Dynamic Relationships Between Parental Monitoring, Peer Risk Involvement and Sexual Risk Behavior Among Bahamian Mid-Adolescents

CONTEXT: *Considerable research has examined reciprocal relationships between parenting, peers and adolescent problem behavior; however, such studies have largely considered the influence of peers and parents separately. It is important to examine simultaneously the relationships between parental monitoring, peer risk involvement and adolescent sexual risk behavior, and whether increases in peer risk involvement and changes in parental monitoring longitudinally predict adolescent sexual risk behavior.*

METHODS: *Four waves of sexual behavior data were collected between 2008/2009 and 2011 from high school students aged 13–17 in the Bahamas. Structural equation and latent growth curve modeling were used to examine reciprocal relationships between parental monitoring, perceived peer risk involvement and adolescent sexual risk behavior.*

RESULTS: *For both male and female youth, greater perceived peer risk involvement predicted higher sexual risk behavior index scores, and greater parental monitoring predicted lower scores. Reciprocal relationships were found between parental monitoring and sexual risk behavior for males and between perceived peer risk involvement and sexual risk behavior for females. For males, greater sexual risk behavior predicted lower parental monitoring; for females, greater sexual risk behavior predicted higher perceived peer risk involvement. According to latent growth curve models, a higher initial level of parental monitoring predicted decreases in sexual risk behavior, whereas both a higher initial level and a higher growth rate of peer risk involvement predicted increases in sexual risk behavior.*

CONCLUSION: *Results highlight the important influence of peer risk involvement on youths' sexual behavior and gender differences in reciprocal relationships between parental monitoring, peer influence and adolescent sexual risk behavior.*

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Although several prospective studies have examined reciprocal relationships between parental monitoring or knowledge and adolescent problem behavior (especially delinquency),[1–3] they did not account for the interplay between parental and peer influences and adolescent behavior. This study uses longitudinal data from the Bahamas to simultaneously examine prospective reciprocal relationships of parental monitoring and peer risk involvement with adolescent sexual risk behavior, and the longitudinal effects of the initial levels and growth rates of peer risk involvement and parental monitoring on adolescent sexual risk behavior.

Background

The Bahamas, a Caribbean country consisting of approximately 700 islands and cays, has been an independent nation since 1968. African descendants constitute 85% of the country's population;[4,5] the per capita GNP is $16,140, although wealth is highly skewed toward a small population of affluent residents.[6]

The Caribbean has the highest HIV prevalence outside of Sub-Saharan Africa. The first confirmed case of AIDS in the Bahamas was reported in 1985,[7] and by the mid-1990s, the country had the second highest annual HIV incidence in the Caribbean—an estimated 4.1% among adults.[6] Although the overall HIV prevalence in the Bahamas has declined since then, it remains high (2.8% in 2011). In addition, the country's HIV rate of 1.2% among 15–24–year-olds is a matter of concern.[8,9] In the Bahamas, nearly 60% of non-AIDS HIV cases are among individuals aged 15–34 years, who represent fewer than 20% of the population.[6] AIDS was reported as the leading cause of death among Bahamians aged 15–29.[7]

Sexual Risk Behavior Among Middle Adolescents

During middle adolescence (ages 14–16), youth undergo substantial physical maturation, but cognitive development, experience and decision-making capability may lag.[10] Adolescents may be especially vulnerable to engaging in sexual risk behaviors, such as unprotected sexual intercourse and having multiple partners,[11] which can result in adverse health outcomes, including unintended pregnancy and HIV or other STIs.[12] UNAIDS estimates that nearly half of the world's HIV infections have occurred among young people aged 15–24.[13]

Studies on risk behaviors among Caribbean youth have demonstrated that the proportions of young people having

sex at an early age, having multiple sexual partners and using condoms inconsistently have increased over time.[14,15] According to a comprehensive health survey conducted by the World Health Organization among 16,000 youth aged 10–18 in nine Caribbean nations, more than 50% of sexually active males and 25% of sexually active females reported having had their first sexual experience by age 10, and only 53% of males and females had used a condom at last sex.[16] A survey among Jamaican 15–19-year-olds found that 54% of males and 32% of females had had sexual intercourse in the past year;[15] of those, 52% of males and 12% of females had had more than one sexual partner during that period.

Family and Peer Influence

Adolescent behavior is shaped by a range of nested contextual systems.[17] Parents and peers—two major potential influences on risky and protective behaviors—have received considerable attention in the literature. Parents and peers create a social context for behavioral development, act as role models, and provide opportunity and reinforcement for risk and protective behaviors.[18]

Several longitudinal studies have used the reciprocal effects model to examine dynamic relationships between parenting and adolescent problem behavior.[19] One prospective study of middle adolescents found a reciprocal relationship between parental monitoring and adolescent delinquency: Low levels of monitoring predicted increases in delinquent behavior, and high levels of delinquency predicted decreases in parental monitoring.[1] According to a prospective study of early adolescents, parental knowledge about youths' free-time activity was negatively associated with problem behavior, and problem behavior in turn was negatively associated with parental knowledge.[2] A prospective study of middle adolescents, however, found a negative association between delinquency and parental support and control, but no relationship between parenting behavior and youth delinquent behaviors over time.[3]

Few studies have looked at the reciprocal relationship between parental monitoring and adolescent sexual risk behavior. One longitudinal study that used a national sample of adolescents to assess the bidirectional link between parental knowledge and adolescent sexual risk behavior found that higher levels of parental knowledge were associated with decreases in adolescents' risky sexual activities and that higher levels of sexual risk behaviors were negatively associated with parental knowledge.[20] According to another study, parental monitoring was more strongly correlated with problem behaviors in males than in females.[21] Our recent study of the developmental course of risk behaviors found that male and female youth followed three different risk involvement trajectories from early to middle adolescence: low-, moderate- and high-risk for males, and no-, low- and moderate-to-high–risk for females.[22] While parental monitoring and perception of peer risk involvement (i.e., sexual behavior and substance use) in early adolescence are almost equally important in predicting subsequent behaviors among males, perception of peer risk behaviors was the most influential factor among females.

