Published in final edited form as:

J Abnorm Child Psychol. 2008 April ; 36(3): 299–310. doi:10.1007/s10802-007-9178-4.

Parents' Monitoring Knowledge Attenuates the Link Between Antisocial Friends and Adolescent Delinquent Behavior

Robert D. Laird,

Department of Psychology, University of New Orleans, 2001 Geology & Psychology Building, New Orleans, LA 70148, USA, rlaird@uno.edu

Michael M. Criss,

Oklahoma State University, Stillwater, OK, USA

Gregory S. Pettit,

Auburn University, Auburn, AL, USA

Kenneth A. Dodge, and

Duke University, Durham, NC, USA

John E. Bates

Indiana University, Bloomington, IN, USA

Abstract

Developmental trajectories of parents' knowledge of their adolescents' whereabouts and activities were tested as moderators of transactional associations between friends' antisociality and adolescent delinquent behavior. 504 adolescents (50% female) provided annual reports (from ages 12 to 16) of their parents' knowledge and (from ages 13 to 16) their own delinquent behavior and their friends' antisociality. Parents also reported the adolescents' delinquent behavior. Growth mixture modeling was used to identify two sub-groups based on their monitoring knowledge growth trajectories. Adolescents in the sub-group characterized by decreasing levels of parents' knowledge reported more delinquent behavior and more friend antisociality in early adolescence, and reported greater increases in delinquent behavior and friend antisociality from early to middle adolescence compared to adolescents in the sub-group characterized by increasing levels of parents' knowledge. Transactional associations consistent with social influence and social selection processes also were suppressed in the increasing knowledge sub-group as compared to the decreasing knowledge sub-group.

Keywords

Parenting; Monitoring; Delinquent behavior; Peer relationships; Moderation

An extensive body of literature has shown that adolescents are less involved in a wide range of problem behaviors when their parents know more about their whereabouts, companions, and activities (e.g., DeVore and Ginsburg 2005; Kilgore et al. 2000; Luster and Oh 2001). What is less understood, however, is why more monitoring knowledge is associated with less delinquency and maladjustment. One possibility is that the peer relationship processes that contribute to or facilitate delinquent behavior are disrupted when parents are knowledgeable.

Specifically, adolescents may be less likely to establish relationships with antisocial peers and also may be less susceptible to the negative consequences of friends' antisocial behavior when their parents remain informed. The purpose of this study is to determine whether the transactional associations between antisocial peers and delinquent behavior are attenuated when parents are reported to be more knowledgeable.

Peer Influence and Social Selection

Adolescents' delinquent behavior is predicted strongly by the extent to which adolescents' peers are involved in delinquent activity (e.g., Simons et al. 1994; Warr and Stafford 1991). Associations between adolescent behavior and peer behavior have been shown to result from both social selection and influence processes (see Dishion et al. 1994; Fisher and Bauman 1988; Tremblay et al. 1995). Social selection processes refer to when children and adolescents seek out and form relationships with individuals who have interests similar to their own. Social influence or socialization processes, in contrast, indicate that children's and adolescents' behavior is influenced by the behavior of their peers. Antisocial friends are assumed to exert this influence through modeling, by reinforcing antisocial attitudes, or by providing opportunities to engage in misbehavior (Dishion et al. 1994). Although conceptually and operationally distinguishable, selection and influence processes likely operate in tandem in a transactional manner such that initially mildly delinquent adolescents gravitate toward like-minded peers who subsequently reinforce one another's delinquent behaviors escalating the severity and frequency of delinquent behavior for all (Kandel 1978).

Past research examining this issue has utilized cross-lag correlations (e.g., Dishion and Owen 2002; Kemp et al. 2006; Sieving et al. 2000) or multi-domain latent growth curve analyses (e.g., Simons-Morton et al. 2004; Wills and Cleary 1999) to identify selection and influence processes. In the cross-lag correlation framework, evidence of peer influence is provided by correlations or regression coefficients showing that delinquent behavior at one time point is positively correlated with peer antisociality at the next time point while controlling for rank-order stability in peer antisociality. Evidence of selection is provided by correlations or regression coefficients showing that peer antisociality at one time point is positively correlated with delinquent behavior at the next time point while controlling for stability in delinquent behavior. In the latent growth curve framework, evidence of peer influence is provided by a positive association between time 1 levels of peer antisociality and subsequent growth in delinquent behavior whereas evidence of selection is provided by a positive association between time 1 levels of delinquent behavior and subsequent growth in peer antisociality. In the current study, Curran and Bollen's (2001) framework for combining multi-domain latent growth curve models and cross-lagged path models was used to integrate the two approaches for testing influence and selection. This integrated approach examines cross-lagged paths consistent with selection and influence processes while controlling for individual differences in developmental change in delinquent behavior and antisocial friends as well as the correlation between change in delinquent behavior and antisocial friends. Multi-group modeling procedures were used to test whether paths consistent with selection and influence processes differ for adolescents reporting higher versus lower levels of knowledge.

