



Hanging Out With the Wrong Crowd: How Much Difference Can Parents Make in an Urban Environment?

Jacqueline J. Lloyd and James C. Anthony

ABSTRACT *This longitudinal study of youths growing up in an urban area tests whether and by how much increased levels of supervision and monitoring by parents might influence levels of affiliation with delinquent and deviant peers—possibly our most sturdily replicated proximal determinant of early-onset illegal drug use and associated conduct problems in adolescence, aside from aggression and rule-breaking in childhood. Standardized interviews were used to assess parenting, affiliation with deviant peers, and other characteristics of the urban-dwelling youths in this epidemiologically defined sample (>70% African American heritage). Longitudinal analyses and generalized estimating equation (GEE) methods were used to estimate prospective relationships across the transition from late childhood into early adolescence. Results from the longitudinal analyses showed that higher levels of monitoring signaled later lower levels of affiliation with deviant peers, even with statistical adjustment for multiple covariates ($\beta = -0.04$; 95% confidence interval [CI] = -0.07 to -0.02 ; $P = .001$). Closer parental supervision at ages 8–9 years was linked to subsequently lower levels of deviant peer affiliation ($\beta = -0.05$; 95% CI = -0.08 to -0.01), and subsequent age-associated increases in levels of parental supervision from year to year were followed by decreases in levels of affiliation with deviant peers ($\beta = -0.12$; 95% CI = -0.15 to -0.09). The main evidence from this study indicates that maintenance of parental supervision and monitoring through the transition from childhood to adolescence may yield important reductions in levels of affiliation with deviant peers, even in the context of our urban and sometimes socially disadvantaged community environments.*

KEYWORDS *Adolescence, Deviant peer affiliation, Parent monitoring, Urban.*

INTRODUCTION

This longitudinal research with an urban and predominantly African American epidemiologic sample is motivated by a widely shared concern about what happens when young people start hanging out with the wrong crowd. For example, the prevalence and risk of illegal drug use are found to depend on levels of affiliation with delinquent and otherwise deviant peers. The same appears to be true for other risk-laden behaviors and conduct problems.^{1–7}

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As an aid to understanding the development of drug use and related problem behaviors in childhood and adolescence, Patterson and colleagues⁵ suggested a social context model in which the problem behavior is shaped by proximal peer influences (e.g., social modeling and reinforcement of rule breaking). But origins of this untoward peer influence and the observed affiliation with rule breaking or deviant peers can be traced to suboptimal parenting practices, especially unsatisfactory shaping of coercive interactional processes within the family, and inept parental supervision and monitoring of the youth.

Evidence consistent with the social context model has been presented by Dishion et al.,^{7,8} Metzler et al.,⁹ Duncan and others,¹⁰ but most research on this topic is cross sectional with mainly Caucasian samples. A special exception is prospective research by Chilcoat and colleagues,^{11,12} who found that risk of starting to use drugs was lower for children who had previously experienced higher levels of supervision and monitoring—whether the parental monitoring was measured by child report or by parent report.

The main purpose of the present investigation is to sharpen the focus on the dual questions of whether and by how much supervision and monitoring by parents can make a difference in youth peer affiliations for young people growing up in an urban area. The young people under study represent the same restricted longitudinal urban sample of young people described in prior research articles (e.g., Chilcoat et al.,¹¹ Kellam and Anthony¹³). However, in a shift from our research group's prior focus on illegal drug use and other related problem behaviors, we now are studying an intermediate step in the social context model outlined by Patterson and colleagues.⁵

Using longitudinal methods, we seek to estimate the relationships that link earlier supervision and monitoring by parents to the children's later levels of affiliation with delinquent and otherwise deviant peers. In so doing, we hope to add new evidence on the question posed in the title to this article: With respect to the child's affiliation with deviant peers, how much difference can parents make in an urban environment? There is very limited evidence on these topics with respect to minority and sometimes socially disadvantaged subgroups living in urban areas of America and elsewhere around the globe.

This study attempts to address current gaps in evidence by testing three hypotheses: (1) that increased levels of parental monitoring are associated with decreased levels of deviant peer affiliation (DPA), (2) that the influence of earlier levels of parental monitoring (e.g., at child's age 8–9 years) might wane over time with respect to later DPA levels (e.g., by child's age 12–13 years), and (3) that over time changes in levels of parental monitoring might induce changes in levels of DPA. Specifically, we anticipate evidence that relaxation of levels of parental monitoring and supervision is followed by increased levels of child affiliation with deviant peers, even when the relaxation is modest and normative by community standards.

In this respect, we look across the broad range of levels of parental supervision and monitoring in the urban community environment, with no exclusion of or focus on actionable child neglect, which has not been measured in this research. Consistent with the social context model offered by Patterson and colleagues, we take into consideration the possible influence of individual, family, and neighborhood characteristics. In exploratory analyses, we consider the possibility that the relationship between parental monitoring and DPA might be different for boys compared to girls.

METHODS

Study Population and Data

This study builds from a program of epidemiology and prevention research initiated by Professors Sheppard Kellam, James C. Anthony, and their colleagues at the Prevention Research Center of Johns Hopkins University School of Hygiene and Public Health (Baltimore, MD), with research design and methods as described by Kellam and Anthony,¹³ Kellam et al.,¹⁴ and later collaborators who joined the research team (e.g., Chilcoat et al.,¹¹ Hunter et al.,¹⁵ Ialongo et al.¹⁶). Approval for the conduct of this study was received from the Johns Hopkins University Institutional Review Board (IRB).