Authoritarian parenting—characterized by low warmth and high levels of punitive control—has been found to be the dominant style in the Caribbean.[23,24] Physical punishment and public humiliation are preferred methods of discipline in that setting,[23,25] and these potentially harmful practices may foster behavioral problems in some children.[25] According to a study conducted in four Caribbean countries, however, adolescents reported that their parents used a mixture of parenting styles, including authoritative (generally warm, with a high level of positive or assertive control) and neglectful (low warmth and low control); authoritative was the predominant parenting style in the Bahamas.[26] Parenting styles differed by gender, with females more likely to report authoritative parenting and males more likely to report neglectful parenting.

Previous research on the reciprocal relationship between parental monitoring and adolescent delinquency and problem behavior, however, did not account for peer social influences,[1,2] and results of one study suggest that peer risk involvement might be a stronger influence on adolescent problem behavior than parenting.[27] Association with peers who exhibit problem behavior is predictive of adolescent problem behavior.[28] In addition, of adolescents who report that their friends use alcohol and drugs, a greater proportion engage in delinquent behavior or have sex than of those who do not engage in these behaviors.[29,30] Some studies of delinquency and substance use suggest a bidirectional influence between adolescents and their peers.[31,32] And according to a study of peer influence, adolescents seek friends whose attitudes about sex are similar to their own.[33]

The relative influence of parents and peers on adolescent behavior changes during adolescent development.[34] Parental monitoring decreases as children age, particularly for parents of high-risk adolescents.[35] In addition, peers increase in importance and become more influential than parents;[36] peer influence increases during early adolescence and peaks when adolescents enter their high school years.[37]

Some previous research has examined the interplay between parental and peer influences.[38] A study of adolescent problem behavior found an interaction between degrading (i.e., decreasing and less effective) parental monitoring and association with deviant peers (i.e., those with problem behaviors).[35] In addition, parental monitoring may buffer negative peer influence on adolescent risk involvement,[39] influence the type of peers with whom adolescents associate[40] and decrease the likelihood that adolescents will affiliate with deviant peer groups.[41] Furthermore, adolescents who are closely monitored by their parents may have limited opportunity to socialize with peers who engage in risk behaviors.

In summary, while there is a robust literature on adolescents, peers and parents, and their reciprocal effects, the important influences of peers and parents on adolescents'

risk involvement have largely been examined separately. The present study uses four waves of longitudinal data to investigate the complex interplay between parental and peer influences on adolescent sexual risk behavior. Specifically, we address the following four questions: Are there prospective reciprocal relations of parental monitoring and peer risk involvement to adolescent sexual risk behavior when both parent and peer risk factors are examined simultaneously? Do the reciprocal relations differ by gender? Do either parental monitoring or peer risk involvement exert a consistently stronger effect on adolescent sexual risk behavior? Finally, do increases in peer risk involvement or evolution of parental monitoring longitudinally predict adolescent sexual risk behavior in high school? Understanding how high school–age adolescents are influenced by their peers and parents is important in the design and implementation of effective interventions to modify adolescent sexual risk behaviors.

METHODS

Data

For this study, we used data from a subset of the 2,593 students enrolled in a randomized, controlled, school-based HIV prevention program targeting grade 10 students in all eight of the government high schools on the Bahamian island of New Providence; the island was selected because it is home to 65% of the nation's population, including an estimated 86% of those infected with HIV.[42] An estimated two-thirds of all students from the eight schools participated. The program included three experimental conditions and one control condition; randomization occurred at the level of the classroom. We restricted our study sample to the 770 youth—337 males and 433 females—who were randomized to serve as controls, given that our focus was on the reciprocal relationship of parental monitoring and peer risk involvement with adolescent sexual risk behavior, rather than on the intervention effect.

Data were collected using the Bahamian Youth Health Risk Behavioral Inventory, a paper-and-pencil questionnaire administered in the classroom setting.[43] Information was obtained from four survey waves: baseline in 2008/2009 (Time 1) and three follow-ups conducted at six, 12 and 18 months after the intervention (Times 2, 3 and 4, respectively). The follow-up rate was 83% at Time 2, 77% at Time 3 and 76% at Time 4. At each time, participants completed a self-administered questionnaire, which took approximately 45 minutes. Trained personnel provided explanations and instructions for completing the surveys. Parents and students were informed that participation was voluntary and that their answers were confidential. Written youth assent and parental consent were required for participation in the study. Teachers were required to leave the classrooms during the survey. Each student was given a voucher worth B$10 (US$10) after completing the survey. The research protocol including the questionnaires was approved by the institutional review boards at Wayne State University and Princess Margaret Hospital in the Bahamas.