Monitoring Knowledge as a Moderator of Selection and Influence Processes

Parents' knowledge of adolescents' whereabouts and activities is considered to be the outcome of the third phase of the monitoring process as described by Hayes et al. (2003). Establishing expectations and rules is the first phase and adolescent free-time behavior is the second phase of the process. The third phase of the monitoring process provides parents an opportunity to determine how, where, and with whom adolescents have spent their free time and whether the parents' rules and expectations were violated. As such, high levels of knowledge indicate that

parents are aware of their children's whereabouts, activities, and friends (Hirschi 1969; Patterson et al. 1992). Adolescents appear to actively manage the information provided to their parents by avoiding discussions, lying, and leaving important details out of their conversations (Darling et al. 2006). Thus, adolescent disclosure of information appears to be the primary proximal source of parents' monitoring knowledge with additional information provided by parents' solicitation of information (from their children, teachers, and other parents), and family rules regarding how and where adolescents are expected to spend their time (Crouter et al. 2005; Crouter et al. 1999; Stattin and Kerr 2000; Snyder and Patterson 1987; Waizenhofer et al. 2004). Further understanding the links among monitoring knowledge, antisocial friends, and delinquent behavior may begin to provide insight into why more monitoring knowledge is associated with less delinquent behavior.

In terms of main effects, a lack of monitoring knowledge is associated with both greater involvement in delinquent behavior (e.g., Kilgore et al. 2000; Luster and Oh 2001) and greater involvement with antisocial peers (e.g., Dishion et al. 1991). Such main effects are well established but provide limited information regarding whether peer influence or selection processes are disrupted when parents are informed. However, several cross-sectional studies provide evidence that the correlation between peer and adolescent deviant behavior (i.e., substance use and sexual behavior) is stronger when parents are less aware of their adolescents' activities (Dishion et al. 1995; Rai et al. 2003; Wood et al. 2004). Furthermore, Coley et al. (2004) report longitudinal data showing that adolescents experiencing unsupervised out-of-home care (which is presumed to often involve contact with antisocial peers) reported less delinquency when parents were more informed. However, moderation was not found in two other longitudinal studies. Kemp et al. (2006) failed to find evidence that monitoring knowledge moderated links consistent with social influence over a 1-year period in middle adolescence. Likewise, Vitaro et al. (2000) found that greater attachment to parents, but not greater monitoring knowledge, reduced the influence of deviant friends on early adolescent deviant behavior over a 2-year period in early adolescence. No study that we are aware of has tested whether monitoring knowledge moderates associations consistent with social selection processes using longitudinal data.

Extant evidence indicates that a portion of the variability in monitoring knowledge trajectories is due to differences in how parents supervise and regulate the behavior of their sons and daughters. Specifically, there tends to be a lower level of (Dishion and McMahon 1998), and a greater reduction in (Laird et al. 2003a), parental awareness of daily activities and whereabouts of sons than daughters over the course of adolescence. Sons also may be more likely to engage in antisocial behavior and to affiliate with deviant friends (Hyde 1984; Maccoby and Jacklin 1980). Therefore, exploratory analyses were conducted for boys and girls separately to determine if findings are similar for both genders.

The purpose of the current study was to determine whether associations between antisocial friends and delinquent behavior are moderated by parents' monitoring knowledge. We hypothesize that the associations between delinquent behavior and antisocial friends consistent with selection and influence processes are weaker for youth with highly informed parents as compared to youth with less informed parents. We also hypothesize main effects for monitoring knowledge such that when knowledge is consistently high adolescents are less delinquent, less likely to affiliate with antisocial peers and will experience smaller increases over time in delinquent behavior and antisocial friends. All of these hypotheses were tested using nesting procedures within a multi-group structural equation model.

Materials and Methods

Participants

Data were obtained from the ongoing Child Development Project (CDP), a multi-site, longitudinal study of children's and adolescents' adjustment from kindergarten through early adulthood (see Dodge et al. 1990; Pettit et al. 2001). Data used in the current study were collected over a 5-year period, covering ages 12 to 16 and beginning 7 years after participants were initially recruited for the study. To minimize long-term attrition, individuals were allowed to participate in some data collection waves and to decline to participate in others. Thus, data were missing at different time points for different participants. Analyses were conducted using the AMOS 6.0 software package (Arbuckle 2005), which handles missing data using a full information maximum likelihood approach offering advantages over more traditional listwise and pairwise deletion approaches (Schafer and Graham 2002; Wothke 2000). Specifically, only adolescents with valid data from at least one time point for each of the three primary variables (monitoring knowledge, antisocial friends, and delinquent behavior) were included in the analysis sample. This requirement limited the sample to 504 adolescents. These 504 participants who provided sufficient data were compared to the remaining 81 original CDP participants (i.e., 62 adolescents did not provide any data from ages 12 to 16 and 19 adolescents provided insufficient data to be included in the analyses) in terms of age 4 demographic characteristics and behavior problems. Participants included in the final sample were less likely to be male (49.8%) than were participants with insufficient data (64.4%), $\chi^2(1)=6.30, p=0.02$. Participants in the final sample (82.5% European-American, 16.3% African-American) did not differ from participants with insufficient data (75.9% European-American, 18.4% African-American) in terms of ethnicity, $\chi^2(1)=2.19, p=0.14$, Hollingshead four-factor socioeconomic status (SES) scores, $M_s=39.87$ and 37.57 , $SD_s=14.33$ and 11.81 , respectively, $t(568)=1.39, p=0.17$, or in terms of prekindergarten parent-reported externalizing behavior problems $M_s=11.61$ and 10.93 , $SD_s=7.03$ and 6.97 , respectively, $t(565)=0.81, p=0.42$.

