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# Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems

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## Abstract

A longitudinal, prospective design was used to examine the roles of peer rejection in middle childhood and antisocial peer involvement in early adolescence in the development of adolescent externalizing behavior problems. Both early starter and late starter pathways were considered. Classroom sociometric interviews from ages 6 through 9 years, adolescent reports of peers' behavior at age 13 years, and parent, teacher, and adolescent self-reports of externalizing behavior problems from age 5 through 14 years were available for 400 adolescents. Results indicate that experiencing peer rejection in elementary school and greater involvement with antisocial peers in early adolescence are correlated but that these peer relationship experiences may represent two different pathways to adolescent externalizing behavior problems. Peer rejection experiences, but not involvement with antisocial peers, predict later externalizing behavior problems when controlling for stability in externalizing behavior. Externalizing problems were most common when rejection was experienced repeatedly. Early externalizing problems did not appear to moderate the relation between peer rejection and later problem behavior. Discussion highlights multiple pathways connecting externalizing behavior problems from early childhood through adolescence with peer relationship experiences in middle childhood and early adolescence.

Childhood peer relationship experiences have long been recognized as correlates and predictors of a wide range of adjustment indices, including adolescent and adult antisocial behavior. Critical reviews of empirical research have indicated that rejection by one's peer group in childhood is associated with later maladjustment, especially externalizing behavior problems (Kupersmidt, Coie, & Dodge, 1990; Parker & Asher, 1987). Moreover, being rejected by one's peer group in middle childhood has been linked to subsequent involvement with antisocial peers during adolescence (e.g., Coie, Terry, Zakriski, & Lochman, 1995; Dishion, Patterson, Stoolmiller, & Skinner, 1991), which also has been identified as a correlate and possible precursor to antisocial outcomes (e.g., Simons, Wu, Conger, & Lorenz, 1994). However, it is unclear whether unsuccessful peer relationships during childhood and involvement with antisocial peers during adolescence represent successive stages of progression toward delinquency and criminality (Patterson, 1982), whether some characteristic or attribute of the individual underlies developmentally changing expressions of social maladaptation (Moffitt, 1993), or whether social rejection and deviant peer involvement represent different pathways to antisocial behavior. The goal of this study was to examine each of these possibilities using

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a prospective, longitudinal research design to trace the development of peer relationships and externalizing behavior problems from early childhood through early adolescence.

## Models of the Development of Antisocial Behavior

A number of typological models have been proposed hypothesizing multiple pathways to antisocial behavior (e.g., Loeber, 1990; Moffitt, 1993; Patterson, 1982). In recent years, the Developmental Taxonomy Model proposed by Moffitt and colleagues (Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996) and the Social Interaction Model described by Patterson and colleagues (Patterson, 1982; Patterson & Dishion, 1985, Patterson, Reid, & Dishion, 1992) have been among the most influential. Despite focusing on different distal causes and antecedents of early antisocial behavior, the two models have several common features. Perhaps the most significant shared feature is the recognition of multiple pathways to adolescent and adult antisocial behavior. Specifically, Moffitt (1993) distinguished between individuals on a life-course persistent trajectory who show an early emerging and stable tendency to engage in antisocial behavior and individuals on the adolescence-limited trajectory for whom antisocial behavior emerges during adolescence. Patterson, DeBaryshe, and Ramsey (1989) make a similar distinction between early starters and late starters focusing on when antisocial or criminal behavior first appears. The emphasis on differentiating between early starters and late starters is reflected in the classification system of the fourth edition of *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994), which distinguishes between childhood-onset and adolescent-onset conduct disorder.

Evidence suggests that early starters and late starters have different antisocial behavior profiles during childhood and early adulthood but that the two groups appear very similar during adolescence. After examining a range of factors, Moffitt et al. (1996) concluded that behavior problem data from childhood is needed to adequately differentiate between individuals following the two pathways because individuals on different pathways show similar behavior problem profiles during adolescence. It is important to be able to differentiate between individuals on the two pathways because evidence indicates that early starters, or individuals on the life-course-persistent trajectory, are at greater risk for various problems well into adulthood and that they are responsible for a disproportionate amount of criminal behavior from childhood through early adulthood (Coie & Dodge, 1998; Stattin & Magnusson, 1996).

Another similarity in the two developmental models is that both Moffitt and colleagues (1996) and Patterson and colleagues (1992) consider peer relationships during childhood and adolescence to have a role in either maintaining maladaptive behavior patterns or in promoting the development of maladaptive behavior patterns. In other words, peer relationship experiences may serve to maintain maladaptive behavior patterns among early starters on the life-course persistent pathway and serve to promote the development of behavior patterns among late starters or individuals on the adolescence-limited pathway (Patterson, Forgatch, Yoerger, & Stoolmiller, 1998). Although an increasingly wide range of peer relationship features (e.g., friendship presence, relationship qualities) at multiple levels (i.e., dyadic, group) are being evaluated as potential contributors to these processes (e.g., Hoza, Molina, Bukowski, Sippola, 1995; Kupersmidt, Burchinal, & Patterson, 1995; Laird, Pettit, Dodge, & Bates, 1999), most of the research attention has been focused on experiencing peer rejection in the early or middle childhood classroom and being involved with antisocial peers both in and out of school during adolescence. The purpose of this study is to further understand the roles of peer rejection and antisocial peer involvement in the externalizing problem maintenance and emergence processes.

## Peer Rejection

Parker and Asher (1987) discuss two general models that may account for the link between peer rejection in childhood and externalizing problems in adolescence. First, peer rejection may serve as a marker for some child characteristic or disturbance, and thus peer rejection and the subsequent antisocial behavior are not causally related. In this model, both peer rejection and maladjustment are the result of an underlying child characteristic—often expressed as a propensity to behave aggressively. Although some studies have found that peer rejection fails to predict later maladjustment after controlling for aggression (e.g., Kupersmidt & Coie, 1990), a number of other studies have described interactive models such that those children who are rejected by their peer group *and* who are highly aggressive or antisocial are most likely to experience adjustment problems (e.g., Coie, Terry, Lenox, Lochman, & Hyman, 1995; French, Conrad, & Turner, 1995; Hoza et al., 1995).

A second peer rejection model proposes that peer rejection causes or serves to maintain or accentuate antisocial behavior patterns developed in earlier relationships. Several different processes have been articulated to account for this causal relation. For example, Kupersmidt and colleagues (1990) suggest the possibility that socially rejected children may be deprived of beneficial peer experiences and fail to develop social and cognitive skills. Other researchers have found that rejected children often interact with other rejected children in play situations (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988), likely reinforcing one another's aggressive behavior. Yet another possibility is that the peer rejection experience may induce internal reactions (perhaps cognitive biases such as a hostility bias or low self-esteem) that contribute to adjustment problems later (for a review, see Rubin, Bukowski, & Parker, 1998).

In Patterson's Social Interaction Model, affiliation with antisocial peers is thought to mediate the link between peer rejection in childhood and later maladjustment. Thus, in the current study peer rejection in middle childhood was hypothesized to be a predictor of antisocial peer involvement during early adolescence and of adolescent externalizing behavior problems. A number of studies have documented links between peer rejection and later externalizing behavior (see Kupersmidt et al., 1990; Parker & Asher, 1987, for reviews). Fewer studies have linked peer rejection to later affiliation with antisocial peers (e.g., Coie, Terry, Zakriski, & Lochman, 1995; Dishion et al., 1991; Fergusson, Woodward, & Horwood, 1999), and the time period between the assessment of rejection and antisocial peer affiliation in those studies generally has been shorter than the time period in the current study. Furthermore, in the present study adolescent externalizing problems were hypothesized to be most common among rejected–aggressive children. However, because both aggressive and nonaggressive rejected children are expected to have limited peer interaction opportunities, it is unclear whether rejected–aggressive children will be more likely to affiliate with antisocial peers during early adolescence than rejected–nonaggressive children will.