The study population was designated to include all first graders entering 19 public elementary schools of a single school system during two successive school years (cohort 1 entering in 1985 and cohort 2 entering in 1986). All of these first graders were residents of urban neighborhoods within the catchment area of this school system, which is located in the mid-Atlantic United States.

In the present study, we define the study population of interest as youths who are growing up in city neighborhoods and going to school in the same school system where they started first grade. The rationale for this restriction of range to youths growing up and going to school in the same urban community has been the topic of a series of books and articles by Kellam and colleagues.^{14,17-19} These concepts resonate with concepts of ecology, where there sometimes is scientific advantage gained by narrowing the research focus on specific ecological niches and the occupants of these niches.

The original research design was that of a randomized prevention trial nested within a prospective and longitudinal study. The design involved random assignment and standardized assessment of all children in cohorts 1 and 2, with 20%–25% assigned to a behaviorally oriented Good Behavior Game classroom intervention, 20%–25% assigned to an academically oriented Mastery Learning classroom intervention, and the remainder assigned to the usual and customary classroom conditions (see Kellam and Anthony¹³).

Under these circumstances, about 5%–10% of eligible first graders were not enrolled in the study (e.g., because parental consent was not granted for the random assignment), which included standardized teacher ratings of rule breaking and other aggressive behavior during the first months of primary school. A total of 2,128 first graders were enrolled and were assessed with the full teacher rating assessment protocol (a subset of 2,311 students in the study base).

By design, in successive years assessment resources were allocated to youths who remained as residents of the same urban catchment area and who continued to be enrolled as students in the same urban public school system. Starting in spring 1989, under a National Institute on Drug Abuse (NIDA) award to one of the authors (J. C. A.), it was possible to amend the assessment protocol to include direct face-to-face interviewing under private conditions. Virtually all of the students who remained in this urban school system were interviewed at that time, when most cohort 1 students were completing grade 4, and most cohort 2 students were completing grade 3 ($n = 1,720$).

Each year from 1989 through 1993, the interview assessment was repeated. Year-to-year variation in the number of students interviewed depended mainly on the number of assessment sessions allowed by the school system each spring. For

example, in 1990, the number of assessment sessions was curtailed by an unexpected week of standardized achievement test days and by weather-related closing of the schools, which were not air conditioned. In that year, it was possible to interview only 1,300 of the eligible students. (None of the eligible children refused to be interviewed in 1989, and each year from 1990 to 1994, there were fewer than 10 refusals.)

In 1994, the plan was to focus all of the assessment resources on the cohort 2 students who remained in the school system (about 50% of the starting cohort 2 sample size of 1,115 first graders), with cohort 1 students interviewed only when no cohort 2 assignments were available. The focus of interviewing resources on cohort 2 in 1994 is reflected in Table 1 (time point 6 column), which shows that only 906 students were interviewed that year (most of them were cohort 2 participants). The longitudinal generalized linear model and the method of generalized estimating equation (GLM/GEE) methods described below make it possible for us to use all available information from these several years of assessment rather than impose a restriction to participants with 100% complete data, as would be required for standard multivariate analyses of variance (e.g., see Diggle et al.²⁰).

Assessment of the Response Variable

The primary response construct in this investigation is the level of DPA, as measured by five standardized, preworded, and precoded interview questions posed to

TABLE 1. Description of the sample under study

	Time 1 1989 (n = 1,720)		Time 2 1990 (n = 1,300)		Time 3 1991 (n = 1,648)		Time 4 1992 (n = 1,416)		Time 5 1993 (n = 1,501)		Time 6 1994 (n = 906)*	
Age, mean range in years	8–9		9–10		10–11		11–12		12–13		13–14	
	n	%	n	%	n	%	n	%	n	%	n	%
Sex												
Female	860	50.0	673	51.8	842	51.1	722	51.0	780	52.0	465	51.3
Male	860	50.0	627	48.2	806	48.9	694	49.0	721	48.0	441	48.7
Race												
Black (not Hispanic)	1,255	73.0	989	76.1	1,256	76.2	1,111	78.5	1,193	79.5	734	81.0
White and all others	465	27.0	311	23.9	392	23.8	305	21.5	308	20.5	172	19.0
Intervention group												
Standard/control setting	984	57.2	713	54.8	934	56.7	797	56.3	852	56.8	518	57.2
Mastery learning Good behavior game	378	22.0	309	23.8	360	21.8	306	21.6	328	21.8	205	22.6
Good behavior game	358	20.8	278	21.4	354	21.5	313	22.1	321	21.4	183	20.2

Source: Data from Johns Hopkins Prevention Research Center based on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.

*The sample includes youth from two cohorts (1 and 2). In 1994 the sample was restricted to cohort 2 primarily, as part of the study design.

each youth during the interview assessment session each spring from 1989 to 1994. All five items were drawn from the Peer Behavior Scale published by the Oregon Social Learning Center (OSLC),²¹ with adaptation for age appropriateness as described previously.²¹ These five items measure affiliation with friends who participate in deviant behaviors such as cheating on school tests, stealing, and hitting or threatening to hit someone for no reason.