Measures

- *Parental monitoring.* We used a validated parental monitoring scale[44] that included eight items assigned to three domains. The parental knowledge domain included two items on youths' perceptions of the extent to which parents knew about their whereabouts and activities (e.g., "My parents/guardian know where I am after school"). The youth disclosure domain consisted of three items that focused on how much adolescents told their parents about their activities (e.g., "If I am going to be home late, I tell my parents/guardian"). The parental control domain included three items on youths' perceptions of the extent to which their parents tried to supervise their activities (e.g., "When I go out, my parents/guardian tell me what time I'm going to return"). Responses were based on a five-point Likert scale ranging from "never" to "always." Individual items in a given domain were summed and averaged to yield domain scale scores of 1–5. Cronbach's alpha for the whole parental monitoring scale was 0.84; the alphas for the three domains were 0.66, 0.73 and 0.69, respectively.
- *Peer risk involvement.* Peer risk involvement was measured using 10 questions asking youth how many of their friends who were about the same age have sex, drink alcohol or use drugs. The 10 questions were assigned to two domains. The sexual behavior domain included six items and focused on youths' perceptions about their friends' sexual activity and condom use. The second domain, substance use, consisted of four items focusing on youths' perceptions of their friends' alcohol and drug use. Sample questions included "How many of your close friends have sex?" and "How many of your friends drink alcohol?" Responses were based on a three-point Likert scale ranging from "none" to "most"; items were summed and averaged to yield domain scale scores of 1–3. The Cronbach alphas for the whole scale and the two subscales were 0.79, 0.79 and 0.69, respectively.
- *Sexual risk behavior.* Youths' involvement in sexual risk behavior was assessed by asking them to report on whether they had engaged in a variety of sexual risk behaviors, including having ever had sexual intercourse, having had sex in the past six months, having had two or more sexual partners in the past six months, having had sex with a partner who was three or more years older, not having used a condom at last sex and having ever consumed alcohol 1–2 hours before having sex. The items were each assigned the same sample weight,[45] creating a sexual risk composite score that ranged from 0 to 5; higher scores indicated higher sexual risk.

Analysis

Descriptive statistics—means of perceived peer risk involvement and parental monitoring, and proportions of youth involved in specific sexual risk behaviors at baseline and at each follow-up survey—were computed and compared across time points using generalized estimating equations. We then conducted bivariate correlation analyses to examine the strength of associations among peer risk involvement, parental monitoring and sexual risk behavior (computed as a sexual risk composite score) at all four times. Descriptive and

TABLE 1. Adolescent risk behaviors reported at baseline and 6-, 12- and 18-month interviews by control-group participants in a randomized, school-based HIV prevention program targeting grade 10 students, New Providence, the Bahamas

Risk behaviors	Male youth					Female youth				
	Baseline (N=337)	6 mos. (N=271)	12 mos. (N=246)	18 mos. (N=245)	z	Baseline (N=433)	6 mos. (N=365)	12 mos. (N=343)	18 mos. (N=341)	z
PERCENTAGES										
Sexual behaviors										
Ever had sex	41.3	48.9	56.6	57.7	4.83***	18.7	26.0	34.6	40.5	7.65***
Had sex in last six mos.	29.8	34.6	42.0	46.0	4.65***	15.7	23.0	29.9	34.0	6.86***
Had multiple sex partners in last six mos.	15.1	17.2	21.7	24.2	3.05**	3.3	5.6	5.0	5.0	1.28
Drank alcohol before having sex	6.1	4.6	7.1	11.3	1.89	1.9	4.8	5.9	5.0	3.14**
Sexual partner >3 yrs. older	6.6	11.1	10.3	12.8	2.47*	8.7	11.3	13.8	15.2	3.35***
No condom use at last sex	33.1	18.7	25.4	21.6	1.85	23.3	17.4	21.6	23.5	–0.21
MEANS										
Perceived peer risk involvement (range, 1–3)†	1.87	2.00	2.04	2.04	6.03***	1.85	1.94	2.02	2.00	6.72***
	(0.47)	(0.45)	(0.45)	(0.44)		(0.46)	(0.47)	(0.46)	(0.45)	
Sexual behavior (range, 1–3)	2.14	2.27	2.29	2.32	4.85***	2.09	2.22	2.33	2.34	7.48***
	(0.61)	(0.56)	(0.55)	(0.57)		(0.59)	(0.59)	(0.58)	(0.62)	
Drug use (range, 1–3)	1.60	1.72	1.79	1.77	4.99***	1.60	1.67	1.72	1.66	2.81**
	(0.52)	(0.47)	(0.51)	(0.48)		(0.48)	(0.48)	(0.48)	(0.44)	
Parental monitoring (range ,1–5)‡	3.94	3.83	3.82	3.72	–3.62***	4.26	4.26	4.24	4.24	–0.64
	(0.83)	(0.84)	(0.88)	(0.88)		(0.72)	(0.67)	(0.71)	(0.69)	
Parental knowledge (range, 1–5)	4.18	4.15	4.13	4.01	–2.36*	4.58	4.59	4.56	4.56	–0.57
	(0.95)	(0.87)	(0.87)	(0.92)		(0.70)	(0.66)	(0.70)	(0.68)	
Youth disclosure (range, 1–5)	3.93	3.81	3.82	3.71	–2.94**	4.21	4.26	4.25	4.28	1.31
	(0.99)	(1.00)	(1.01)	(1.00)		(0.88)	(0.80)	(0.86)	(0.81)	
Parental control (range, 1–5)	3.70	3.53	3.54	3.44	–3.31***	4.01	3.93	3.89	3.83	–2.82**
	(1.08)	(1.12)	(1.14)	(1.07)		(1.07)	(1.02)	(0.99)	(1.04)	

*p<.05.**p<.01.***p<.001. †Index was based on 10 questions assessing respondents' perception of how many of their same-aged friends have sex, or use drugs or alcohol; higher scores indicate higher perceived peer risk behavior. ‡Index was based on eight questions assessing respondents' perception of the extent to which their parents know about their whereabouts and activities, how much respondents tell their parents about their activities and respondents' perception of the extent to which their parents try to supervise their activities; higher scores indicate higher parental monitoring. Figures in parentheses are standard deviations.

bivariate analyses were performed using SAS 9.3.