Procedure and Measures

Participating parents and adolescents were contacted when the adolescents were 12, 13, and 16 years of age and asked to participate in an interview session. Parents and adolescents completed questionnaires mailed to their homes at ages 14 and 15. Written consent and verbal assent was obtained from parents and adolescents, respectively, each year and individuals were compensated for their participation in each wave of data collection.

Monitoring Knowledge—Items assessing adolescents' perceptions of their parents' knowledge of their adolescents' whereabouts, companions, and activities were adapted from Brown et al. (1993) and Dishion et al. (1991). This measure of knowledge often has been labeled monitoring or supervision. Adolescents responded to five knowledge items (e.g., "How much do your parents know about who your friends really are?" "How much do your parents really know about where you are most afternoons after school?") using a three-point response scale (1="don't know", 2="know a little", 3="know a lot") in the interviews (at ages 12, 13, and 16) and questionnaires (at ages 14 and 15). However, the administration differed such that adolescents reported on "parents" in interviews and on each parent separately in the questionnaires. Responses to "mother" and "father" items were significantly correlated, $r_s=0.42$ to $0.68, p_s<0.001$. Reasoning that it is only necessary for one parent to know the adolescent's whereabouts and activities and that one parent may assume primary responsibility for doing so, and evidence that averaging across separate mother and father reports underestimated knowledge in comparison to time periods when adolescents were reporting on parents, the higher score was used for each item when adolescents reported on each parent separately. A *monitoring knowledge* score was computed each year as the mean of the five items. Means, standard deviations, Cronbach's alphas, and bivariate correlations are presented

in Table 1. The monitoring knowledge scores were normally distributed, skew <1.4 at all ages. The low reliability at age 12 results from limited variability on several of the individual items with most adolescents reporting that their parents “know a lot” in response to those items. Despite the low reliability, the correlations between the age 12 scores and the scores at ages 13–16 are of similar magnitude to the intercorrelations among scores at other ages.

Perceptions of Friends’ Antisociality—Yearly, from age 13 through 16, adolescents described their friends’ involvement in antisocial behavior using items adapted from Dishion et al. (1991). The ten items (e.g., gets into fights, steals things, uses alcohol) were rated on a five-point scale (1=“they never do this”, 5=“they do this very often”). Adolescent perceptions of *friends’ antisociality* at each age were computed by summing across the ten items. The friends’ antisociality scores were normally distributed, skew <1.8 at all ages.

Delinquent Behavior Problems—The index of adolescent delinquent behavior problems was based on adolescent and parent reports. Yearly, from ages 13 through 16, adolescents completed the Youth Self-Report (YSR; Achenbach 1991b) and parents completed the Child Behavior Checklist (CBC; Achenbach 1991a). Both instruments are standardized checklists of behavior problems commonly experienced during childhood and adolescence. The YSR delinquency subscale contains 11 items and the CBC delinquency subscale contains 13 items. Two items (i.e., “I hang around with kids who get in trouble” and “I would rather be with older kids than with kids my own age”) that appear to assess antisocial friends were removed from each subscale. Each of the remaining 20 items (e.g., steals, uses alcohol or drugs, lying or cheating) was scored on a three-point scale (0=“not true”, 1=“somewhat true”, 2=“very often true”). Parent and adolescent reports were significantly correlated at each age, $r_s=0.26, 0.42, 0.45$, and 0.41 , all $p_s<0.001$, for ages 13 to 16, respectively. Multi-informant *delinquent behavior* composite scores were computed at each age as the mean of the 20 individual items. The delinquent behavior scores were modestly skewed, skew=1.5 to 2.6, but analyses conducted with transformed variables yielded identical conclusions and thus analyses with the original variables are presented. The lower reliability at age 13 appears to reflect both limited variability on some items at that age with relatively few adolescents engaging in those forms of delinquent behavior and less parent-child agreement at that age. However, despite the lower reliability, the correlations between the age 13 scores and the scores at ages 14–16 are of similar magnitude to the intercorrelations among scores at other ages.