Assessment of Parental Supervision and Monitoring

Of primary interest as a determinant of deviant peer affiliation in this study is the OSLC construct termed parent monitoring (PM). Parent monitoring corresponds with the level of a parent's or guardian's surveillance and control over the child's environment and includes rules about the whereabouts of the child, friendships, and latchkey-type characteristics such as whether a responsible adult is present when the child returns home at the end of the school day. For this study, parent monitoring was measured by 10 standardized, preworded, and precoded interview questions posed to each youth during the interview assessment session each spring from 1989 to 1994, as described elsewhere.¹² All 10 items were drawn from the Parent Monitoring Scale published by the Oregon Social Learning Center, with adaptation for age appropriateness.²¹

Other Covariates

The relationships linking earlier levels of parental monitoring with later levels of deviant peer affiliation were estimated within the context of a general conceptual model for deviant peer affiliation. Key covariates included within this conceptual model encompassed basic sociodemographic characteristics (age, sex, race), with measures derived from school administrative records abstracted early in the study, as well as information on family composition and socioeconomic status gathered via standardized survey assessments during early telephone interviews with parents or guardians. Also included in the conceptual model were three additional constructs thought important in the formation of deviant peer relationships: early aggression, self-derogation, and academic self-competence.

Early Aggression When estimating the relationships linking PM to later DPA, we sought to constrain the possibly confounding influence of the child's tendencies toward deviant and rule-breaking behavior, which might influence both level of affiliation with deviant peers and levels of parental supervision and monitoring. In this study, it was possible to take advantage of the standardized teacher rating protocol used for the randomized preventive trial and to measure the child's tendencies toward rule-breaking behavior on the basis of the grade 1 teacher ratings of first graders' behavior as observed in the classroom during the first weeks after school entry. This measurement, known as the Teacher Observation of Classroom Adaptation–Revised (TOCA-R), has been described by Werthamer-Larsson and colleagues.^{22,23}

Neighborhood Advantage We considered the possibility that level of neighborhood advantage might function as an important determinant or confounding variable during estimation of the relationship between parent monitoring and deviant peer affiliation. In this study, level of neighborhood advantage was measured using 18 items drawn from a scale originally developed by Elliott and colleagues²⁴ and

adapted by Samuels, Wood, and Anthony for age-appropriateness and the urban context of this study as described by Crum et al.²⁵

Self-Derogation Kaplan's theory links self-derogation with levels of deviant peer affiliation,²⁶ and for this study we drew on items included in the Kaplan Self-Derogation Scale, with adaptation to make the seven items more appropriate for primary school students.²⁶

Academic Self-Competence Elaborated by Harter²⁷ as a special facet of self-esteem, the academic self-competence construct encompasses children's self-perceptions about how well they are doing in school-related academic tasks. This construct has been measured in this study using six items drawn from Harter's Scholastic Competence subscale.

Other Facets of Parenting The youth interview in 1989 also included scales analogous to the one used to assess parent monitoring, but designed to tap other potentially important facets of parenting, such as parental discipline, parental involvement in the youth's activities, and parental reinforcement of prosocial behaviors. The items for these constructs were drawn from the corresponding scales published by Capaldi and Patterson.²¹

Total scores were created for all scale measures (deviant peer affiliation, parental monitoring, self-competence, self-derogation, neighborhood advantage, first-grade aggressive behavior, parental reinforcement, parental involvement, and parental discipline). To address concerns about the potential for collinearity among covariates and to aid interpretation of estimates, scale scores were centered from the sample mean by subtracting the sample mean score from each individual total scale score. Individual total scale scores for first-grade aggressive behavior were centered from the cohort mean rather than the sample mean to address metrics used to measure first-grade aggressive behavior.

Data Analysis

Multiple linear regression analyses with the generalized linear model and the method of generalized estimating equation (GLM/GEE) were used to estimate time series relationships between levels of parental monitoring and levels of deviant peer affiliation across the six longitudinal observations of this study. The GLM/GEE methods yield population-averaged estimates accounting for within-subject interdependencies of the repeated measures, expressed in the following form²⁰:

$$Y_{ij} = \beta_0 + \beta_1 X_{ij} \dots + \beta_n X_{ij} + \epsilon_{ij}$$

where β_0 is the mean intercept for the sample at baseline levels of covariates and at zero values of dummy-coded indicator terms (e.g., for sex of the child and race/ethnicity or minority status). The terms $\beta_1 \dots \beta_n$ correspond with the population-averaged slope estimates, which describe how the response depends on each covariate X . The term ϵ_{ij} is the error term for each subject i at timepoint j .

The crude prospective bivariate relationship linking parent monitoring to deviant peer affiliation was estimated first. Then, the regression models were elaborated to make statistical adjustments for covariates suspected to distort the relationship. Prospective estimates were based on time-lagged observations of DPA level for a

given year on PM levels for the prior year (i.e., DPA level for $j = 2$ regressed on PM level for $j = 1$).

Subsequent analyses were conducted to evaluate whether baseline level of parental monitoring (measured in 1989 when the children in the sample were 8–9 years old) might influence later levels of DPA. The estimation procedure involves a starting model with a “common slope” estimate that summarizes information borrowed across all years of DPA levels, regressed on the baseline parent monitoring level. This was a model of no waning influence. This starting model was followed by simultaneous estimation of time-specific slopes in a regression of each year’s DPA level on the baseline level of parental monitoring. Next, analyses were conducted to test whether changes in levels of parental monitoring over the 6-year study period might influence changes in levels of DPA during the observation interval. Similar to the estimation procedures just described, a model of no waning influence was estimated first, followed by a simultaneous estimation of time-specific slopes.

