from all three samples (χ^2 = 74.83, df = 63, p = .15, CFI = .98, NNFI = .98, NFI = .89).

Figure 1 presents a summary of the significant paths, error terms, and goodness-of-fit indices for this multisample analysis. Where possible,
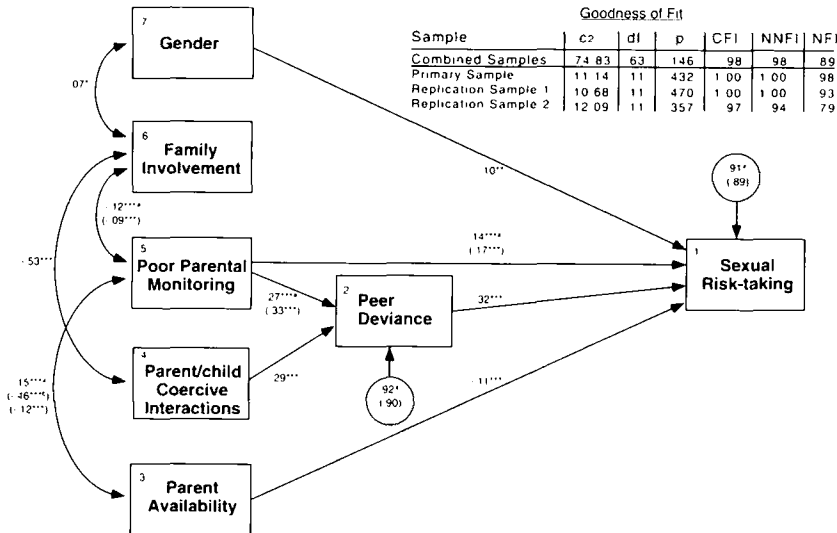

Fig. 1. Summary of significant paths in multisample path analysis. Note a: Variance for Poor Parental Monitoring was significantly lower in the Primary Sample than in the two replication samples and was released from the equality constraint. This created slight differences between samples in *standardized* path weights and error variances of related variables, although *raw* covariances and variances were constrained equal. The value for the Primary Sample is listed first, followed by the value(s) for the two replication samples. Note b: Covariance 3,5 for Replication Sample 1 differs significantly from that for both the Primary Sample and Replication Sample 2. (*) p < .05; (**) p < .01; (***) p < .001.

one coefficient that represents all three samples is presented in the figure. In some cases, however, two coefficients are presented. Although raw co-variances (regression coefficients) and variances were constrained to be equal, the difference between samples in the variance for poor parental monitoring caused slight differences in the *standardized* path weights and error variances of variables associated with poor monitoring. In these cases, the coefficient for the Primary Sample is listed first, and the coefficient that represents the two replication samples is listed second (in parentheses). In addition, three coefficients are presented (Primary Sample, Replication Sample 1, and Replication Sample 2, respectively) for the covariance between poor parental monitoring and parent availability, as this covariance could not be constrained equal across samples.

This model of the social context for sexual risk-taking explained 17% ($R = .41$) of the variance in sexual risk-taking in the primary sample and 21% ($R = .46$) of the variance in the two replication samples. All paths in the model were significant.

The largest direct predictor of risky sexual behavior was associations with deviant peers. To a lesser extent, poor parental monitoring was also directly related to more sexual risk-taking. Finally, parent availability had a small but significant direct relationship to sexual behavior; less parent availability was associated with riskier behavior.

Both parental monitoring and coercive interactions between parents and adolescents were directly related to the adolescents' associations with deviant peers. Poorer monitoring and more coercive interactions were associated with having more deviant peers, which in turn was related to greater engagement in risky sexual behavior.

Family involvement had a strong negative relationship with parent–child coercive interactions and a weaker negative relationship with poor monitoring. That is, young people who were more involved with their families reported less conflict and more supervision from their parents.

Parent availability was negatively related to parental monitoring; less intact families did a poorer job of supervising their adolescents than did more intact families. This relationship was significantly stronger in Replication Sample 1 than in the other two samples.

Gender Differences. Gender was found to be a weak but significant predictor of sexual risk-taking; girls showed higher levels of sexual risk-taking than did boys. In addition, the small but significant relationship between gender and family involvement indicated that girls reported less involvement with their families. The fit of the model, however, did not differ by gender in any of the samples, indicating that, overall, this model of the social context for risky sexual behavior fit similarly for males and for females.