## Antisocial Peer Involvement

Two models similar to the peer rejection models have been offered as interpretations of the link between involvement with antisocial peers and maladjustment. The first model is based on the assertion that a child characteristic (such as a tendency to engage in aggressive or disruptive behavior) leads both to involvement with antisocial peers and to maladaptive outcomes such as delinquency or criminality (Gottfredson & Hirschi, 1990). This model is analogous to the first peer rejection model. Evidence that similarity between adolescent friends is accounted for by selection (i.e., antisocial adolescents tend to become friends with one another) rather than peer influence processes is consistent with this model (e.g., Tremblay, Masse, Vitaro, & Dobkin, 1995). A second model proposes that antisocial or delinquent peers influence the behavior of adolescents in ways that promote delinquent activity. The peers are

assumed to exert this influence through modeling processes, by reinforcing antisocial attitudes, or by providing opportunities to engage in misbehavior. Dishion and colleagues (Dishion, Andrews, & Crosby, 1995; Dishion, Capaldi, Spracklen, & Li, 1995) have described interactions though which antisocial adolescents discuss rule breaking as confluence processes (i.e., the adolescents encourage one another's rule-breaking behaviors) and have shown these processes to be relevant to antisocial behavior and to substance use. Increases in antisocial behavior after becoming involved with delinquent or antisocial peers are consistent with the influence model (e.g., Keenan, Loeber, Zhang, Stouthamer–Loeber, & Van Kammen, 1995). In the current study, involvement with antisocial peers in early adolescence is hypothesized to predict externalizing problems in later adolescence.

## Unified Model

In addition to testing the bivariate main effects of peer rejection and antisocial peer affiliation, two versions of a multivariate developmental model will be tested. The basic model, shown in Figure 1a, is a sequential mediation model proposing that antisocial behavior in the preschool years is a precursor to peer rejection in middle childhood, which in turn is a precursor to subsequent affiliation with antisocial peers. Affiliation with antisocial peers predicts externalizing behavior problems in adolescence. Paths permitting additional direct effects are also included as part of the model. This model provides a means to test two mediation paths. Specifically, peer rejection is hypothesized to mediate the relation between early antisocial behavior (i.e., externalizing problems) and affiliation with antisocial peers, and antisocial peer affiliation is hypothesized to mediate the relation between peer rejection and adolescent externalizing behavior.

A more complete model also will be tested (Figure 1b). This model builds on the first model by including indices of externalizing behavior concurrent with peer rejection and antisocial peer affiliation experiences. This model will provide evidence of additive effects from peer rejection and antisocial peer affiliation controlling for externalizing behavior at all preceding time points. This is a very conservative model, and findings of significant unique contributions from peer rejection or antisocial peer affiliation to the prediction of adolescent externalizing problems would be impressive. In essence, this model provides a test of whether peer rejection or antisocial peer affiliation predicts externalizing behavior problems after accounting for long-term and short-term stability in externalizing behavior. Significant unique contributions from peer rejection or antisocial peer affiliation may indicate that these experiences play a role in the development of externalizing behavior problems during adolescence as shown by individuals in the late-starter and adolescence-limited pathways. However, a lack of unique contributions does not rule out the possibility that these peer experiences may serve to maintain antisocial behaviors among previously antisocial individuals (i.e., early starters and individuals following the life-course-persistent pathway).

The pathways illustrated by the developmental models will be examined using both person-centered and variable-centered approaches. Stattin and Magnusson (1996) argue that a holistic approach is needed to understand the development of antisocial behavior and that a reliance on variable-centered approaches alone may make multiple pathways indistinguishable. For example, substantial stability in the externalizing behavior of the early starters may make it difficult to identify the contribution of antisocial peer involvement to the development of behavior problems among the late starters. The person-centered analysis identifies individuals who appeared to be following different developmental trajectories and examines the peer relationship experiences across the different trajectory groups.

The final issue examined in this study is the generalizability of the proposed developmental models to the development of both boys and girls. Sex differences in mean levels of antisocial

behavior problems are widely recognized (see Coie & Dodge, 1998) and result in girls being excluded from many studies of antisocial behavior development. However, when data from boys and girls are analyzed separately, there can be different conclusions for boys and girls (e.g., Coie, Terry, Lenox, et al., 1995). Moreover, when sex has been explicitly tested as a moderator (i.e., Predictor × Sex Interaction), differences in specific parenting (e.g., McFayden–Ketchum, Bates, Dodge, & Pettit, 1996) and peer relationship (e.g., Kupersmidt, Burchinal, & Patterson, 1995; Laird et al., 1999) processes predicting antisocial behavior development have been identified. It is not clear, however, whether sex differences are so pervasive as to indicate the need for different models for boys and girls. In the current study, multiple-group modeling was used to assess the generalizability of a single developmental model to the externalizing problems and peer relationship difficulties of both boys and girls.

## Method

### Participants

Participants were drawn from the ongoing Child Development Project, a multisite longitudinal study of children's and adolescents' adjustment (see Dodge, Bates, & Pettit, 1990; Pettit, Bates, & Dodge, 1997). Participating families were initially recruited from three geographical areas (Nashville and Knoxville, Tennessee, and Bloomington, Indiana) during kindergarten preregistration during the summers of 1987 and 1988. A total of 585 families are included in the study sample. At the time of recruitment, 52% of the children were male, 19% were of minority ethnic background, and 26% lived with single parents. The Hollingshead (1975) Four-Factor Index of Social Status was computed from demographic information provided by the parents. The mean family score on the index was 39.5 (*SD* = 14.0); however, there was a wide range in socioeconomic status (SES; from 8 to 66). Data analyzed in the current study were collected during the first 9 years of the Child Development Project.

### Procedure

Informed consent to contact the families and to obtain information from the adolescents' teachers and schools was obtained from parents on a yearly basis. Sociometric interviews were conducted in the children's classrooms, kindergarten through third grade, and provided indices of peer rejection. Study participants were contacted in seventh grade and asked to participate in a structured interview. The interviews included two sections of questions assessing the adolescents' involvement with antisocial peers and their own problem behavior. These questions were embedded into a larger assessment of peer relationships described elsewhere (see Laird et al., 1999). Parents completed a standard problem behavior inventory each summer, and teachers were contacted yearly and asked to complete a set of instruments selected to evaluate the behavior of study participants.

### Measures

**Peer rejection—**Sociometric interviews were conducted in the winter of each school year where there was parental permission for at least 70% of the children in the classroom. The protocol generally followed the procedure described by Coie, Dodge, and Coppotelli (1982). In either face-to-face or classroomwide assessments, each child was shown the names or photographs of all classmates and asked to nominate the three classmates they like to play with the most and the three classmates they like to play with the least. Frequencies of liking (like most) and disliking (like least) nominations were tabulated for each child and standardized within classrooms. A social preference score was computed as the standardized difference between the liking and disliking scores. Children were classified as rejected according to Coie et al.'s criteria if they had social preference scores less than −1, standardized liking scores below 0, and standardized disliking scores greater than 0. Children were classified as rejected or not rejected in kindergarten, first, second, and third grades. To minimize the impact of missing

peer rejection data, a single index of "peer rejection" was computed as the proportion of available years in which the child was classified as rejected (α = .64).[1] Twenty-five percent of the children were rejected in one or more school years (14% in 1 year only, 7.5% in 2 years, 2.4% in 3 years, and .7% in all 4 years). Means and standard deviations for all variables are shown in Table 1.