After primary estimation, exploratory analyses were performed to test for subgroup variation in the relationships between parental monitoring and DPA, with male-female differences of central interest (e.g., see Ensminger et al.²⁸ and Khoury²⁹). For all GLM/GEE analyses, the robust variance estimation procedure was applied with the “exchangeable” correlation structure. The robust estimator method produces valid approximations of the standard errors even when the correlation structure is not correctly specified.³⁰ These multivariate analyses were performed using Stata 6.0 (StataCorp).³¹

RESULTS

Table 1 offers a description of the study sample. For example, the mean age of the study sample was 8–9 years in 1989 and 13–14 years in 1994, with generally balanced male-female ratios. In 1989, the sample was 73% black ($n = 1,255$) compared with 27% white and all others ($n = 465$). An estimated 30.9% of the sample resided in two-parent (mother and father) families, 34.2% in mother-only families, and 34.9% in other family structures (i.e., mother and grandmother, etc.) (data not shown). With respect to socioeconomic status, 32.1% of the sample qualified as lower income, 39.1% as medium income, and 28.8% as higher income (data not shown).

Table 2 provides mean deviant peer affiliation and parent monitoring scores by year for the total sample as well as for boys and girls separately. The mean DPA scores for the total sample ranged from 9.5 to 11.1 across the years ($SD = 3.8$ – 4.1). Overall, the scores were slightly higher for boys compared with girls. As in the total sample, DPA scores did not appear to vary much over the 6-year observation interval for boys or girls. The mean parental monitoring scores ranged from 32.2 to 33.6 for the total sample ($SD = 5.0$ – 5.3), and the mean scores were slightly higher for girls compared with boys overall. At the margin, parental monitoring scores did not vary much over the 6-year period, in both the total sample and for boys and girls separately (Table 2).

Results from the GLM/GEE analysis of the data are presented in Table 3. The overall crude summary estimate linking levels of parent monitoring with levels of deviant peer affiliation is -0.07 ($\beta = -0.07$; 95% CI = -0.09 to -0.05 ; $P < .001$) (see footnote in Table 3). The results presented in Table 3 depict how this summary estimate changes with increasing elaboration of the model to include multiple co-

TABLE 2. Mean scores for levels of parent monitoring and deviant peer affiliation by year of the study and for males and females in the sample

	Time point	n	Total sample		Females		Males	
			Mean	(SD)	Mean	(SD)	Mean	(SD)
Deviant peer affiliation	1	1,713	11.1	(3.9)	10.9	(3.8)	11.3	(3.9)
	2	1,294	9.5	(3.8)	9.7	(3.6)	10.2	(3.9)
	3	1,648	10.4	(3.9)	10.0	(3.8)	10.8	(4.0)
	4	1,416	10.6	(3.9)	10.0	(3.8)	11.2	(3.9)
	5	1,501	11.0	(3.9)	10.6	(3.8)	11.5	(4.1)
	6	906	11.0	(4.1)	10.7	(4.1)	11.3	(4.1)
Parent monitoring	1	1,664	32.2	(5.2)	32.9	(4.8)	31.5	(5.4)
	2	1,247	33.6	(5.3)	34.4	(4.8)	32.8	(5.6)
	3	1,647	33.4	(5.0)	34.6	(4.8)	32.2	(4.9)
	4	1,415	33.1	(5.1)	34.2	(4.7)	31.9	(5.2)
	5	1,499	32.8	(5.1)	33.9	(4.7)	31.6	(5.1)
	6	906	33.2	(5.3)	34.3	(4.8)	32.1	(5.5)

Source: Data from Johns Hopkins Prevention Research Center based on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.

variates. With the addition of a broad array of covariates, the relationship remains inverse and modest. That is, higher levels of parent monitoring are associated with modestly lower levels of deviant peer affiliation. For every unit increase in the parent monitoring score, there is an estimated corresponding 4% reduction in the level of deviant peer affiliation ($\beta = -0.04$; 95% CI = -0.07 to -0.02 ; $P = .001$).

Under the adjusted model presented in Table 3, the following covariates were found to have independent predictive associations with later increasing levels of deviant peer affiliation: increasing age, sex (i.e., male-female difference), race/ethnicity, family socioeconomic level (i.e., being poorer), levels of neighborhood advantage, and early aggressive behavior ($P < .05$; Table 3). Levels of deviant peer affiliation were not found to be associated with early intervention status (i.e., Mastery Learning vs. Good Behavior Game vs. Standard Setting control), self-derogation, academic self-competence, or family composition (i.e., living in a mother-only family) ($P > .10$ for these variables). When the model was further extended to include other facets of parenting such as discipline, involvement of the parent in youth's activities, and parental reinforcement of prosocial behavior, these other domains of parenting were not found to be associated with deviant peer affiliation ($P > .10$ for all three domains) (data not shown).

The GLM/GEE models were respecified to address whether parent monitoring levels observed at age 8–9 years might have a waning influence on subsequent levels of deviant peer affiliation. Under the common slope model, which summarizes information borrowed across all years of deviant peer affiliation levels regressed on parent monitoring levels, a higher baseline level of parent monitoring when the children were 8–9 years old was associated with a lower level of deviant peer affiliation (common slope estimate, $\beta = -0.05$; 95% CI = -0.08 to -0.01 ; Table 4).