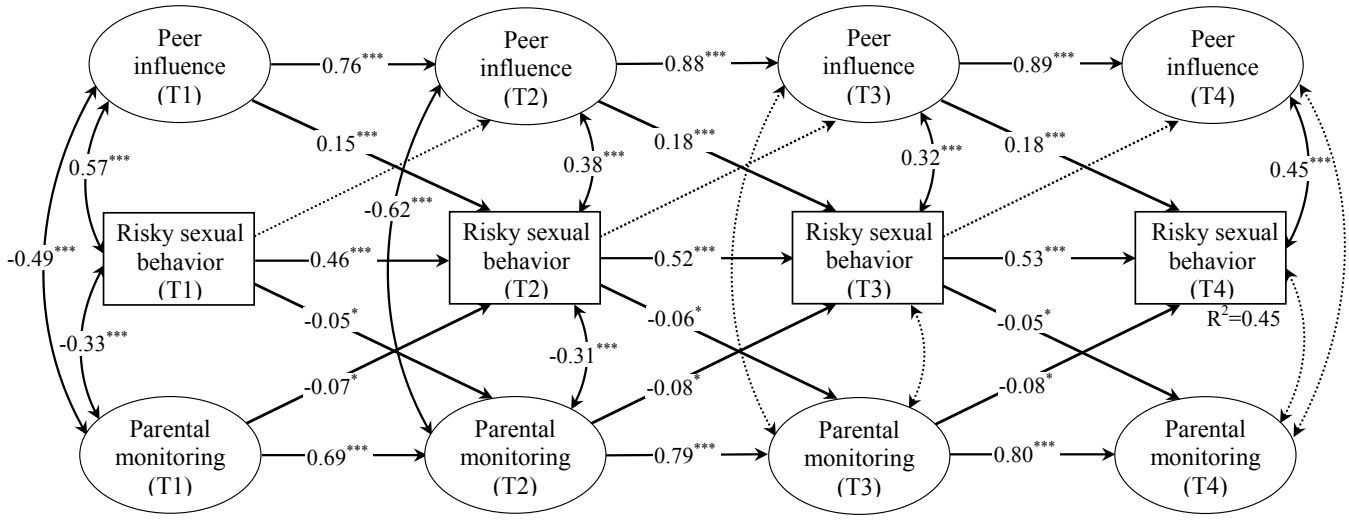
We conducted structural equation modeling analyses using longitudinal data to examine the reciprocal effects between parental monitoring, peer risk involvement and adolescent sexual risk behavior. This involved a two-step process. First, we examined the reciprocal relationships of parental monitoring and peer risk involvement with adolescent sexual risk behavior in separate parent-adolescent and peer-adolescent models because we were concerned that the collinearity between predictors could lead to unstable parameter estimates; these models were run separately for males and females. Second, a full model was constructed to simultaneously examine the dynamic relationships of both parental monitoring and peer risk involvement with adolescent sexual risk behavior ("parent-peer-adolescent model"); this model controlled for age at baseline. The sexual risk behavior score was positively skewed; log transformation was used to improve the distributional properties of this variable. In these models, parental monitoring at Times 2–4 was regressed on parental monitoring and sexual risk behavior at Times 1–3; peer risk involvement at Times 2–4 was regressed on peer risk involvement and sexual risk behavior at Times 1–3. Likewise, sexual risk behavior at Times 2–4 was regressed on parental monitoring and peer risk involvement at Times 1–3. The concurrent correlations among the disturbances

TABLE 2. Correlations between peer risk involvement, parental monitoring and sexual risk behavior at Times 1–4

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Mean	SD
1. Age	1.00														14.55	0.78
2. Gender	–0.09*	1.00														
3. Peer risk involvement (T1)	0.07*	–0.02	1.00												1.86	0.47
4. Parental monitoring (T1)	–0.01	0.20***	–0.33***	1.00											4.12	0.79
5. Sexual risk behavior (T1)	0.10**	–0.24***	0.33***	–0.28***	1.00										0.92	1.64
6. Peer risk involvement (T2)	0.06	–0.06	0.57***	–0.24***	0.27***	1.00									1.96	0.46
7. Parental monitoring (T2)	–0.01	0.28***	–0.23***	0.59***	–0.24***	–0.33***	1.00								4.08	0.78
8. Sexual risk behavior (T2)	0.12**	–0.18***	0.32***	–0.26***	0.52***	0.39***	–0.31***	1.00							1.10	1.69
9. Peer risk involvement (T3)	–0.01	–0.02	0.51***	–0.16***	0.19***	0.68***	–0.24***	0.33***	1.00						2.03	0.46
10. Parental monitoring (T3)	–0.01	0.25***	–0.16***	0.44***	–0.19***	–0.27***	0.64***	–0.28***	–0.26***	1.00					4.07	0.81
11. Sexual risk behavior (T3)	0.09*	–0.18***	0.30***	–0.24***	0.47***	0.33***	–0.34***	0.66***	0.39***	–0.29***	1.00				1.38	1.83
12. Peer risk involvement (T4)	0.03	–0.05	0.46***	–0.20***	0.21***	0.65***	–0.28***	0.29***	0.72***	–0.28***	0.33***	1.00			2.02	0.45
13. Parental monitoring (T4)	–0.05	0.31***	–0.15***	0.48***	–0.13**	–0.24***	0.61***	–0.21***	–0.23***	0.71***	–0.27***	–0.26***	1.00		4.02	0.82
14. Sexual risk behavior (T4)	0.07	–0.18***	0.29***	–0.27***	0.44***	0.31***	–0.32***	0.61***	0.36***	–0.27***	0.76***	0.37***	–0.25***	1.00	1.53	1.92

*p<.05. **p<.01. ***p<.001. *Notes:* T1=baseline; T2=6 mos.; T3=12 mos.; and T4=18 mos. SD=standard deviation. For gender, male=0 and female=1.