Results

Analyses were completed in four steps. First, analyses were conducted to identify common longitudinal patterns of adolescent-reported monitoring knowledge using growth mixture modeling. Next, structural equation modeling (SEM) was used to model longitudinal associations between adolescent perceptions of friends’ antisociality and adolescent delinquent behavior. The fitted models combined elements from dual trajectory latent growth curve modeling with cross-lag path modeling. The third step in the analysis was to impose constraints on the fitted models equating parameters across the monitoring knowledge groups to determine whether parameters from the models differed significantly as a function of knowledge group membership. The fourth step in the analyses was to conduct exploratory analyses to determine whether patterns of moderation were similar for males and females.

Identifying Common Longitudinal Patterns of Monitoring Knowledge

The first step was to identify developmental trajectory clusters for monitoring knowledge. A growth mixture model was fit to identify unobserved heterogeneity in the sample. Growth mixture modeling differs from growth curve modeling in that it does not assume that individuals are drawn from a single population and instead allows sub-classes of individuals

to vary around different mean growth curves (Muthén 2004). The growth mixture model sought to identify sub-populations with common patterns of change and/or stability within the distribution of individual developmental trajectories. Although it would have been possible, for example, to compute a mean level of monitoring knowledge over the five waves and then to split the sample into halves or thirds based on the distribution of the scores (e.g. Kemp et al. 2006), such a division would have been arbitrary. In contrast, the growth mixture modeling procedure identifies natural breaking points for the groups based on the components of the individual trajectories (e.g., starting points, rates of change). SAS PROC TRAJ (Jones et al. 2001) was used to select the appropriate trajectory cluster solution. The data analyst specifies the desired number of groups and the shape of the trajectories for each group. Models were fit specifying two and three group solutions with combinations of stable (i.e., intercept only), linear, and quadratic shapes as recommended by Jones et al. (2001). A three group model with quadratic, intercept only (i.e., no change), and quadratic terms for the three groups, respectively, provided the best fit to the data, $BIC = -3,881.1$. However, two of the groups were too small (i.e., 24 and 16% of the sample, respectively) for the groups to be used in the SEM multi-group analyses. Doing so frequently resulted in inadmissible solutions in the smallest group. Therefore the best-fitting two group model, $BIC = -3,938.3$, was selected for further analysis.

The best-fitting two group model identified the natural breaking point for two groups based on both groups having quadratic growth trajectories and is shown in Fig. 1. The first group (42.1% of the sample) was distributed around a mean trajectory characterized by high levels of monitoring knowledge at age 12 that declined until age 14 before leveling off. The mean trajectory for the second group (57.9%) shows a higher level of monitoring knowledge at age 12 that increased modestly until age 15 before leveling off. Intercept, linear slope, and quadratic slope estimates differed significantly, $ps < 0.001$, across the two groups suggesting that the two groups represent distinct sub-populations within the sample. In the following sections, these two groups will be referred to as the moderate-decline and high-increase groups, respectively.

Modeling Longitudinal Associations Between Friends' Antisociality and Adolescent Delinquent Behavior

First, a dual trajectory growth curve model was specified to model simultaneous growth in friend antisociality and adolescent delinquent behavior from ages 13 to 16. The dual trajectory growth model included intercept and linear change factors for both variable domains. The path values from the linear change factor to the indicators were specified as 0, 1, 2, and 3 so that the intercept factors represent age 13 levels of friend antisociality and delinquent behavior. Covariances were included between the two intercept factors, between the two slope factors, and between the two intercept-slope cross-domain combinations (e.g., friends' antisociality intercept and delinquent behavior slope). To account for methodological variations (i.e., face-to-face interviews at ages 13 and 16, and mailed questionnaires at ages 14 and 15), covariances were added between two sets of the friends' antisociality error terms (between ages 13 and 16 and ages 14 and 15).

The dual trajectory growth curve model was modified by adding cross-lag paths between the friends' antisociality and delinquent behavior problem indicators (see Curran and Bollen 2001 for more information on this type of model). In this combined dual trajectory growth and annual cross-lagged model, developmental change is modeled by the growth curve portion of the model so the cross-lag paths measure change from 1 year to the next that is greater or less than anticipated based on the individuals' growth trajectory (Curran and Bollen 2001). The cross-lag paths from friends' antisociality to delinquent behavior problems index the influence of friends' antisociality on delinquent behavior problems when controlling for individual differences in growth in friends' antisociality and delinquent behavior problems. These cross-

lag paths are consistent with peer influence processes. The cross-lag paths from delinquent behavior to friends' antisociality index the influence of delinquent behavior on friends' antisociality when controlling for growth in the two constructs. These cross-lag paths are consistent with peer selection processes. The dual trajectory growth and annual cross-lagged model is shown in Fig. 2.

Multi-group modeling procedures were used to evaluate the fit of the models in the two monitoring knowledge groups. It was necessary to constrain the covariance between the two slope terms to be equal across the two groups. Without the constraint, the correlation between the two slope factors was estimated to be greater than 1.0 in the moderate-decline group. The correlation in the high-increase group also was quite strong so imposing the constraint was acceptable and had a minimal impact on the other parameters being estimated (a test of nested models was not possible because parameter estimates in the unconstrained model were invalid). Initially, the models were fit without imposing additional constraints across the knowledge groups. Both the dual trajectory growth, $\chi^2(33, n=504)=82.98, p<0.001, RMSEA=0.055, CFI=0.957, NFI=0.933$, and combined dual trajectory and annual cross-lagged models, $\chi^2(29, n=504)=50.15, p=0.009, RMSEA=0.038, CFI=0.982, NFI=0.959$, provided a good fit to the data.