Visual inspection of the time-specific slope estimates shown in Table 4 and Figure 1 shows no apparent waning of the influence of baseline levels of parent monitoring (measured in time point 1, when the youths were 8–9 years old) on

TABLE 3. Estimated relationship between levels of parent monitoring (PM) and levels of deviant peer affiliation (DPA)*

	Adjusted model†		
	β	95% CI	<i>P</i>
Parent monitoring	-0.04	(-0.07 to -0.02)	.001
Sex			
Female	1.00	Reference	
Male	0.66	(0.27 to 1.06)	.001
Age, years	0.41	(0.17 to 0.65)	.001
Race			
Black	1.00	Reference	
White and others	-0.48	(-0.96 to -0.01)	.049
Intervention group			
Standard/control group	1.00	Reference	
Mastery Learning	-0.26	(-0.70 to 0.18)	.251
Good Behavior Game	-0.25	(-0.71 to 0.20)	.276
Self-derogation level	0.08	(-0.04 to 0.19)	.194
Academic self-competence level	-0.04	(-0.09 to 0.01)	1.66
Level of neighborhood advantage	-0.19	(-0.24 to -0.14)	<.001
Level of first-grade aggressive behavior	0.06	(0.03 to 0.09)	<.001
Family composition			
Living with mother and father	1.00	Reference	
Living with mother only	0.24	(-0.32 to 0.81)	.400
Living with other caretakers	0.08	(-0.41 to 0.58)	.740
Level of family income	-0.15	(-0.28 to -0.02)	.026

Source: Data from Johns Hopkins Prevention Research Center based on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.

Crude or unadjusted slope estimates from regression of DPA level on PM level: $\beta = -0.07$; 95% confidence interval (CI) = -0.09 to -0.05; $P = <.001$.

*Slope estimates from regression of DPA levels on PM levels obtained from generalized linear model and the method of generalized estimating equation (GLM/GEE) analyses using the robust estimator method and exchangeable correlation structure.

†Adjusted slope estimates from regression of DPA level on PM level estimated under the GLM/GEE model with all listed covariates plus terms for year of assessment to capture ambient time trends not subsumed by child's increasing age.

levels of deviant peer affiliation over the subsequent three time points (time points 2–4, when the youths were 9–12 years old). Whereas the smaller point estimates for time points 5 and 6 may suggest a waning influence (when the youths were aged 12–14 years), in fact the common slope estimate serves well in this context, as indicated by the width of the confidence intervals. Hence, parent monitoring in place when children are 8–9 years old may have a sustained, albeit modest, influence on deviant peer affiliation for several years.

An additional respecification of the GLM/GEE models provided a means of evaluating the degree to which change in levels of parent monitoring might be followed by change in levels of deviant peer affiliation. With the influence of baseline parent monitoring held constant, we found that for every unit increase in level of

TABLE 4. Estimates to assess the possibly waning influence of baseline level of parent monitoring (PM) on later levels of deviant peer affiliation (DPA)*

	Time point (mean age)	β	95% Confidence intervals
Common slope model [†]	Summarized for time points 2–6	-0.05	(-0.08 to -0.01)
Time-specific slope model	2 (9–10 years)	-1.12	(-1.42 to -0.82)
	3 (10–11 years)	-0.98	(-1.30 to -0.66)
	4 (11–12 years)	-0.56	(-0.92 to -0.21)
	5 (12–13 years)	-0.12	(-0.50 to 0.24)
	6 (13–14 years)	-0.19	(-0.62 to 0.24)

Source: Data from Johns Hopkins Prevention Research Center based on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.

* β and 95% confidence interval estimates based on generalized linear model and the method of generalized estimating equation (GLM/GEE) analyses using the robust estimator method and the exchangeable correlation structure with adjustments for age, sex, race, intervention group, scholastic competence, self-derogation, level of neighborhood advantage, level of first-grade aggressive behavior, family composition, and level of household income. For baseline, time = 1.

[†]Estimated as common slope under model of no waning influence to summarize influence of baseline levels of parent monitoring on subsequent levels of deviant peer affiliation.

parent monitoring from year to year, there is an estimated 12% reduction in level of deviant peer affiliation ($\beta = -0.12$; 95% CI = -0.15 to -0.09 ; Table 5). The estimates from the time-specific slope model support the idea that reductions in levels of PM during the early adolescent years (ages 9 to 10, 10 to 11, 11 to 12 years) may be more influential with respect to later increases in levels of DPA. For example, a