FIGURE 1. Reciprocal relationships between peer risk involvement, parental monitoring and risky sexual behavior among male adolescents



*p<.05. **p<.01. ***p<.001. *Notes:* T1=baseline; T2=6 mos.; T3=12 mos.; and T4=18 mos. Bold lines indicate significant paths.

or residuals of parental monitoring, peer risk involvement and sexual risk behaviors were also included in the model.

The final analytic step extended the latent growth curve model by examining simultaneous associations of changes in peer risk involvement and parental monitoring and effects of initial levels and growth rates of peer risk involvement and parental monitoring on sexual risk behavior at Time 4; the model was run separately for males and females. Structural equation modeling and latent growth curve modeling analyses were performed using Mplus 7.

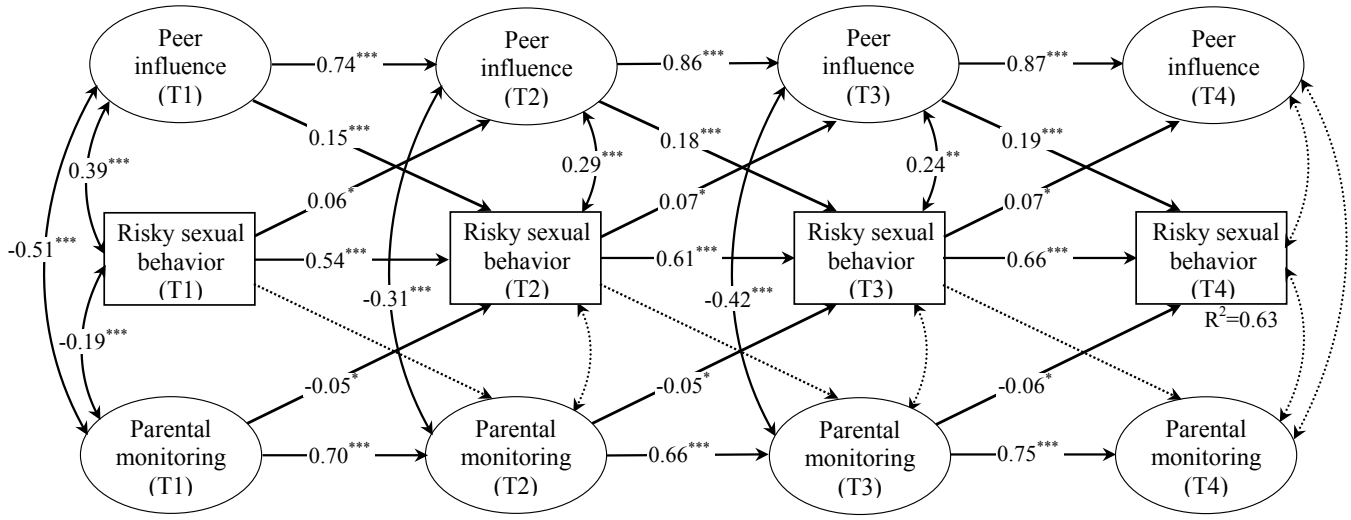
Standardized regression coefficients for all paths were estimated using robust maximum likelihood estimation. Missing data were handled using the full information maximum likelihood method. Goodness of model fit was assessed by calculating the ratio of chi-square to degrees-of-freedom (χ^2/df), root mean square error of approximation (RMSEA), Bentler's comparative fit index (CFI) and Tucker- Lewis index (TLI). Acceptable model fit was determined by an RMSEA less than 0.08, values of CFI and TLI greater than 0.90, and a χ^2/df ratio less than 3.[46,47] Path coefficients were considered significant at α<0.05.

RESULTS

Descriptive Findings

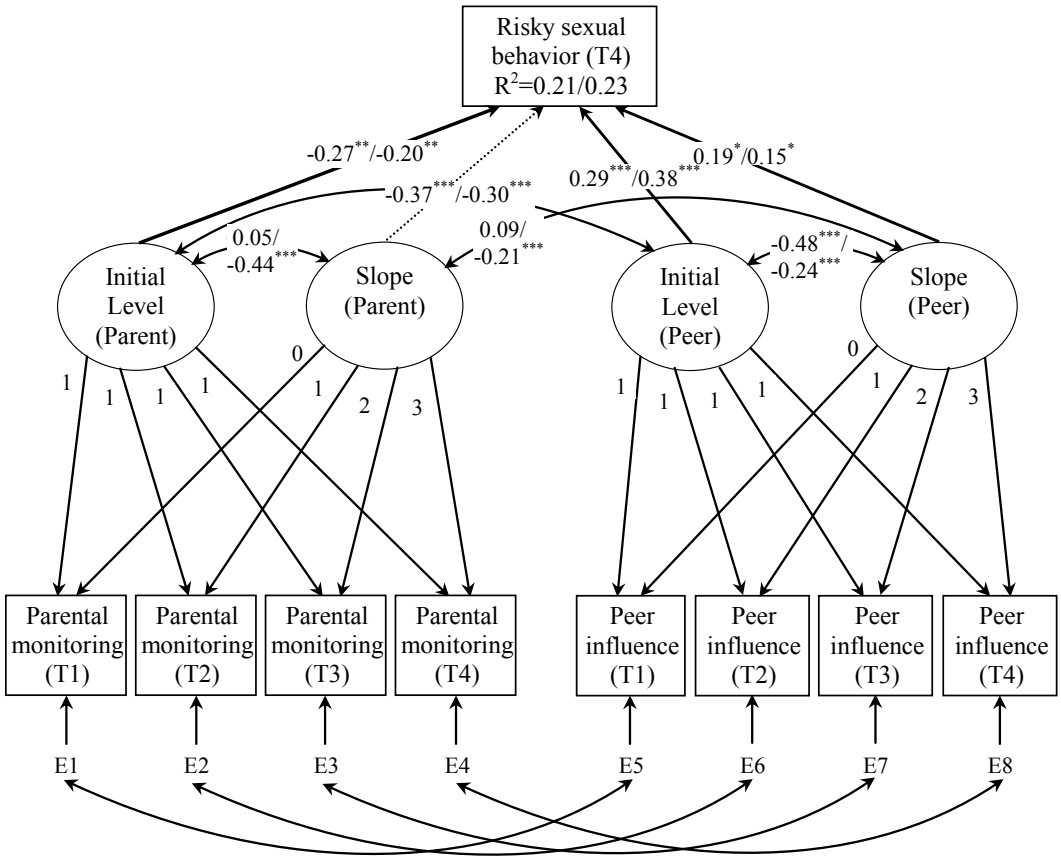
At baseline (Time 1), 99% of youth were of African descent, and the mean age of respondents was 14.5 years (range, 13–17 years). At Time 1, 30% of males and 16% of females reported having had sexual intercourse in the last six months; at Time 4, those figures were 46% and 34%, respectively (Table 1, page 92). The proportion of youth with multiple sex partners in the last six months increased among male youth (from 15% at baseline to 24% at Time 4), but re-