**Antisocial peer involvement—**Adolescent peer antisocial behavior was indexed for both dyadic best friendships and for friendship groups. Adolescents were asked to name their best friend and to complete five items referring to the best friend's antisocial behavior taken from Dishion et al. (1991). The five items (i.e., "my friend (a) gets into trouble at school, (b) lies to his/her parents and teachers, (c) uses bad language, (d) gets into fights with other kids, and (e) likes to do things that make me scared or uncomfortable") were rated on a 3-point scale (*not true, somewhat/sometimes true, very/often true*). A friend antisocial behavior score was created by taking the mean rating for the five best friend items (α = .69).

Adolescents who identified themselves as members of a friendship group (i.e., reported spending more of their free time at school with a group of friends than alone or with a single best friend; 87% of the sample) were asked to complete a similar set of items for their friendship group members. The behaviors were the same behaviors used to index best friend antisocial behavior but the group items appeared in a slightly different format (i.e., "my friend" was replaced with "the members of my group") and were scored on a 5-point scale (*never, once in a while, sometimes, fairly often, very often*). A group antisocial behavior score was created by taking the mean rating for the five group items (α = .74). A composite antisocial peer involvement variable was computed as the mean of the standardized best friend and group antisocial behavior scores (2-item α = .73). Note that group nonmembers did not have a group antisocial behavior score; thus, their peer antisocial behavior score represents dyadic friendships only.

**Externalizing behavior problems—**Each summer parents were asked to complete the Child Behavior Checklist (CBC; Achenbach, 1991a). Likewise, in the spring of each school year, participants' teachers were asked to complete the Teacher's Report Form (TRF; Achenbach, 1991b). Adolescents were asked to complete the Youth Self-Report (YSR; Achenbach, 1991c) in the winter of seventh grade (age 13 years) and again during the summer following eighth grade (age 14 years). All three instruments are standard checklists of child and adolescent behavior problems and have been shown to be reliable and valid indicators of problem behavior during childhood and adolescence. The externalizing problems scale of the CBC, TRF, and YSR includes 33, 34, and 30 items, respectively. The externalizing items index both aggression and delinquent behaviors. Each item is rated as *not true* for the child (scored 0), *somewhat true* (scored 1), or *very true* (scored 2). *T* scores, normed within age and gender, with a national mean of 50 and standard deviation of 10 were used to create indices of externalizing behavior problems for four developmental eras. Because only parent reports were available prior to kindergarten, the age 5 years CBC externalizing *T* score serves as the index of "age 5 years externalizing behavior problems." Both CBC and TRF *T* scores were available each year for ages 6–9 years (i.e., corresponding to the time period for which peer rejection status is available). CBC (α = .91) and TRF (α = .84) age 6–9 years composite scores were created by computing the mean values over the 4 years. The mean of the TRF and CBC composites serves as the index of "age 6–9 years externalizing behavior problems" (2-item α = .58; 8-item α = .87). CBC, TRF, and YSR scores are available for ages 13 and 14 years. The mean of the three age 13 years externalizing *T* scores serves as the index of "age 13 years

[1]Seventy-five percent of the participants had no missing peer rejection scores, and greater than 92% of the participants had fewer than two missing peer rejection scores.

adolescent externalizing behavior problems" (α = .60, all *r*s > .31), and the mean of the age 14 years externalizing *T* scores serves as the index of "age 14 years externalizing behavior problems" (α = .67, all *r*s > .32). To maximize the number of participants included in analyses, scores involving multiple years or informants were computed as the mean value of all available data.[2]

## Results

### Attrition

Childhood and adolescent peer relationship data were available for 73% of the original sample (*n* = 429), and complete data were available for 68% of the original sample (*n* = 400). In terms of demographic background, participants with complete data came from slightly higher SES homes (*M* = 40.7, *SD* = 14.1) than participants with incomplete data (*M* = 36.9, *SD* = 13.5), *t* (568) = 3.05, *p* < .01; participants with complete data were less likely to be African American (15% vs. 21%), $\chi^2$ (1, *n* = 585) = 3.96, *p* < .05, and showed a tendency to be more likely to be female (51% vs. 43%), $\chi^2$(1, *n* = 585) = 3.74, *p* < .06. Participants with complete data were just as likely to live with a single parent at initial recruitment as were participants with incomplete data (23% vs. 28%), $\chi^2$(1, *n* = 585) = 1.60, *p* > .20.

Participants with peer rejection data but not complete data (*n* = 180) had a tendency to be rejected by peers more often than participants with complete data (*M*s = .14 and .10; *SD*s = .25 and .22), *t* (578) = 1.73, *p* < .09. Participants with antisocial peer involvement data but not complete data (*n* = 31) did not differ from participants with complete data in terms of antisocial peer involvement (*M*s = −.01 and −.09; *SD*s = .92 and .82), *t* (429) = .52, *p* > .60. Finally, participants with complete data did not differ from participants with incomplete data in terms of externalizing behavior problems at ages 5, 6–9, 13, or 14 years (all *p*s > .12). All analyses described below were performed using the portion of the sample with complete data (*n* = 400).

### Overview

The first step in the analysis was to compute bivariate correlations among the peer relations and behavior problem variables and to test the matrix of bivariate relations for gender differences. Next, path analyses were conducted to fit the basic and more complete path models. The path analyses were supplemented by exploratory analyses to more fully address the variability in peer rejection experiences. Finally, a person-centered analysis was undertaken to determine whether the path models obscure subgroups following different developmental trajectories.

### Bivariate relations

The extent to which the relations among peer rejection, antisocial peer involvement, and childhood and adolescent externalizing problems are moderated by child sex was tested by comparing covariance matrices as recommended by Rowe, Vazsonyi, and Flannery (1994). Covariance matrices including the peer relationship and externalizing problems variables were computed separately for boys and girls. A model with constraints equating covariances among the two gender groups provided a good fit to the data with an adjusted goodness-of-fit (AGFI) index of .98, a comparative fit index (CFI) of 1.0, and a nonsignificant chi-square, $\chi^2$(15, *n* = 400) = 7.93, *p* = .93. This approach is analogous to an omnibus *F* test, and the results indicate that child gender does not systematically moderate the set of relations among peer rejection, antisocial peer involvement, and externalizing behavior problems. Moderation by child gender was not considered further. Although gender main effects are likely to be present in these

[2]Fifty-one percent of the participants had no missing externalizing problems scores, and greater than 93% of the participants were missing fewer than three scores.

variables (see Keiley, Bates, Dodge, & Pettit, 2000; Laird et al., 1999), they were not of interest in this study.

Table 1 contains descriptive information and the bivariate correlations among childhood peer rejection, adolescent antisocial peer involvement, and childhood and adolescent externalizing problems. The correlations show a modest relation between peer rejection and antisocial peer involvement and somewhat stronger relations between the peer experiences variables and the externalizing problems scores. Correlations among the externalizing problems scores are generally strong, with relations weakening somewhat over time. Bivariate correlations relevant to the study hypotheses are discussed in the following sections.