DISCUSSION

General Findings

The relationships of peer and parental factors to the sexual risk-taking of adolescents replicated across the three samples. The strongest and most proximal influence on risky sexual behavior in this model appears to come from peers. Note that the measure of peer deviance in this study measured predominantly peer engagement in substance use and antisocial behaviors and included no items about peer sexual behavior. Adolescents who were associating with peers engaging in diverse problem behaviors were significantly more likely to engage in risky sexual behavior. Current evidence indicates that adolescents choose peers who are similar in characteristics to themselves and that peers then mutually influence one another through shaping, training, and reinforcing behaviors (Dishion, 1990; Fisher and Bauman, 1988; Kandel, 1985). Deviant peer groups appear to encourage engagement in a wide variety of problem behaviors, including substance use (Kandel, 1985), antisocial behavior (Dishion, 1990), and general problem behavior (Jessor and Jessor, 1977; Metzler et al., 1994). Combined with evidence of strong relationships between risky sexual behavior and other problem behaviors in adolescents (e.g., Donovan et al., 1988; Metzler et al., 1994a; Osgood et al., 1988), this raises the possibility that peer influence to engage in diverse problem behaviors makes engagement in risky sexual behavior more likely even if friends never explicitly discuss sexual behavior, perhaps through exposing the adolescent to higher-risk partners or through increasing risk-taking behavior more generally (Noell et al., 1993).

Parental failure to monitor adolescents' activities also appears to contribute to sexual risk-taking. Poor monitoring was directly associated with sexual behavior. Parents who consistently monitor their children are presumably better able to discourage risky sexual behavior directly because they have greater access to the young person's activities (Miller et al., 1986). Moreover, failures in parental monitoring appear to influence risky sexual behavior indirectly by permitting the adolescent to associate with deviant peers, a finding that is consistent with research on the influence of parental monitoring on antisocial behavior and substance use (Dishion and Capaldi, 1994; Dishion et al., 1991; Patterson et al., 1992).

Parent availability also appears to have direct and indirect influences on risky sexual behavior. Adolescents who had fewer parent figures available were slightly, though significantly, more likely to engage in sexual risk-taking. This may be a matter of greater acceptance or modeling of sexual behavior in households with only one or no parents available, although a number of possible explanations bear further investigation. Low

parent availability was also associated with poorer parental monitoring. Households with no or only one parent available presumably have less parental time available for tracking or supervising the adolescent's activities (Reid and Patterson, 1991; Steinberg, 1987). Brooks-Gunn and Furstenberg (1989) found that a similar relationship between single parenthood and poorer monitoring was associated with earlier onset of intercourse.

Coercive interactions between parents and adolescents were indirectly related to risky sexual behavior; adolescents who reported more coercive interactions with their parents were also those who associate with more deviant peers. Family involvement was negatively related to coercive interactions and to poor parental monitoring and, thus, was indirectly related to risky sexual behavior. Family involvement and coercive interactions were strongly and negatively related; families that have high levels of involvement with each other have fewer coercive interactions. These findings suggest that high levels of conflict and low levels of positive involvement with the family may weaken an adolescent's relationship to the family and thus increase their susceptibility to negative peer influence (Hawkins *et al.*, 1986).

Girls were slightly more likely to engage in sexual risk-taking and to report lower levels of family involvement than were boys. The direction of this gender difference in risky sexual behavior is somewhat unexpected and bears further exploration, although the preponderance of girls in the largest sample may partially explain this relationship. Overall, however, the general pattern of peer and parental influences on sexual risk-taking held for both sexes. Thus, the same preventive efforts directed at discouraging associations with deviant peers and encouraging parental monitoring and noncoercive interactions may be appropriate for both boys and girls.

Although the amount of variance accounted for in sexual risk-taking by this model is not large, indicating that a number of other factors also influence adolescents' risky sexual behavior, this study does provide additional support for the model of the parental and peer influences on adolescent problem behavior that has been developed at the Oregon Social Learning Center (Dishion *et al.*, 1991; Patterson *et al.*, 1989, 1992). The model has now been shown to account for antisocial behavior (Patterson *et al.*, 1992), early sexual behavior among boys (Capaldi, 1991), and drug use (Dishion and Capaldi, 1994; Dishion *et al.*, 1988). Indeed, the evidence demonstrating strong interrelationships among adolescent problem behaviors (Donovan and Jessor, 1985; Donovan *et al.*, 1988; Jessor and Jessor, 1977; Metzler *et al.*, 1994a; Osgood *et al.*, 1988) suggests that the same set of social conditions may contribute to a wide range of problem behaviors, including risky sexual behavior, antisocial behavior, and substance use. Direct support for this hypothesis is provided by a study in which a measure

of engagement in diverse problem behaviors was accounted for using the same general model examined in this study (Metzler et al., 1994b).