Imposing Constraints to Determine Whether Associations are Moderated by Monitoring Knowledge

Next, a series of constraints were imposed on the dual trajectory growth and combined dual trajectory and annual cross-lagged models to determine whether the two monitoring knowledge groups differed in terms of (a) age 13 levels of friends' antisociality and delinquent behavior, (b) associations between age 13 levels and between rates of growth in friends' antisociality and delinquent behavior, (c) or in the cross-lagged paths. Constraints were imposed equating the parameters across the two knowledge trajectory groups. Each parameter was tested individually with the exception of the cross-lagged paths as noted below. Age 13 levels and associations between age 13 levels and rates of growth were tested using the dual trajectory growth models because the growth rates are more interpretable when cross-lagged paths are not included. When the cross-lagged paths are included in the models, the growth factors are residuals controlling for the cross-lagged effects and the parameter estimates for the growth factors may indicate that no change is occurring because the developmental change is captured by the cross-lagged paths. However, the cross-lagged paths were tested using the combined dual trajectory growth and annual cross-lagged model because it is necessary to control for individual differences in developmental change when evaluating the cross-lagged paths in this model. A set of constraints was imposed on the cross-lagged paths to equate the paths across the three time lags within each group. The constraints did not significantly worsen the fit of the model, $\Delta\chi^2(8)=15.21, p>0.05$, indicating equivalence across the three time lags. Table 2 summarizes the analyses and shows the parameter estimates for each knowledge trajectory group. The tests of inequality refer to the comparisons of models with parameters free to vary across groups versus constrained to be equal across the monitoring knowledge groups. Statistically significant tests of inequality indicate that the parameters differ across the two groups.

The analyses indicate that the monitoring knowledge groups differ in age 13 levels of friends' antisociality and delinquent behavior with the most antisocial friends and delinquent behavior found in the moderate-decline knowledge group. The monitoring knowledge groups also differed in the rate of change in both friends' antisociality and delinquent behavior. Both groups reported increases in friends' antisociality and delinquent behavior but the increases were more substantial in the moderate-decline group. Delinquent behavior and friends' antisociality levels at age 13 were positively correlated in both groups as were the rates of change in delinquent

behavior and friends' antisociality. In both groups, adolescents who were more delinquent at age 13 reported having friends who were more antisocial and adolescents who became more delinquent over time also reported increased perceptions of friends' antisociality. Only one correlation consistent with a selection effect was significant. Delinquent behavior at age 13 was associated with increases in friends' antisociality among the moderate-decline group only. The correlations consistent with influence effects were not significant in either group.

Cross-lag associations differed significantly across the two groups. Cross-lag paths from friends' antisociality to delinquent behavior were significant in the high-increase group but not in the moderate-decline group. Although the cross-lagged paths from friends' antisociality to subsequent delinquent behavior can index peer influence, the path values in the high-increase group show that more antisocial friends were associated with subsequent reductions in delinquent behavior indicating that peer influence processes were suppressed in the high-increase group as compared to the moderate-decline group. In contrast, the cross-lag paths from delinquent behavior to friends' antisociality were significant in the moderate-decline group but not in the high-increase group. The path values are consistent with selection processes and suggest that high levels of delinquent behavior are associated with subsequent increases in adolescents' perceptions that their friends engage in antisocial behavior. Overall, the cross-lagged paths suggest that both selection and influence processes are attenuated in the high-increase group compared to the moderate-decline group.

Limited variability in one group or differences in variability across groups may produce interactions. Therefore, to determine whether such an alternative interpretation of the differences in the cross-lagged paths is tenable, the error variances from the dual trajectory growth models were examined for each of the four measures of friends' antisociality and delinquent behavior. In this case, the error variances indicate variance not accounted for by the growth portion of the models and thus provide evidence of whether variance is available for the cross-lagged paths. Significant, $p < 0.001$, variance remained in each of the four delinquent behavior measures and in three of the four friends' antisociality measures. Only the age 16 friends' antisociality measure in the moderate-decreasing knowledge group had limited variance, $p < 0.10$. Next, the error variances for the four delinquent behavior measures were constrained to be equal across the two knowledge groups to test whether the variance was equivalent across groups. The imposition of the constraints significantly worsened the fit of the model, $\Delta\chi^2(4) = 111.2$, $p < 0.001$. Likewise, constraints on the error variances for the friends' antisociality variables significantly worsened the fit of the model, $\Delta\chi^2(4) = 82.8$, $p < 0.001$, indicating that the variance differs across the two groups. Variance in both delinquent behavior and friends' antisociality was greater in the moderate-decline group than in the high-increasing group and thus, paths for the moderate-decline group would be expected to be stronger than paths for the high-increasing group. That was not the case. Therefore, it is unlikely that differences in variability account for the pattern of findings in this study.