## Path models

Path analysis was used to test the five primary hypotheses. Path analysis was chosen over latent variable modeling to maximize the number of participants that could be included in the analyses. Moreover, because variables representing each construct of interest were created from multiple informants when available, latent variable modeling offered limited advantages. The basic path model is shown in Figure 1a. The basic model proposes that experiences in one developmental era predict experiences in all subsequent eras. Paths of primary interests include paths linking (a) age 5 years externalizing problems to peer rejection at ages 6–9 years, (b) peer rejection to antisocial peer involvement at age 13 years, and (c) antisocial peer involvement to externalizing problems at age 14 years. The relation between age 5 years externalizing problems and antisocial peer involvement was expected to be at least partially mediated by peer rejection. Likewise, the relation between peer rejection and age 14 years externalizing problems was expected to be at least partially mediated by antisocial peer involvement. Error terms for peer rejection, antisocial peer involvement, and age 14 years externalizing problems were included in the models but are not shown in the figures. Because the model is fully saturated, error terms were not allowed to covary.

The second, and more complete, path model is shown in Figure 1b. This model adds externalizing problems at ages 6–9 and 13 years to the basic model. The purpose of the complete model is to determine whether peer rejection or antisocial peer involvement explains variance in age 14 years externalizing behavior after controlling for stability in externalizing behavior over time. Again, this model proposes that experiences in each developmental era predict experiences in subsequent eras. Primary paths of interest include paths linking peer rejection and antisocial peer involvement to age 14 years externalizing behavior problems. Error terms for peer rejection, antisocial peer involvement, and externalizing problems at ages 6–9, 13, and 14 years were included in the model but are not shown in Figure 1. Two sets of error terms (i.e., between peer rejection and ages 6–9 years externalizing problems, and between antisocial peer involvement and age 13 years externalizing problems) were allowed to covary. Allowing these error terms to covary was necessary to capture covariation between concurrently assessed experiences that is not shared with common antecedents included in the model.

Initially, all paths were estimated in both models. Subsequent analyses worked to identify more parsimonious models by dropping paths that did not significantly alter the fit of the models. Dropped paths were selected by working from earlier experiences to later experiences. The model was refit after dropping each path, but only the final model will be presented.

**Mediation—**Mediation was evaluated using Baron and Kenny's (1986) three criteria. The criteria are significant associations between (a) the independent and dependent variables, (b) the independent variable and the mediator, and (c) the mediator and the dependent variable. Moreover, a reduction in the association between the independent and dependent variable after accounting for the relation between the mediator and dependent variable is necessary for

mediation. The statistical significance of the indirect effect associated with each mediation hypothesis also was tested as recommended by MacKinnon and Dwyer (1993).

**Basic model—**Path values for the basic model are shown in Figure 2a. Generally, experiences in each era predicted experiences in each subsequent era, with the exception that age 5 years externalizing problems did not predict antisocial peer involvement at age 13 years. The path from age 5 years externalizing problems to antisocial peer involvement was dropped without adversely effecting the fit of the model, $\chi^2_{\text{diff}}$ (1, $n$ = 400) = 1.31, $p$ = .25. The final model is shown in Figure 2b. Externalizing problems at age 5 years predicted subsequent peer rejection at ages 6–9 years and externalizing problems at age 14 years. As hypothesized, peer rejection experiences predicted antisocial peer involvement and age 14 years externalizing problems, and antisocial peer involvement predicted age 14 years externalizing problems. The lack of a bivariate correlation between age 5 years externalizing and antisocial peer involvement rules out peer rejection as a mediator of this relation. Likewise, evidence is inconsistent with antisocial peer involvement as a mediator of the relation between peer rejection and age 14 years externalizing problems. Specifically, although there is a significant bivariate correlation between peer rejection and age 14 years externalizing problems, and the indirect path from peer rejection to age 14 years externalizing problems through antisocial peer involvement is significant, $T$(400) = 2.24, $p$ < .05, and the reduction in the strength of the direct path from peer rejection to age 14 years externalizing problems after accounting for the indirect path is minimal (i.e., from .33 to .30).

**Complete model—**Path values for the complete model are shown in Figure 3a. There is substantial rank–order stability in externalizing problems across eras. Age 5 years externalizing problems predicted subsequent peer rejection, and externalizing problems at ages 6–9 years predicted subsequent antisocial peer involvement. Peer rejection, but not antisocial peer involvement, predicted subsequent externalizing problems. A number of paths were removed from the model. Three paths from age 5 years externalizing problems (to antisocial peer involvement, age 13 years externalizing, and age 14 years externalizing) were removed from the model without adversely effecting the model fit, $\chi^2_{\text{diff}}$ (3, $n$ = 400) = 2.72, $p$ > .40. Likewise, two paths from peer rejection (to antisocial peer involvement and age 14 years externalizing) were removed from the model, $\chi^2_{\text{diff}}$ (2, $n$ = 400) = 2.02, $p$ > .30. Finally, the path from antisocial peer involvement to age 14 years externalizing was removed, $\chi^2_{\text{diff}}$ (1, $n$ = 400) = 1.03, $p$ > .20.

The final model is shown in Figure 3b. Externalizing problems at age 5 years predicted subsequent peer rejection at ages 6–9 years and externalizing problems at ages 6–9 years. Peer rejection predicted age 13 years externalizing behavior problems and externalizing problems at ages 6–9 years predicted antisocial peer involvement. Age 14 years externalizing problems were predicted by earlier externalizing problems only. Peer rejection but not antisocial peer involvement predicted subsequent externalizing behavior problems after accounting for developmental stability in externalizing behavior problems. The link between peer rejection and age 14 years externalizing problems appears to be mediated by age 13 years externalizing problems. The significant relation between peer rejection and age 14 years externalizing problems is substantially reduced (from .10 to .05) when age 13 years externalizing problems is included as a mediator. Moreover, the indirect path from peer rejection to age 14 years externalizing problems through age 13 years externalizing problems is significant, $T$(400) = 2.42, $p$ < .05.

## Impact of peer rejection

**Chronic peer rejection—**Exploratory analyses were conducted to address two issues. The first issue was whether chronic peer rejection was more predictive of later antisocial peer

involvement and externalizing problems than rejection experienced in a single year. One-way analyses of variance (ANOVAs) with post hoc least significant difference tests were used to compare the antisocial peer involvement and age 13 and 14 years externalizing problems of participants who never experienced peer rejection ($n$ = 309) and participants who experienced peer rejection in 1 year only ($n$ = 49), in 2 years ($n$ = 28), or in 3 or 4 years ($n$ = 13).

There was a significant difference among the groups in antisocial peer involvement, age 13 years externalizing problems, and age 14 years externalizing problems, respective Fs (3, 396) = 2.63, 25.82, and 20.38, all $p$s < .05. Participants experiencing peer rejection in 1 or 2 years ($M$s = .23 and .34; $SD$s = .98 and 1.12) reported being more involved with antisocial peers than individuals who never experienced peer rejection ($M$ = −.08, $SD$ = .87) whereas participants experiencing peer rejection in 3 or 4 years were not significantly different than any other group ($M$ = .14, $SD$ = 1.04). Moderate peer rejection experiences appear to be most consistently predictive of later antisocial peer involvement.