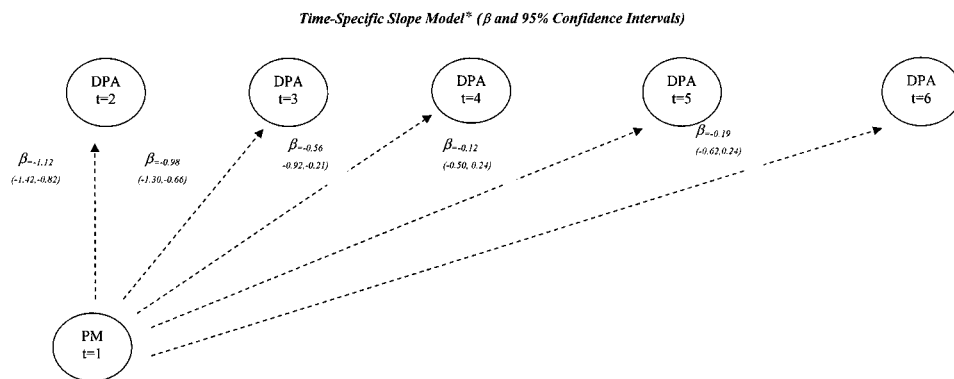


FIGURE 1. Estimates to assess the possibly waning influence of baseline level of parent monitoring (PM) on later levels of deviant peer affiliation (DPA). (Data from Johns Hopkins Prevention Research Center on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.) *Estimates for each time point t ($t = 1$ through $t = 6$). Estimates are anchored in relation to age. The median age at $t = 1$ was 8–9 years, at $t = 2$ was 9–10 years, at $t = 3$ was 10–11 years, at $t = 4$ was 11–12 years, at $t = 5$ was 12–13 years, and at $t = 6$ was 13–14 years.

TABLE 5. Estimates to assess whether change in level of parent monitoring (PM)* from one time point to another might be followed by change in level of deviant peer affiliation (DPA)† for the corresponding time points‡

	Change across time points (mean age)	β	95% Confidence intervals
Common slope model§	Summarized across time points	-0.12	(-0.15 to -0.09)
Time-specific slope model	1 to 2 (9 to 10 years)	-0.16	(-0.22 to -0.10)
	2 to 3 (10 to 11 years)	-0.97	(-1.25 to -0.70)
	3 to 4 (11 to 12 years)	-0.78	(-1.06 to -0.50)
	4 to 5 (12 to 13 years)	-0.53	(-0.82 to -0.24)
	5 to 6 (13 to 14 years)	-0.10	(-0.40 to 0.19)

Source: Data from the Johns Hopkins Prevention Research Center based on two cohorts of first-grade students followed and assessed each year between 1989 and 1994.

*Change in parent monitoring = $PM_{time=n} - PM_{time=n-1}$.

†Change in deviant peer affiliation = $DPA_{time=n} - DPA_{time=n-1}$.

‡Estimates based on generalized linear model and the method of generalized estimating equation (GLM/GEE) analyses using the robust estimator method and the exchangeable correlation structure with adjustments for baseline level of parent monitoring (PM_{t-1}), age, sex, race, intervention group, scholastic competence, self-derogation, level of neighborhood advantage, level of first-grade aggressive behavior, family composition, and household income.

§Estimates from the common slope model of no waning influence to summarize dependence of change in DPA level on change in PM level.

1-unit PM increase from age 10 to 11 years (time points 2 to 3) is associated with a 0.97-unit decrease in the level of DPA for the corresponding time points. In contrast, from age 12 to 13 years (time points 4 to 5), a 1-unit increase in level of PM is associated with a 53% decrease in level of DPA (Table 5, Fig. 2).

Males had higher levels of deviant peer affiliation compared to females, even with statistical adjustment for multiple covariates (see Table 3). With respect to male-female differences in the size of the PM-DPA relationship, a product term used to specify a male-female difference in slope proved to be inconsequential when added to the adjusted model presented in Table 3 ($P = .207$; data not shown).

DISCUSSION

The main findings from this longitudinal study may be summarized succinctly. First, there is evidence of a sustained inverse relationship between levels of parent monitoring and levels of deviant peer affiliation in this urban-dwelling sample of boys and girls, who were followed from late childhood into early adolescence. This relationship is seen for parent monitoring, but is not seen for other facets of parenting (discipline, involvement of the parent in the youth's activities, and parental reinforcement of prosocial behavior). The magnitude of the observed inverse relationship seems modest when we consider youths separated by just one unit difference on our scale of parental monitoring. If we consider two subgroups of youths, a subgroup with PM levels 10 points lower than the other subgroup, the associated difference in DPA levels is an estimated 0.7, which is on par with observed male-female difference in levels of DPA (see Table 3, adjusted model estimate for the male-female difference in level of deviant peer affiliation).