The approach implied by the present model can be contrasted with analyses of adolescent sexual behavior that focus more narrowly on peer and parental influences that directly involve sexual behavior. A number of other studies (Billy and Udry, 1985a, b; Delamater and MacCorquordale, 1979) have examined the degree to which adolescents' sexual behavior could be predicted from knowledge about peers' reported sexual behavior or from adolescents' perceptions of their peers' sexual behavior. Others have examined the specific ways in which parents' communication about sexual behavior affects their childrens' sexual behavior (Biglan, 1988; Fox, 1980; Kahn et al., 1984). The limited parental influences found in these studies may be attributable to the possibility that parent–child communication about sex seldom happens (Hofferth and Hayes, 1987; Brooks-Gunn and Furstenberg, 1989; Fox, 1980).

The present findings suggest that parents may influence adolescents' sexual behavior more indirectly. That is, if parents permit their children to associate with peers who engage in diverse problem behaviors, if they fail to monitor their children's activities, if they are involved in coercive interactions with their child, and/or if there are fewer parental figures available to influence the adolescent, these young people may be more likely to engage in risky sexual behavior.

Peers may influence adolescent sexual risk-taking by encouraging engagement in a wide range of problem behaviors that make risky sexual behaviors more likely (Biglan et al., 1990).

These findings suggest that preventing risky sexual behavior may require a more comprehensive effort to modify familial and peer influences on sexual behavior than simply a narrow focus on parents' communications about sexuality and on peers' sexual behavior. For example, sexual risk-taking may be prevented to some extent by preventing the formation of peer groups that are prone to deviant behavior or through increasing the extent and quality of parental supervision in general.

Replication

In general, the model replicated well across samples. The minor differences found between samples may be partially explained by different features of the various samples, including sample size, gender ratio, age range, and sampling method. For example, the larger sample size, younger age range, and larger proportion of parental data may account for the lower

variance in Poor Parental Monitoring in the Primary Sample than in the other two samples.

Limitations

Three limitations of the present study should be noted. First, these data are cross-sectional. Thus the hierarchy of variables in the model is hypothetical, as are any causative relationships that may be inferred. A particular problem with cross-sectional data involves the interpretation of evidence that sexual risk-taking is related to adolescents' reports of associations with deviant peers. The relationship could be due to peers influencing the adolescent to engage in such behavior, but it is also possible that adolescent friendship formation is influenced by similarities in sexual behavior (Fisher and Bauman, 1988). For example, those who are engaging in risky sexual behavior may become friends with others who do so.

Second, the data are based on self-report of sexual behavior and self- and parent report of context variables. This makes the data vulnerable to the biases of nonobservational data and method variance. That is, the observed relationships may be due in part to systematic perceptual biases of the sources rather than to actual relationships among the variables (Bank et al., 1990). Moreover, our reliance on adolescents' reports of their friends' behavior creates interpretive ambiguities. It is possible that the obtained relationship between sexual risk-taking and peer deviant behavior was due, in part, to adolescents rating their friends' behavior as more similar to their own behavior than it actually is (Billy and Udry, 1985b). A study that obtained reports from peers of their own behavior would clarify whether or not this is true.

Third, the samples used may not be representative of the general population due to nonrandom, nonrepresentative sampling methods. An important next step for research is to examine these relationships further on larger, more representative samples.

Summary

These results, taken together with evidence regarding the interrelationships among problem behaviors and the generality of this social context model to other problem behaviors, suggest that efforts to prevent risky sexual behavior through programs that focus narrowly on sexual behavior may have limited effects. The results underscore the need for more comprehensive efforts to address the peer and familial risk factors that are associated with a diverse range of adolescent problem behaviors, including risky sexual

behavior. If such an approach is viewed narrowly in terms of the prevention of a single behavior, such as sexual risk-taking, it may appear to be a very expensive prevention strategy. If, however, such a strategy successfully prevented a wide range of problem behaviors, such as risky sexual behavior, antisocial behavior, smoking, other substance use, and school failure, it would be justified on the basis of its potential for avoiding the substantial costs to society caused by these problems.

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