In terms of externalizing problems, participants never experiencing peer rejection ($M$ = 49.8, $SD$ = 6.6) had fewer externalizing problems than all other groups at age 13 years. The group experiencing peer rejection once ($M$ = 54.3, $SD$ = 6.0) had fewer age 13 years externalizing problems than those experiencing peer rejection twice did ($M$ = 59.1, SD = 6.0). Although the group experiencing peer rejection three or four times had the highest age 13 years externalizing problem mean (60.0, $SD$ = 6.6), this group did not differ from participants experiencing peer rejection once or twice. This pattern was also found for age 14 years externalizing problems. The groups experiencing peer rejection two or three times were equivalent, but all other group comparisons were significant. The never group had the lowest mean (49.3, $SD$ = 7.8) followed by the once group ($M$ = 54.0, $SD$ = 7.8), the twice group ($M$ = 58.5, $SD$ = 8.8) and the three or four times group ($M$ = 59.8, $SD$ = 12.3). The overall pattern suggests that chronic peer rejection is more predictive of later behavior problems than is experiencing peer rejection only once. However, a single peer rejection experience appears sufficient to elevate externalizing problems to some degree.

**Rejected–externalizing—**The second issue addressed in exploratory analyses centered on whether peer rejection is more predictive of peer antisocial involvement and externalizing problems for children who are aggressive. To remain consistent with prior analyses, externalizing problems at ages 6–9 years served as the indicator of aggressive behavior during middle childhood. Interactions between continuous peer rejection and externalizing problems scores were evaluated using multiple regression procedures with interaction terms (see Jaccard, Turisi, & Wan, 1990). The interaction term was not a significant predictor of antisocial peer involvement or age 13 or age 14 years externalizing problems (all $p$s > .12). To evaluate the interaction at the dichotomous level, the externalizing problems score at ages 6–9 years was used to identify high (top quartile, $n$ = 103) and low (bottom quartile, $n$ = 100) externalizing problems groups. The dichotomous index of peer rejection (i.e., ever vs. never) served as the index of peer rejection. These two variables were included in 2 × 2 ANOVAs with antisocial peer involvement, age 13 years externalizing problems, and age 14 years externalizing problems serving as dependent variables. Again, the interaction terms were not significant (all $p$s > .24). From these analyses, it does not appear that peer rejection is more predictive of antisocial peer involvement and later externalizing problems for high-aggression children than for low-aggression children.

**Person-centered analyses—**Because multiple pathways may be obscured in the path models, exploratory person-centered analyses were conducted. In the first step, individuals were classified into trajectory groups based on their externalizing problems profiles. Cut points were used to classify individuals as “high externalizing” during each developmental era. Note that the cut points represent relatively high externalizing scores within a normal population

rather than clinically significant externalizing scores. Because averaging over multiple informants tends to reduce variation and brings extreme scores closer to the scale mean (i.e., regression to the mean), a cutoff score of 55 was used for classifying participants as "high externalizing" at ages 6–9, 13, and 14 years. The cutoff of 60 was used for the age 5 years score because this score was derived from a single informant at a single time point. At each era, 25–30% of the sample was classified as high externalizing. Four trajectory patterns, classifying 70% of the sample, were identified using the externalizing scores from the four developmental eras. Members of the "never" group ($n$ = 193) were in the low externalizing group at all four time points; members of the "increasing" group ($n$ = 24) were in the low externalizing group at ages 5 and 6–9 years, but in the high externalizing group at ages 13 and 14 years; members of the "decreasing" group ($n$ = 29) were in the high externalizing group at ages 5 and 6–9 years, but in the low externalizing group at ages 13 and 14 years; members of the "always" group ($n$ = 33) were in the high externalizing group at all four time points.

A similar procedure was used to classify peer relationship experiences. Because 25% of the sample was rejected by their peer group in one or more years, the cutoff score for antisocial peer involvement was selected to classify the highest 25% of scores into the high antisocial peer involvement group. Table 2 presents the percentage of each externalizing trajectory group experiencing peer rejection, high levels of antisocial peer involvement, and both peer rejection and high levels of antisocial peer involvement. Four comparisons are of primary interest. First, peer rejection was most common among the "always" and "decreasing" groups suggesting that peer rejection is experienced by individuals showing early externalizing problems. Second, high levels of antisocial peer involvement was most characteristic of the "increasing" and "always" groups and less common among the "decreasing" group. Third, members of the "always" group were most likely to experience both peer rejection and high levels of antisocial peer involvement. Finally, among the individuals in the "never" group, the combination of peer rejection and antisocial peer involvement rarely was experienced.

## Discussion

Results from the current study suggest that there are multiple pathways to adolescent externalizing behavior problems from childhood externalizing behavior problems, childhood peer rejection, and adolescent antisocial peer involvement. Early externalizing problems, peer rejection in childhood, and greater involvement with antisocial peers in early adolescence all were associated with adolescent externalizing problems, and each accounted for some variance in externalizing problems not shared with the other two. After accounting for rank–order stability in externalizing behavior, peer rejection, but not antisocial peer involvement, predicted externalizing problems in subsequent developmental eras. However, peer rejection and high levels of antisocial peer involvement were relatively more common among the adolescents with consistently high levels of externalizing problems than among the remaining adolescents.

Although a number of studies have documented sex differences in mean levels of antisocial behavior problems (see Coie & Dodge, 1998), less evidence suggests that peer experiences contribute to the development or maintenance of externalizing problems differently for boys and girls. Kupersmidt and colleagues (1995) tested a number of Peer Experience × Sex interactions, reporting that more supportive friendships and friendships characterized by less conflict predicted lower levels of aggression more strongly for boys than for girls. However, Kupersmidt et al.'s (1995) results indicate more consistency than discrepancy between the sexes in the relations between peer experiences and aggression and delinquency. Likewise, an earlier analysis of a slightly different operationalization of the antisocial peer involvement variable used in the current data set found that although antisocial peer involvement was a strong predictor of self-reported delinquent behavior for both boys and girls, the prediction was stronger for girls than boys (Laird et al., 1999).[3] A more conservative analysis approach

undertaken in the current study provided no evidence that the set of relations among the peer relationship and behavior problem indices are moderated by sex. Results from this study indicate that sex differences are more likely to function as an elaboration of a general process that is generally applicable to both boys and girls. This homogenous pattern replicates results recently reported by Fergusson et al. (1999), who found that the relations among childhood peer relationship problems, involvement with antisocial peers in adolescence, and conduct problems were not moderated by child sex.

Three main effects hypotheses, one moderation hypothesis, and two mediation hypotheses were tested in the path models. Results provided modest support for the main effects hypotheses but little support for the moderation and mediation hypotheses. Specifically, peer rejection was associated with later adolescent involvement with antisocial peers, a finding that echoes earlier short-term longitudinal findings (e.g., Coie, Terry, Zakriski, & Lochman, 1995; Dishion et al., 1991). However, this relation, when traced from early elementary school to middle school in the current study, was only of modest magnitude, suggesting that most rejected children do not become highly involved with antisocial peers. Moreover, after controlling for early externalizing problems, peer rejection no longer predicted antisocial peer involvement. This finding echoes similar results reported by Fergusson and colleagues (1999) in that stability in behavior problems from childhood to adolescence accounts for the link between peer rejection and antisocial peer involvement. However, it was somewhat surprising that moderate levels of peer rejection were most predictive of antisocial peer involvement. Children who were chronically rejected were not as likely to become involved with antisocial peers as were children who were rejected in one or two school years. This pattern may be evidence that 1 or 2 years of peer rejection may limit friendship opportunities but that consistent and repeated peer rejection experiences may make the formation and maintenance of friendships, even with other rejected peers, nearly impossible. Support for this interpretation was found by reexamining the group antisocial behavior variable. The reexamination revealed a negative correlation between the proportion of years rejected and whether the adolescents completed the group antisocial behavior items. A closer inspection revealed that children experiencing rejection repeatedly were less likely than other children to report spending their free time at school with a group of friends several years later during early adolescence.