Exploratory Tests of Gender Moderation

A set of exploratory analyses was conducted to determine whether findings generalize across gender groups. First, gender and monitoring trajectory group membership were cross-tabulated. Females were underrepresented in the moderate-decline trajectory group, $\chi^2(1) = 5.33$, $p = 0.02$, with 37% of females classified as members of moderate-decline trajectory group as compared to 47% of the males. Second, analyses testing for monitoring group differences were conducted separately for the male and female sub-samples. Results are summarized in Table 2.

Knowledge trajectory group mean-level differences in friends' antisociality and adolescent delinquent behavior at age 13 were significant in both the male and female sub-samples. However, mean rates of change in friends' antisociality and adolescent delinquent behavior

differed significantly across the two knowledge trajectory groups in the male sub-sample but not in the female sub-sample. Males in the moderate-decline group experienced a significantly greater increase in friends' antisociality and their own delinquent behavior, $M_s=2.55$ and 0.03 , $SE_s=0.20$ and 0.006 , than males in the high-increase group, $M_s=1.72$ and 0.011 , $SE_s=0.17$ and 0.004 , respectively. Although females in the moderate-decline group also experienced a greater increase in friends' antisociality and their own delinquent behavior, $M_s=2.14$ and 0.03 , $SE_s=0.29$ and 0.008 , than females in the high-increase group, $M_s=1.57$ and 0.017 , $SE_s=0.17$ and 0.004 , the female means were not significantly different from one another. Finally, cross-lag paths consistent with influence processes were moderated significantly by knowledge group membership for females, but not for males whereas cross-lag paths consistent with selection processes were moderated significantly by knowledge group membership for males but not for females. Inspection of path values indicates that influence processes were suppressed for females in the high-increase group, $\beta_s=-0.09$ to -0.10 , all $ps<0.01$, as compared to females in the moderate-decline group, $\beta_s=0.04$ to 0.06 , all $ps>0.05$, and males in either the high-increase group, all $\beta_s=-0.05$, all $ps>0.05$, or the moderate-decline group, $\beta_s=0.01$ to 0.02 , all $ps>0.05$. In contrast, inspection of the path values indicates that selection processes were suppressed for both females, $\beta_s=0.07$ to 0.09 , all $ps>0.05$, and males, $\beta_s=-0.07$ to -0.08 , all $ps>0.05$, in the high-increase groups as compared to females, $\beta_s=0.20$ to 0.29 , all $ps<0.01$, and males, $\beta_s=0.21$ to 0.27 , all $ps=0.001$, in the moderate-decline group.

Discussion

The purpose of this study was to determine whether associations between friends' antisociality and adolescent delinquent behavior are moderated by parents' monitoring knowledge. Results are consistent with the hypothesis that monitoring knowledge attenuates the link between friends' antisociality and delinquent behavior. Specifically, as compared to adolescents' who perceive that their parents are consistently knowledgeable, adolescents who describe their parents as less aware of their whereabouts and activities (a) report higher levels of delinquent behavior and more antisocial friends in early adolescence, (b) report more rapid increases in friends' antisociality and their own delinquent behavior from middle to late adolescence, (c) are more likely to report increased antisociality among friends when the adolescents themselves engage in delinquent behavior (selection process), and (d) are less likely to report decreases in delinquent behavior following involvement with antisocial friends (influence process). When considered together, these findings suggest that adolescents are unlikely to form relationships with antisocial peers, and are unlikely to be negatively influenced by the behavior of antisocial peers, when they believe that their parents maintain high levels of awareness.

Exploratory analyses suggest that knowledge moderates links between peer antisociality and delinquent behavior for both males and females. Mean-level gender differences were limited to females reporting more knowledgeable parents at ages 14 and 16 and less peer antisociality at age 16. The higher level of parents' knowledge at ages 14 and 16 reported by females is reflected in the under-representation of females in the moderate-decline trajectory group. The minor differences in the trajectory group moderation analyses likely result from the differences in statistical power due to fewer females in the moderate-decline group. Overall, the set of results suggests that although low levels of knowledge and high levels of peer antisociality function similarly as delinquent behavior risk factors for males and females, females are somewhat more likely than males to be protected from negative peer selection and influence processes by consistently high levels of parental knowledge.

Findings from this investigation provide further evidence regarding the benefits of parents being informed of their adolescents' activities. The longitudinal data demonstrate that high and increasing levels of monitoring knowledge are linked to smaller increases in delinquent behavior and antisocial peer involvement over the course of middle adolescence, particularly

for boys. These findings are consistent with results from previous studies showing that less monitoring knowledge predicts future increases in delinquent behavior (e.g., Kilgore et al. 2000; Pettit et al. 2001). Furthermore, findings from the current study indicate that the limited increases in delinquent behavior and friends' antisociality appears to result, at least in part, from a disruption of the peer relationship processes that contribute to or facilitate delinquent behavior. Adolescents were found to be less likely to report increased antisociality among friends and less susceptible to the consequences of friendships with antisocial peers when their parents were consistently informed. Although it is possible that monitoring knowledge moderates selection and influence processes in the absence of additional intervening processes, it is also possible that parental awareness allows for, facilitates, or reflects additional processes or interactions that function more proximally to disrupt selection and influence processes. At this point, we can only speculate as to what the more proximal processes may be and how they may operate.