FIGURE 2. Reciprocal relationships between peer risk involvement, parental monitoring and risky sexual behavior among female adolescents



*p<.05. **p<.01. ***p<.001. *Notes:* T1=baseline; T2=6 mos.; T3=12 mos.; and T4=18 mos. Bold lines indicate significant paths.

FIGURE 3. Latent growth model with the outcome variable risky sexual behavior among male and female adolescents



Notes: Numbers before the slash are coefficients for male model and numbers after the slash are coefficients for female model. Bold lines with coefficients indicate significant paths. T1=baseline; T2=6 mos.; T3=12 mos.; and T4=18 mos. E1–E8 indicate error terms.

mained stable among females (3% and 5%, respectively); by contrast, the proportion who had consumed alcohol before having sex increased significantly among females (from 2% at baseline to 5% at Time 4), but not among males. The proportion of youth having had sex with a partner who was three or more years older increased from baseline to Time 4 for both males (from 7% to 13%) and females (from 9% to 15%). Differences across times in the proportion who reported not using a condom at last intercourse were not significant for either males (19–33%) or females (17–24%).

Perceived peer risk involvement (overall and specific risk behaviors) increased slightly but significantly for both male and female youth over the study period (from a mean score of 1.9 each at baseline to 2.0 each at Time 4). Parental monitoring decreased significantly for male youth (from 3.9 to 3.7), but remained stable for female youth. Parental knowledge, youth disclosure and parental control all decreased significantly by Time 4 among males; however, only parental control decreased among females.

Bivariate Correlations

Perceived peer risk involvement was negatively correlated with parental monitoring at each time point (coefficients, −0.26 to −0.33; Table 2, page 92) and across time points (−0.15 to −0.27); it was positively correlated with sexual risk behavior at each time (0.33–0.39) and across time points (0.29–0.36). Parental monitoring was negatively correlated with sexual risk behavior at each time (−0.25 to −0.31) and across times (−0.24 to −0.34). Age was positively correlated with sexual risk behavior at Times 1, 2 and 3 (0.09–0.12). Also, compared with male youth, females reported higher levels of parental monitoring (0.20–0.31) and lower levels of sexual risk involvement (−0.18 to −0.24) at all four times.

Structural Equation Models

The overall fit was acceptable for the full structural equation models for males (CFI=0.93, TLI=0.91, RMSEA=0.07, χ^2/df=2.49; Figure 1, page 93) and for females (CFI=0.95, TLI=0.93, RMSEA=0.06, χ^2/df=2.41; Figure 2, page 93). At baseline, perceived peer risk involvement was positively correlated with sexual risk behavior for males and females (coefficients, 0.57 and 0.39, respectively), and parental monitoring was negatively correlated with sexual risk behavior (−0.33 and −0.19). In addition, initial perceived peer risk involvement was negatively associated with initial parental monitoring for both genders (−0.49 and −0.51). The cross-lagged paths in both models showed that perceived peer risk involvement at Times 1, 2 and 3 predicted significantly

higher levels of sexual risk behavior at Times 2, 3 and 4, respectively (0.15–0.18 for males and 0.15–0.19 for females), whereas parental monitoring at Times 1, 2 and 3 predicted significantly (though modestly) lower levels of sexual risk behavior at Times 2, 3 and 4, respectively (−0.07 to −0.08 for males and −0.05 to −0.06 for females).

The reciprocal relationship held between parental monitoring and sexual risk behavior in the male youth model: Higher levels of sexual risk behavior at Times 1, 2 and 3 predicted modestly yet significantly lower levels of parental monitoring at Times 2, 3 and 4, respectively, even when controlling for peer risk involvement (−0.05 to −0.06). In the model for female youth, the reciprocal relationship held between peer risk involvement and sexual risk behavior: Higher levels of sexual risk behavior at Times 1, 2 and 3 predicted modestly but significantly increased levels of peer risk involvement at Times 2, 3 and 4, respectively, even when controlling for parental monitoring (0.06–0.07). The structural equation models account for 45% and 63% of the variance in sexual risk behavior at Time 4 among male and female youth, respectively.