Also replicating a number of earlier studies (for reviews, see Kupersmidt et al., 1990; Parker & Asher, 1987; Rubin et al., 1998), peer rejection was found to be associated with adolescent externalizing problems. This relation remained significant after controlling for childhood externalizing problems, suggesting that peer rejection may lead to an escalation of behavior problems that persists into adolescence. Prior analyses with this dataset have revealed that there is an escalation in mother-reported but not teacher-reported externalizing problems (Keiley et al., 2000). Antisocial peer involvement also was associated with later behavior problems. However, associations between behavior problems and antisocial peer involvement failed to remain significant, controlling for stability in externalizing behavior. Weak measurement of antisocial peer involvement may account for the nonsignificance of these paths. In contrast to the link between peer rejection and antisocial peer involvement, more consistent rejection experiences were associated with more externalizing behavior problems in adolescence. Although a single peer rejection experience appears to be associated with escalation in externalizing problems, the most severe externalizing problems were found among the children who were consistently rejected by their peer group during middle childhood. It does appear from the positive correlation between age 5 years externalizing problems and peer rejection that early behavior patterns may have contributed to the consistent rejection experiences. Nonetheless, rejection contributed to the prediction of later externalizing problems, controlling

[3]In Laird et al. (1999), the best friend and group antisocial behavior scores were analyzed in separate analyses. In both analyses, peer antisocial behavior was more predictive of later self-reported delinquent behavior for girls than for boys.

for both concurrent and earlier behavior problems, indicating that there is something uniquely predictive about the peer rejection experience.

Contrary to expectation, peer rejection was not a stronger predictor of later problems among children showing early externalizing problems. The long-term impact of peer rejection therefore is not limited to an escalation of behavior problems among already troubled children. The impact of peer rejection appears to be much more pervasive. However, past studies (e.g., Coie, Terry, Lenox et al., 1995; French et al., 1995; Hoza et al., 1995) have shown the impact of peer rejection to be moderated by aggressive behavior (typically peer-reported aggressive behavior) rather than the more global measure of externalizing behavior problems used in this study. Perhaps peer-reported aggressive behavior is more closely linked to the cause of peer rejection than is externalizing problems. The relevant feature may be the cause of the rejection rather than the child's predisposition or susceptibility to engage in certain types of behavior. Another possibility is that peer reports of aggression may be more predictive of consistent peer rejection experiences, which were found to be related to more elevated levels of externalizing behavior problems in this study.

Evidence of mediation effects also was lacking. There was no relation between early externalizing problems and later antisocial peer involvement for peer rejection to mediate. Furthermore, the relation between peer rejection and later externalizing problems was not mediated by antisocial peer involvement. A single developmental pathway from early externalizing problems to peer rejection to antisocial peer involvement to later externalizing problems is not consistent with the data. Instead, the data provide only a weak link between peer rejection and antisocial peer involvement and a nonsignificant link between early externalizing problems and antisocial peer involvement. This pattern suggests that multiple pathways link early externalizing problems and subsequent peer experiences to later externalizing problems.

### Multiple pathways

Taken as a whole, the results of this study suggest several pathways from childhood to adolescent externalizing problems and provide evidence that peer relationship experiences may play a role in guiding a child down a particular pathway. The pathways are best illustrated by the person-focused analyses. The first two pathways originate with high levels of externalizing problems in early childhood. Over half of the children who were classified as “high externalizing” during childhood remained high in externalizing behavior problems through early adolescence. This group appears to be following a trajectory similar to Moffitt's (1993) life-course-persistent group and Patterson et al.'s (1989) early-starter group. Nearly two thirds of the children who did remain high in externalizing problems experienced peer rejection in childhood, and over one third were highly involved with antisocial peers during adolescence. Thus, for a substantial portion of the consistently high externalizing group, negative peer experiences appear to maintain early behavior patterns through childhood and into adolescence. These results are consistent with Patterson et al.'s (1998) report that involvement with antisocial peers discriminated between early starting individuals who continued along the pathway toward adult criminality and those who did not. Thus, it seems possible that involvement with antisocial peers functions to maintain childhood externalizing behavior patterns into adolescence.

The second pathway is illustrated by the 40% of the children classified as “high externalizing” during childhood who experienced a reduction in externalizing problems by adolescence. Although these children are still overrepresented in terms of peer rejection and antisocial peer involvement, the likelihood of rejection or high levels of antisocial peer involvement is much lower among this group than among the consistently high externalizing group. The difference in the peer experiences of the childhood high externalizers who do versus do not show high

levels of externalizing problems in adolescence provides evidence that peer experiences may help to channel a child into a particular pathway.

The children showing more modest levels of externalizing problems during childhood represent the third and fourth pathways. The third pathway is represented by the group of children who appear to experience an increase in externalizing problems as shown by high levels of externalizing problems during adolescence. For about 30% of this group, the escalation in externalizing behavior problems is anteceded by peer rejection experiences, and for over 50% of this group the escalation in behavior problems is anteceded by involvement with antisocial peers. Although both peer rejection experiences and antisocial peer involvement serve as on-ramps to this pathway, the peer rejection experiences appear to be most strongly and consistently linked to later externalizing problems. This third pathway appears to capture the essence of the late-starter pathway described by Patterson et al. (1989) and the adolescence-limited pathway described by Moffitt (1993). However, Patterson et al.'s (1992) stronger emphasis on the role of peer rejection rather than Moffitt's (1993) emphasis on antisocial peer involvement appears to be most consistent with the data presented in this study.

The fourth and final pathway is illustrated by a majority of the participants in this study who exhibited few externalizing problems during childhood and adolescence. This group was unlikely to be rejected by their peers in childhood or to be involved with antisocial peers in early adolescence. Again, the substantial differences in the peer relationship experiences characterizing this pathway when compared with the experiences typical of other pathways highlights the relevance of peer experiences in guiding a child into a particular externalizing behavior problem pathway.

## Limitations and conclusions

As in many prospective longitudinal studies, data were available at all time points on only a portion of the original sample. Consequently, these results may underrepresent the diversity of pathways to adolescent externalizing problems, particularly early-starter pathways, and may underestimate the magnitude of the predictor variables. However, these data are valuable because they do provide an opportunity to test prospective developmental hypotheses. Without the prospective data, for example, we would not be able to ask what portion of rejected children become involved with antisocial peers in early adolescence—a question central to this study.

Another limitation is the reliance on adolescent reports of antisocial peer involvement. Although researchers often ask adolescents to report on their friends' behavior (e.g., Chassin, Presson, Todd, Rose, & Sherman, 1998), this practice may bias results by providing evidence of stronger or weaker associations between peer relationship experiences and behavior problems than would be found using multi-informant measures (Fisher & Bauman, 1988). In the current study, because peer rejection and externalizing behavior problems were measured more comprehensively (i.e., multiple informants over multiple years), the contribution of antisocial peer involvement to the development and maintenance of behavior problems may be underestimated, particularly when contrasted with the contribution of peer rejection.