Second, there was evidence that parent monitoring of urban boys was neither

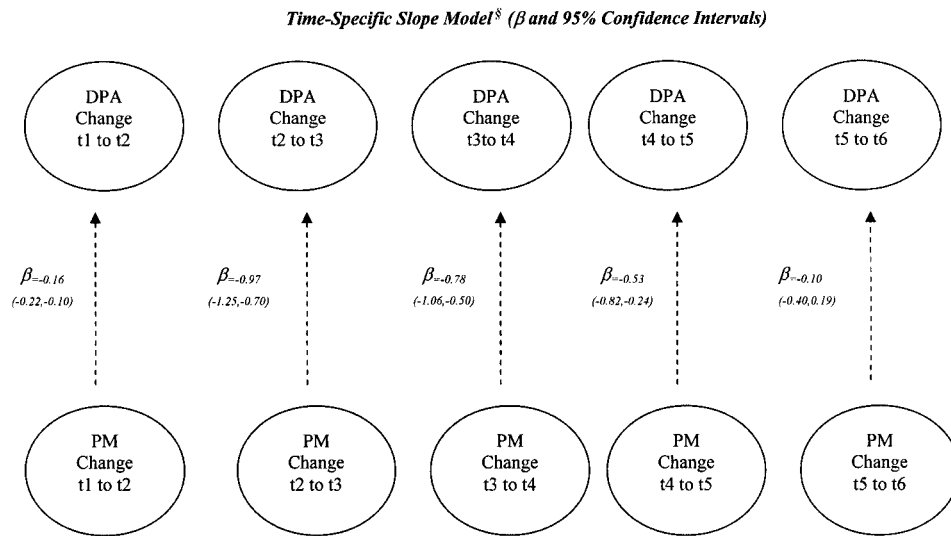


FIGURE 2. Estimates to assess whether change in level of parent monitoring (PM)* from one time point to another might be followed by change in deviant peer affiliation (DPA)† for the corresponding time points.‡*Change in parent monitoring = $PM_{time=n} - PM_{time=n-1}$. †Change in deviant peer affiliation = $DPA_{time=n} - DPA_{time=n-1}$. ‡Estimates based on generalized linear model and the method of generalized estimating equation (GLM/GEE) analyses using the robust estimator method and the exchangeable correlation structure with adjustments for baseline level of parent monitoring ($PM_{t=1}$), age, sex, race, intervention group, scholastic competence, self-derogation, level of neighborhood advantage, level of first-grade aggressive behavior, family composition, and household income. §Estimates for each time point t ($t = 1$ through $t = 6$). Estimates are anchored in relation to age: Change for $t = 1$ to 2 was change from mean age 9 to 10 years, change for $t = 2$ to 3 was change from mean age 10 to 11 years, change for $t = 3$ to 4 was change from mean age 11 to 12 years, change for $t = 4$ to 5 was change from mean age 12 to 13 years, and change for $t = 5$ to 6 was change from mean age 13 to 14 years.

more nor less important than parent monitoring of urban girls in this respect: For both boys and girls, there was an apparent inverse relationship between parent monitoring and level of affiliation with deviant peers.

Third, contrary to expectation, the relationship linking level of parent monitoring as measured in the mid-childhood years to levels of deviant peer affiliation did not seem to wane substantially with passage of time.

Fourth, when we held constant the baseline levels of parent monitoring and studied changes in levels of parent monitoring from year to year, we observed corresponding changes in levels of deviant peer affiliation: As PM levels increased, DPA levels fell; as PM levels declined, DPA levels increased. Although the magnitude of the observed relationships is modest, these observations may be important because they indicate that parents might well be able to make a difference in relation to this important facet of their children's lives despite residence in an urban environment. In this respect, it also may be important that this study has been able to constrain some of the most pertinent influences on youth behavior, including the influences of neighborhood environment, family socioeconomic status, and household composition, as well as individual-level characteristics such as self-derogation and academic self-competence.

Before more detailed discussion of these and other findings of the study, several of the most important study limitations should be reviewed. Of central concern is the generalizability of the findings. Other investigators have found relationships between parent monitoring and deviant peer affiliation, but with predominantly Caucasian samples, and most available evidence is cross sectional.^{8,32} In contrast, our evidence is from longitudinal research with a predominantly African American urban sample.

Whether other samples in other places and at other times will produce similar findings is an open question for the future. Similarly, we can only speculate about the focus of this longitudinal investigation of students who were growing up and going to school in a single urban public school system. Nonetheless, as in the study of birth cohorts who remain in the same ecological niche throughout their life spans, this study's focus on first-grade pupils who have grown up and are going to school in the same urban area and public school system provides useful information about whether parents who remain in the cities can make a difference in the lives of their children within the context of the ambient urban environment.

Some readers may be surprised at the modest estimates of the observed relationships; in response, we note that expected values based on prior cross-sectional research designs often are larger than observed values from longitudinal research. We also note that for this longitudinal research on the child-adolescent transition, it was necessary to carry forward our scale items that had been adapted for administration to children aged 8–9 years. This approach is necessary to hold measurement constant and to avoid artifacts due to changes in the measurements, but it can be a source of lower reliability in the measurement plan compared to reliabilities achievable when age-appropriate measures are applied in cross-sectional studies. To some extent, the modest size of this study's effect estimates may be due to this methodological feature of our study.

Despite clear advantages that accrue with a restriction of the sample to children whose families did not move to other ecological niches, some might be concerned that our estimates might be different if we had followed all children enrolled at baseline. In reply, we also believe the estimates might be different, as might be expected when city-dwelling students move to suburban or rural environments. However, this type of variation in the study estimate would necessitate estimates for effect modification, such as are achieved through stratification. In effect, in this study we have the estimate for the stratum of children who started school and remained in the same urban environment; we do not have an estimate for the stratum of children who moved away. Whether these stratum-specific estimates would be substantially different is an open question for future research, but this sort of variation across strata does not gainsay the importance of estimates for the residentially stable children.

Another limitation of this study involves a neglect of drug use or antisocial behaviors of mothers, fathers, or other family members, which may account for the lower levels of parent monitoring observed. Nonetheless, these parent and family characteristics can be conceptualized as causal antecedents of inept parent monitoring and are not necessarily confounding variables in the estimation of the DPA-PM relationship (e.g., Chilcoat et al.³³). In addition, we want to acknowledge the possibility of collinearity among potentially partially overlapping measures used in this study. As discussed, scale scores were centered in an attempt to address concerns about the potential for collinearity and to aid interpretation of estimates.