Latent Growth Curve Model

The overall fit of this extended model was excellent for males (CFI=0.99, TLI=0.98, RMSEA=0.05, χ^2/df=1.97; Figure 3, page 94) and for females (CFI=0.99, TLI=0.99, RMSEA=0.03, χ^2/df=1.26). The latent growth curve models explain 21% and 23% of the variance in sexual risk behavior at Time 4 among male and female youth, respectively.

There were significant effects of the initial level of parental monitoring and the initial level and the growth rate of peer risk involvement on sexual risk behavior at Time 4. The initial level of parental monitoring had a protective effect for males and females (coefficients, −0.27 and −0.20, respectively), while the models for males and females showed risk-enhancing effects for the initial level of peer risk involvement (0.29 and 0.38) and the rate of increase in peer risk involvement (0.19 and 0.15). In addition, the initial level of parental monitoring was negatively correlated with initial level of peer risk involvement (−0.37 for males and −0.30 for females), which in turn was negatively correlated with the rate of increase in peer risk involvement (−0.48 for males and −0.24 for females). There were several differences between the male and female models: For female—but not male—youth, baseline parental monitoring was negatively correlated with the rate of increase in parental monitoring (−0.44), which in turn was negatively correlated with accelerated rate of increase in peer risk involvement (−0.21).

DISCUSSION

This study extends previous research by simultaneously examining reciprocal relationships between parental monitoring, perceived peer risk involvement and adolescent sexual risk behavior among mid-adolescent youth using longitudinal data. We found consistent evidence that peer influence is strongly related to sexual risk behavior of Bahamian youth, and that increased parental monitoring is moderately protective. This study demonstrated the presence of gender differences in the reciprocal relationships. Prospective reciprocal relationships were found between parental monitoring and sexual risk behavior for male adolescents, and between perceived peer risk involvement and sexual risk behavior for female adolescents. Perceived peer risk involvement had a strong influence on adolescents' sexual risk behavior; while it was also true that sexual risk behavior influenced perceived peer risk involvement for young women and parental monitoring for young men, these effects were more modest. Our research builds on previous work by examining the interrelationships between changes in peer risk involvement and parental monitoring, and the longitudinal effects of initial levels and rates of growth in perceived peer risk involvement and parental monitoring on adolescent sexual risk behavior. Increases in peer risk involvement predicted increases over time in sexual risk, and increased peer risk behavior predicted decreased parental monitoring (especially for females).

We found that among Bahamian youth, peer influence exerts a greater influence on sexual risk involvement than does parental monitoring, which is consistent with findings from a recent cross-sectional study among school adolescents in Ethiopia.[27] The relative importance of parental and peer influence on adolescent behavior changes over the course of adolescent development: As children reach adolescence, parental influence wanes, while peer relationships become increasingly important;[36] adolescents may turn to their peers for more specific information regarding sexual behavior. Our study participants may have been especially susceptible to peer influence because of their ages; a previous study found that peer influence peaks during mid-adolescence.[37]

Data from the present study indicate a reciprocal relationship between perceived peer risk involvement and sexual risk behavior among adolescent females in the Bahamas, but not among males. This finding is consistent with previous work that found stronger associations between peer and individual sexual behavior among females than among males.[28] We speculate that this may, in part, be because of the persistently high levels of parental monitoring experienced by adolescent females in this context.[36] It is also possible that female adolescents who engage in sexual risk behavior are more likely than their male counterparts to socialize with friends who have similar sexual attitudes and behaviors.[33]

By contrast, a reciprocal relationship was found between parental monitoring and sexual risk behavior among male—but not female—youth in the Bahamas. This finding is consistent with a recent study of parenting in the Caribbean that found that a higher proportion of male adolescents than of female adolescents report neglectful parenting.[26] Parental monitoring may prevent adolescents from acting on their intentions, by reducing the opportunity to engage in sexual risk behavior or restricting their contacts with high-risk peers.[41] At the same time, adoles-

cent males' engagement in sexual risk behaviors may lead parents to be less involved and engaged with their youth,[20] or cause parents to withdraw their monitoring efforts to avoid conflict with their adolescent sons.[3] It is also possible that adolescent males who engage in risky behavior may subsequently be more likely to act covertly and be less likely to share information with parents. This pathway of influence from female adolescents to parents was not significant after accounting for peer influence, perhaps because parental monitoring remained relatively steady for female adolescents during the study period, or because peer relationships are more important for females than males during middle adolescence.

Our data are not fully consistent with previous studies that report that the level of parental monitoring and supervision decreases as children age.[48] According to our findings, perceived parental monitoring decreased for male adolescents, but remained steady for females during high school. Results from our previous studies among grade-six youth in the Bahamas suggest that perceived parental monitoring is fairly steady across junior high school for both male and female youth, although the level of parental monitoring among females was consistently higher than that among males.[49] Parents may maintain consistent and higher levels of parental monitoring of female adolescents into high school because they perceive the potential costs of sex (e.g., pregnancy and STIs) to be greater for females than for males.[33]

Our examination of interrelationships among changes in peer risk involvement and parental monitoring indicates that early level of parental monitoring is negatively associated with early level of perceived peer risk involvement, and that the rate of increase in parental monitoring is negatively associated with the rate of increase in perceived peer risk involvement (for female youth). The negative association between parental monitoring and perceived peer risk involvement may indicate that parents can limit their adolescents' contact with high-risk peers or affect adolescents' perceptions and intentions regarding sexual behavior.[41] The results of our extended latent growth curve models, consistent with the findings from the structural equation modeling analysis, suggest that an accelerated growth rate of perceived peer risk involvement significantly contributes to increased sexual risk behaviors.