The traditional perspective on parental monitoring proposes that knowledge functions as a feedback component in behavior regulation, allowing parents to gauge the success of their previous socialization attempts and adapt accordingly (Crouter et al. 1999; Dishion and McMahon 1998; Hayes et al. 2003). Essentially, this perspective suggests that monitoring knowledge provides parents opportunities to intervene and correct misbehavior before it becomes unmanageable or to prevent further negative consequences of the behavior. When interpreted from the traditional perspective, data from the current study suggest that less informed parents have insufficient opportunities to redirect their adolescents' misbehavior or to discourage the formations of friendships with antisocial peers. In contrast to the traditional perspective, the information management perspective emphasizes adolescents' ability to manage the amount and quality of their parents' monitoring knowledge (Stattin and Kerr 2000; Darling et al. 2006). Kerr and Stattin (2003) speculate that frequent adolescent disclosure, and thus high levels of monitoring knowledge, are indicative of relatively well-adjusted, easily socialized youth who have little to hide from their parents and are unlikely to misbehave even when interacting with antisocial peers. Finally, broader perspectives on monitoring suggest that parents' awareness is the product of a long-term, relationship-based process (Crouter et al. 1990). As a relationship property, parents' monitoring knowledge may serve as a proxy for the functioning of the adolescent and parent-adolescent relationship attributes that facilitate disclosure and solicitation. Specifically, when parents are consistently informed, we may presume that the parent-child dyad is characterized by high levels of trust and positivity and by high levels of parental socialization (Kerr et al. 1999; Laird et al. 2003b). Such experiences may empower adolescents to form relationships with well-adjusted, rather than antisocial, peers and to resist negative peer influence.

While the current study focused on monitoring knowledge as a predictor and moderator of links between friend antisociality and adolescent delinquent behavior, our previous work has shown the relations between monitoring knowledge and delinquent behavior to be reciprocal (Laird et al. 2003a). Specifically, although the current study emphasizes that growth in friends' antisociality and delinquent behavior is increased and selection and influence processes are strongest when knowledge is low, it is important to recognize that high levels of friends' antisociality and delinquent behavior are associated with reductions in knowledge over time (Laird et al. 2003b). The knowledge trajectory analyses suggest that the reductions in monitoring knowledge are primarily limited to, and most pronounced among, those parents who were the least knowledgeable when their children were early adolescents.

The prospective longitudinal design and relatively large sample size are important strengths of the study. Limitations of the study include the age range covered, the use of the two-group growth mixture model, and reliance on adolescent perceptions of parents' monitoring knowledge and friends' antisociality. Change in monitoring knowledge, delinquent behavior,

and friend antisociality was modeled across the middle adolescent years. It is likely that family and peer relationships are more dynamic during the transition from childhood to adolescence (Steinberg and Silk 2002). Focusing on middle adolescence may have underestimated variability in monitoring knowledge trajectories and perhaps, underestimated the moderation effects. Alternatively, the moderating effect of monitoring knowledge in middle adolescence may reflect the developmental course of late-starters which may be more susceptible to parental influence than the developmental course of life-course persistent individuals (Moffitt 1993).

Although the three-group growth mixture model provided a better fit to the data than the two-group model, the sub-populations identified by the three-group model proved difficult to analyze. However, it was possible to conduct some of the analyses using three, rather than two, knowledge groups. Analyses conducted with the three groups indicated that findings were very similar with the primary distinction being that the selection and influence effects were limited to the sub-group reporting the lowest levels of knowledge. However, this group was also the smallest and provided the least robust parameter estimates.

It is possible that adolescent perceptions of parents' monitoring knowledge and parents' actual knowledge exert their influence through somewhat different routes and processes. For example, adolescent perceptions may be more likely to inhibit adolescent involvement in delinquent behavior or involvement with antisocial peers because the adolescents believe that their parents will learn of their misbehavior. In contrast, parent perceptions may be a stronger indicator of parental involvement and interest in the adolescents' activities. Reliance on adolescent perceptions of peers, as compared to peer reports of their own antisocial behavior, has two primary limitations. First, due to shared method variance, adolescent reports may overestimate similarity in adolescent and peer behavior. Second, delinquent adolescents may have distorted perceptions of normative behavior and thus overestimate their friends involvement in antisocial behavior (Fisher and Bauman 1988; Urberg et al. 1991). Such distorted perceptions are likely to yield overestimates of selection processes and of correlations between rates of change in friends' antisociality and delinquent behavior (Berndt and Keefe 1995; Iannotti et al. 1996; Urberg et al. 1991).