We also note our study's reliance on each youth's self-report about life experi-

ences. This is consistent with common practice in large psychiatric and drug epidemiologic studies. Nonetheless, a heavy reliance on youth self-report data introduces concerns about shared methods covariation and other biases that can creep into psychosocial measurements on topics such as affiliation with deviant peers and parent monitoring. Chilcoat and colleagues³³ outlined some important methodological approaches to integrating data from multiple sources on constructs such as these; in future studies, these methods can help strengthen the base of evidence.

We also note that these specific models do not encompass the dynamic interplay of parent monitoring and deviant peer affiliation, with reciprocal process: A child's affiliation with deviant peers or other behavioral characteristics may influence a parent's later level of parent monitoring, as recently elucidated by Neiderhiser and others.³⁴ However, in a subsidiary model, we did not find that baseline levels of deviant peer affiliation were influential with respect to subsequent levels of parent monitoring ($P = .3$), which lends some credence to the PM \rightarrow DPA assumption of these longitudinal models. We intend to estimate PM-DPA relationships using reciprocal process models in an elaboration of this line of research, but this elaboration requires a restriction to the subsample of youths for whom we have no missing data. Subsidiary analyses from the current study based on reestimation of the previously presented fully adjusted model restricted to youths who were interviewed at all time points failed to provide different results.

Despite these limitations, the present study possesses a number of counterbalanced strengths. With a few exceptions, most existing evidence on the link between parent monitoring and deviant peer affiliation has been based on cross-sectional studies of adolescents in primarily Caucasian samples.^{7,8,32,35} As such, the evidence from this study extends prior evidence linking earlier parent monitoring to later deviant peer affiliation from childhood into adolescence, with a predominantly African American heritage urban sample of both boys and girls.

On this basis, some additional discussion of the main findings and the subsidiary findings may be useful. The finding of an inverse relationship between parent monitoring and deviant peer affiliation suggests that an increase in levels of parent monitoring might suppress youth affiliation with deviant peers, at least to some modest but tangible extent. The fact that this relationship persisted, even with statistical control for multiple alternative predictors of youth affiliation with deviant peers, is an important finding that may underscore the importance of parent monitoring on youth affiliation with deviant peers despite individual, family, and community factors.

It is important to note that while the influence of parent monitoring might be expected to wane over time, especially as children transition into adolescence, the evidence of this study suggests otherwise. There was a relationship between levels of parent monitoring and levels of youth deviant peer affiliation in each year of the study; in addition, the common slope estimate served well when levels of deviant peer affiliation were regressed on the baseline level of parental monitoring, observed when the children were 8–9 years old. This finding suggests a possible important and persisting influence of earlier levels of parent monitoring on subsequent levels of deviant peer affiliation throughout this important developmental period, even in an urban environment.

While the overall mean parent monitoring scores did not vary much over the 6-year study period for the sample (Table 2), we did find a relationship between changes in levels of parent monitoring and changes in levels of deviant peer affiliation. We attribute this to the fact that variation in individual parent monitoring scores

from year to year may not be reflected in the mean sample scores because parent monitoring scores may be increasing for some and decreasing for others within a given year.

The finding that changes in levels of parent monitoring from one timepoint to the next are associated with changes in the level of deviant peer affiliation for the corresponding timepoints is of significance because this might suggest that parents continue to influence youth peer relationships even as youths in an urban environment transition into adolescence.

Although not a focus of this research, it may be of note that we observed an increase in levels of deviant peer affiliation as the child transitioned from childhood into early adolescence, as well as larger DPA levels for boys as compared to girls. We also note our observation that children had lower levels of deviant peer affiliation in association with levels of neighborhood advantage and levels of family impoverishment, independent of the other relationships described above, observed in an urban and sometimes socially disadvantaged urban environment. To the best of our knowledge, these relationships have not been reported by others, and they merit additional investigation and confirmation via replication before detailed discussion.

CONCLUSION

The results from this study may have important implications as we seek to explain relationships linking parent monitoring to youth affiliation with deviant peers and possibly onward to alcohol or drug use. These findings suggest that parent monitoring during childhood and adolescence might play an important role in youth affiliation with deviant peers during this developmental period.

An apparent lasting influence of parent monitoring levels during middle-to-late childhood on levels of deviant peer affiliation through early adolescence suggests possible benefits in teaching parents to monitor more effectively; we now have randomized trials to evaluate this type of intervention in our urban school system (e.g., Storr et al.³⁶).

The finding that increases in levels of deviant peer affiliation are presaged by prior reductions in levels of parent monitoring also is important and might suggest a sustained focus on monitoring and supervision well beyond the childhood years. Chilcoat and Anthony,¹² among others, have found that risk of early-onset drug use is greater at the higher levels of deviant peer affiliation. An implication for drug prevention research is that affiliation with deviant peers might serve as a proximal end point in trials to evaluate the impact of parenting programs on risk of early-onset drug use.

In future research that builds on this study, it may be possible to find more substantial evidence that parents can make a difference in whether their children fall in with the wrong crowds, even in urban and socially disadvantaged neighborhoods. What we see here is some new evidence that parents in urban areas can make some difference, albeit at levels more modest than we had hoped. One immediate challenge is to find ways for parents to be even more effective when they try to promote the social adaptation of their children. Storr and colleagues³⁶ described a specific program of action in this regard, with a family-school partnership and parent training for better supervision and monitoring, designed to improve child outcomes during the primary school years; early evidence from a randomized controlled trial of this program seems favorable.

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