The final major limitation of this study is that the peer relationship variables were rather limited and were collected in different developmental eras. An increasingly diverse array of peer relationship variables are currently being studied, and future efforts to link peer relationship experiences to maladjustment should consider additional peer relationship dimensions at the dyadic and group level such as friendship qualities and crowd membership. Moreover, peer rejection experiences are not limited to middle childhood. Although more complicated to assess and somewhat more ambiguous in meaning due to the lack of a single classroom-based reference group, peer rejection experiences during adolescence also should be considered. Likewise, the particular individuals that a child chooses to become friends with are likely to

influence the child's behavioral development during childhood as well as during early adolescence (Hartup, 1996). Although more attention has been focused on antisocial peer involvement during adolescence, involvement with antisocial peers during childhood should also be evaluated as a predictor of later behavior problems. In fact, examining peer characteristics such as antisocial or aggressive behavior in middle childhood may help to understand the process through which peer rejection is linked to subsequent behavior problems.

The primary contribution of this study is the systematic evaluation of hypotheses derived from multiple models of the development of behavior problems using a prospective, longitudinal design. Behavior problems in early childhood, peer rejection in middle childhood, and involvement with antisocial peers in early adolescence all were associated with externalizing problems in adolescence. These personal and peer relationship characteristics function as risk factors and likely represent potential pathways toward the development of antisocial and perhaps criminal behavior.

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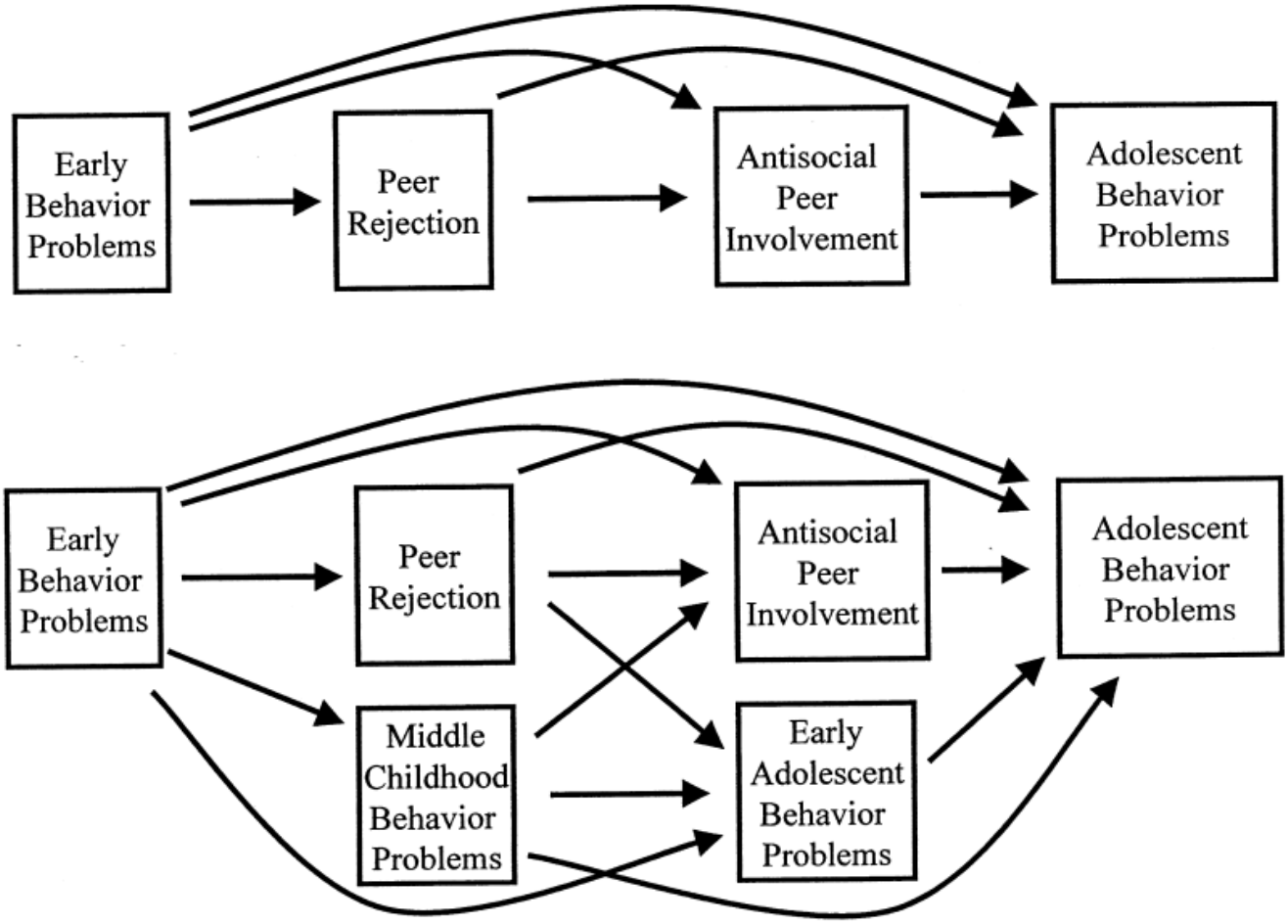