In summary, the current study provides further empirical support for the link between monitoring knowledge and delinquent behavior. In terms of replicating prior results, findings indicate that lower and decreasing levels of monitoring knowledge are associated with increases in both delinquent behavior and friends' antisociality during middle adolescence. In terms of contributing new information, findings indicate that high and increasing levels of monitoring knowledge suppress the likelihood that delinquent adolescents will form friendships with like-minded peers and also the likelihood the friendships with antisocial peers will lead to escalations in delinquent behavior.

Acknowledgment

This research was supported by grants from the National Institute of Mental Health (MH 42498, MH 56961, MH 57024, MH 57095), the National Institute of Child Health and Human Development (HD 30572), and the National Institute on Drug Abuse (DA 16903) to G. S. Pettit, K. A. Dodge, & J. E. Bates, and from the Louisiana Board of Regents Support Fund (LEQSF-RD-A-02) and the National Science Foundation (BCS 0517980) to R. D. Laird.

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Fig. 1.
Monitoring knowledge trajectory groups

Fig. 2.
 Combined dual trajectory growth and annual cross-lagged model. *FA* Friends' antisociality.
 Paths with the same letter values were constrained to be equal

Table 1

Statistics and correlations among all variables

M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
2.70	0.26	0.42												
2.63	0.36	0.40***	0.65											
2.64	0.37	0.37***	0.42***	0.72										
2.63	0.41	0.27***	0.35***	0.60***	0.78									
2.62	0.41	0.25***	0.32***	0.45***	0.45***	0.75								
14.70	4.45	-0.35***	-0.31***	-0.25***	-0.25***	-0.23***	0.79							
17.44	6.36	-0.20***	-0.35***	-0.51***	-0.48***	-0.38***	0.45***	0.87						
18.56	7.08	-0.21***	-0.27***	-0.37***	-0.53***	-0.40***	0.39***	0.61***	0.88					
20.87	6.74	-0.19***	-0.21***	-0.29***	-0.38***	-0.46***	0.34***	0.54***	0.63***	0.87				
0.13	0.15	-0.31***	-0.32***	-0.24***	-0.28***	-0.33***	0.45***	0.43***	0.28***	0.34***	0.69			
0.15	0.15	-0.19***	-0.27***	-0.44***	-0.45***	-0.41***	0.29***	0.63***	0.50***	0.49***	0.54***	0.80		
0.16	0.16	-0.18***	-0.32***	-0.37***	-0.51***	-0.41***	0.29***	0.52***	0.60***	0.51***	0.51***	0.65***	0.82	
0.20	0.15	-0.16***	-0.21***	-0.33***	-0.38***	-0.47***	0.25***	0.43***	0.47***	0.60***	0.48***	0.60***	0.65***	0.81
0.50	0.50	0.05	0.05	0.12*	0.03	0.19***	-0.06	-0.01	0.01	-0.12*	-0.06	-0.04	0.01	-0.08
39.87	14.33	0.01	0.07	0.07	0.06	0.10*	-0.17***	-0.12*	-0.02	-0.01	-0.18***	-0.08	-0.08	-0.12*

Cronbach's alphas appear on the diagonal, bivariate correlations appear below diagonal. Sex coded 0=male, 1=female

Table 2
Growth and cross-lagged parameters from the monitoring knowledge group models and tests of inequality for all parameters

	Monitoring knowledge groups		$\Delta\chi^2$ tests of inequality		
	Moderate-decline	High-increase	Full sample	Males	Females
Group means					
Friends' antisociality (FA) at age 13	16.68***	13.51***	48.84***	39.81***	15.56***
FA change	2.39***	1.67***	10.71**	8.57**	2.45
Delinquent behavior (DB) at age 13	0.19***	0.09***	50.63***	20.23***	27.89***
DB change	0.03***	0.02***	7.51**	6.78**	2.01
Correlations					
FA and DB levels at age 13	0.58**	0.65***	2.05	0.23	2.97
FA and DB rates of change ^a	0.88***	0.72***	Not tested		
FA at age 13 and change	0.39	-0.15	0.95	0.07	2.82
DB at age 13 and change	0.33	0.24	0.27	0.28	1.27
FA at age 13 and DB change	0.45	-0.19	3.17	1.40	1.85
DB at age 13 and FA change	0.38*	0.10	3.34	1.04	1.01
Cross-lag paths (standardized)					
FA to DB ^b			7.15**	1.50	4.64*
Age 13 to age 14	0.02	-0.08**			
Age 14 to age 15	0.03	-0.07**			
Age 15 to age 16	0.04	-0.07**			
DB to FA ^b			10.29**	7.74**	1.21
Age 13 to age 14	0.21***	-0.01			
Age 14 to age 15	0.22***	-0.01			
Age 15 to age 16	0.27***	-0.01			

^aIt was necessary to constrain the covariance between FA and DB rates of change to be equal in the two groups to fit the models.

^bUnstandardized cross-lag paths were constrained to be equal across the three time periods.

* $p < 0.05$

** $p < 0.01$

1000p