Strengths and Limitations

Several limitations of the present study should be noted. First, measures of sexual activity relied on adolescents' self-reports, and thus, risky sexual behaviors may have been misreported or underreported because of social desirability or recall bias. Second, in developing the composite score of sexual risk involvement, we followed the literature in assigning the same weight to all risky sexual behaviors,[45] although arguably some behaviors may be associated with a higher risk of infection with HIV or other STIs. Finally, the measure of peer risk involvement relied on study participants' perceptions of the behavior of their peers, and it is possible that adolescents may have inaccurately characterized their friends' behavior. However, previous research on peer influence suggests that perceived peer behavior is more important than actual peer behavior in predicting adolescent risk behavior.[50] The strengths of this study include the use of longitudinal data, and the application of structural equation modeling and latent growth curve modeling for examination of the concurrent, reciprocal and prospective relationships of parental monitoring, peer influence and adolescent sexual risk engagement.

CONCLUSIONS

Results from this study contribute to our understanding of reciprocal relationships between parenting, peer influence and adolescent sexual risk involvement. They suggest that the effectiveness of adolescent sexual risk reduction interventions may benefit from the inclusion of adolescents' friends and parents, and from stressing the importance of correcting adolescents' misperception of high peer risk involvement by providing relevant survey data, especially to female adolescents.

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RESUMEN

Contexto: *Una cantidad considerable de investigaciones han examinado las relaciones recíprocas entre la influencia de los padres y de los pares con el comportamiento problemático en adolescentes; sin embargo, dichos estudios han considerado en gran parte la influencia de los pares y de los padres de forma separada. Es importante examinar simultáneamente las relaciones entre el monitoreo de los padres, la participación de los pares en la toma de riesgos y la conducta sexual de riesgo en adolescentes; y si el aumento en la toma de riesgos de los pares y los cambios en el monitoreo de los padres predicen longitudi-*

nalmente la conducta sexual de riesgo en adolescentes.
Métodos: *Se recolectaron cuatro olas de datos sobre las conductas sexuales de estudiantes de nivel de educación media de entre 13 y 17 años de edad en las Bahamas a lo largo de un período de dos años. Se usaron modelos de ecuación estructural y de curva de crecimiento latente para examinar las relaciones recíprocas entre el monitoreo de los padres, la toma de riesgos percibida de los pares y la conducta sexual de riesgo en adolescentes.*
Resultados: *Tanto para hombres como para mujeres jóvenes, una mayor toma de riesgos percibida de los pares predijo puntajes más altos en el índice de conducta sexual de riesgo, mientras que un mayor monitoreo de los padres predijo puntajes más bajos. Se encontraron relaciones recíprocas entre el monitoreo parental y las conductas sexuales de riesgo en hombres y entre la toma de riesgos percibida de los pares y las conductas sexuales de riesgo en mujeres. En el caso de los hombres, una mayor conducta sexual de riesgo predijo un menor monitoreo de los padres; en las mujeres, una mayor conducta sexual de riesgo predijo una mayor toma de riesgos percibida de los pares. Según los modelos de curva de crecimiento latente, un mayor nivel inicial de monitoreo de los padres predijo disminuciones en la conducta sexual de riesgo, mientras que tanto un nivel inicial alto así como la tasa de crecimiento de la toma de riesgos de los pares predijo aumentos en la conducta sexual de riesgo.*
Conclusión: *Los resultados destacan la importante influencia de la toma de riesgos de los pares en la conducta sexual de los jóvenes, así como las diferencias de género en las relaciones recíprocas entre el monitoreo de los padres, la influencia de los pares y la conducta sexual de riesgo en adolescentes.*

RÉSUMÉ

Contexte: *La recherche a examiné les rapports réciproques entre l'approche parentale, l'influence des pairs et les comportements adolescents à problèmes, considérant souvent toutefois les deux premiers facteurs séparément. Il importe d'examiner simultanément les rapports entre la surveillance parentale, l'engagement des pairs dans des activités à risques et le comportement sexuel à risques des adolescents, de même que si l'accroissement de cet engagement des pairs et la variation de la surveillance parentale sont longitudinalement prédicteurs de ce comportement sexuel.*
Méthodes: *Quatre vagues de données sur le comportement sexuel ont été collectées sur une période de deux ans auprès de jeunes lycéens âgés de 13 à 17 ans aux Bahamas. La modélisation par équation structurelle et courbe de croissance latente a servi à examiner les rapports réciproques entre la surveillance parentale, l'engagement perçu des pairs dans des activités à risques et le comportement sexuel à risques des adolescents.*
Résultats: *Pour les jeunes des deux sexes, le plus grand engagement perçu des pairs dans des activités à risques s'est révélé prédicteur de plus hauts scores indiciels de comportement sexuel à risques et une surveillance parentale plus stricte, de moindres scores. Des rapports réciproques ont été observés entre la surveillance parentale et le comportement sexuel à risques chez les garçons, et entre l'engagement à risques perçu des pairs et le comportement sexuel à risques chez les filles. Côté masculin, un comportement sexuel à risques plus prononcé était prédicteur d'une moindre surveillance parentale; côté féminin, il l'était d'un plus grand engagement perçu des pairs dans des activités à risques. Selon les modèles à courbe de croissance latente, un plus haut niveau initial de surveillance parentale était prédicteur de moindres niveaux de comportement sexuel à risques, alors qu'un niveau initial supérieur et un taux de croissance plus élevé de l'engagement à risques des pairs l'étaient d'une hausse du comportement sexuel à risques.*
Conclusion: *Les résultats soulignent l'importante influence de l'engagement perçu des pairs dans des activités à risques sur le comportement sexuel des jeunes et les différences de genre dans les rapports réciproques entre la surveillance parentale, l'influence des pairs et le comportement sexuel à risques des adolescents.*

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