**Figure 1.**
Conceptual models.

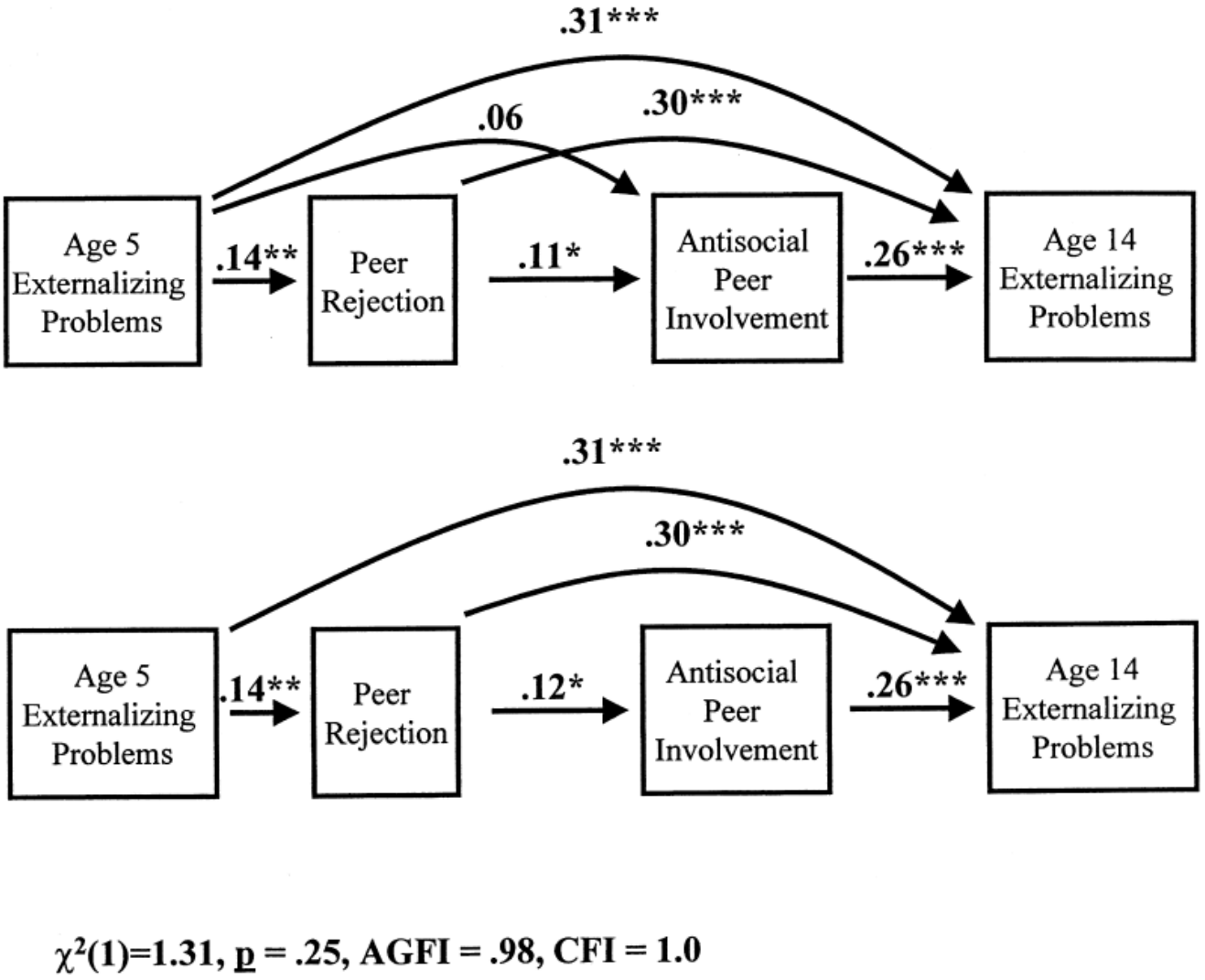


**Figure 2.**
Fitted basic model.

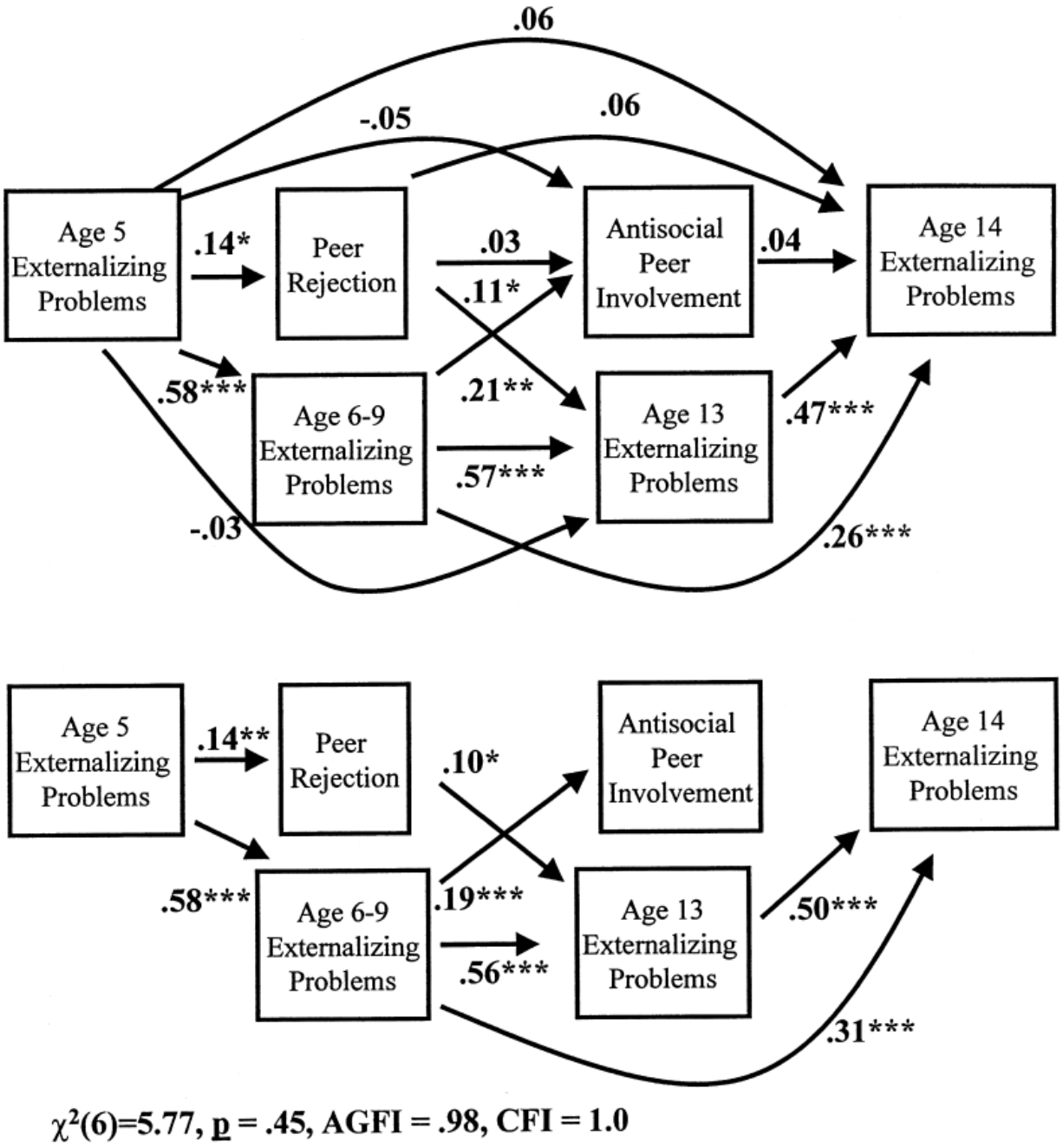


**Figure 3.**
Fitted complete model.

**Table 1**

**Means, standard deviations, and bivariate correlations**

| | | | Bivariate Correlations | | | | |
|---|---|---|---|---|---|---|---|
| **Variables** | ***M*** | **(*SD*)** | **1** | **2** | **3** | **4** | **5** |
| 1. Peer rejection | .10 | (.22) | | | | | |
| 2. Antisocial peers | 0.0 | (.92) | .12** | | | | |
| 3. Age 5 externalizing | 54.0 | (9.22) | .14** | .07 | | | |
| 4. Age 6–9 externalizing | 51.3 | (7.08) | .48*** | .19*** | .58*** | | |
| 5. Age 13 externalizing | 50.9 | (8.66) | .38*** | .46*** | .32*** | .61*** | |
| 6. Age 14 externalizing | 50.72 | (7.00) | .37*** | .32*** | .37*** | .61*** | .69*** |

** $p < .01$.

*** $p < .001$ (one-tailed).

## Table 2

**Percentage of membership in externalizing behavior trajectory groups experiencing peer relationship difficulties**

| | Never (*n* = 193) | Decreasing (*n* = 24) | Increasing (*n* = 29) | Always (*n* = 33) |
|---|---|---|---|---|
| Peer rejection | $10_{a}$ | $34_{b}$ | $29_{b}$ | $64_{c}$ |
| Antisocial peer involvement | $15_{a}$ | $24_{ab}$ | $54_{c}$ | $36_{bc}$ |
| Both peer rejection and antisocial peer involvement | $3_{a}$ | $7_{ab}$ | $17_{bc}$ | $27_{c}$ |

*Note:* Within each row, percentages with different subscripts differ significantly at $p < .05$ via chi-square tests with $df = 1$.