

Childhood Peer Rejection and Aggression as Predictors of Adolescent Girls' Externalizing and Health Risk Behaviors: A 6-Year Longitudinal Study

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This 6-year longitudinal study examined girls' peer-nominated social preference and aggression in childhood as predictors of self- and parent-reported externalizing symptoms, substance use (i.e., cigarette, alcohol, and marijuana use), and sexual risk behavior in adolescence. Participants were 148 girls from diverse ethnic backgrounds, who were initially assessed in Grades 4–6 and again in Grades 10–12. Results supported a moderator model, indicating that social preference changed the nature of the association between childhood aggression and adolescent outcomes. When accompanied by peer rejection, aggressive behavior was moderately stable over time and significantly associated with adolescent girls' substance use and sexual risk behavior. However, under conditions of peer acceptance, no significant association between childhood aggression and adolescent outcomes emerged.

Since the publication of Parker and Asher's (1987) seminal review of longitudinal findings on childhood peer relations and later clinical outcomes, investigators have sought to elucidate the role of peer acceptance and rejection in predicting adolescent externalizing behavior. This line of inquiry addresses a question that is fundamental to developmental psychopathology research, exploring the nature of interpersonal experiences as possible contributors to the development or exacerbation of severely disruptive and harmful behaviors. This work has direct implications for the development of selective and indicated preventive interventions, as difficulties with interpersonal experiences can appear as early as elementary school and may have effects on the presentation of externalizing and risk behaviors years later in adolescence (Tolan, Guerra, & Kendall, 1995b).

In an effort to understand the long-term clinical consequences of childhood peer acceptance and rejection, investigations over the past 15 years have attempted to reconcile findings revealing that (a) both peer rejection and aggressive behavior among peers are predictors of externalizing behavior and (b) aggressive behavior is a potent determinant of peer rejection. At face value, these results seem consistent with the notion that peer rejection may be simply an incidental correlate of an association between childhood aggressiveness and adolescent externalizing symptoms that might better be explained by the heterotypic continuity of aggression (i.e., an "incidental model"; Parker & Asher, 1987). The incidental model suggests that peer rejection is consequent to children's

aggressive behavior in childhood and offers little unique contribution to the development of adolescent disorder, including externalizing or risk behaviors.

Findings regarding the associations among childhood aggression, peer rejection, and adolescent disorder also may be suggestive of a "causal model" (Parker & Asher, 1987), in which peer rejection independently contributes to the development of externalizing behavior, beyond, or even accounting for the effects of early childhood predispositions to aggressive behavior. Several theories are available to explain this potential "causal" effect. For instance, social information processing theories suggest that rejected children may be prone to misattribute hostile intent to benign peer cues, leading to an exaggerated tendency to generate aggressive or impulsive strategies to interpersonal provocation dilemmas (Dodge et al., 2003). Thus, children rejected by peers may acquire cognitive vulnerabilities that are responsible for the onset of adolescents' externalizing and risk behaviors. Other theories suggest that childhood peer rejection leads to externalizing and risk behavior in adolescence through truancy, school drop out, and involvement with deviant peers (Coie, 1990; Dishion, Capaldi, Spracklen, & Li, 1995).

Still, a third possibility is that peer rejection *changes* the nature of the association between childhood aggression and adolescent externalizing behavior (i.e., a "moderator model"). Specifically, a moderating effect may suggest that peer rejection magnifies the association between childhood aggression and later externalizing or risk behavior and/or that peer acceptance mitigates the continuity of disruptive or harmful behaviors across development. These hypotheses also are consistent with contemporary theories. As a vulnerability factor, peer rejection may serve as an environmental stressor, triggering aggressive children's predispositions toward emotional dysregulation and providing increased opportunities for the reinforcement of aggressive children's maladaptive behavior (Coie, 1990; Dodge et al., 2003). Related theories have suggested that in contrast to nonrejected-aggressive children,

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rejected-aggressive youth exhibit more pervasive social deficits that hinder the development of adaptive interpersonal skills and increase children's risk for later externalizing and risk behaviors (Bierman & Wargo, 1995). In contrast, peer acceptance may serve as a protective factor for aggressive children by decelerating or halting trajectories toward maladaptive behaviors. Aggressive children who encounter positive peer experiences may have more opportunities than rejected-aggressive youth to receive corrective social feedback that assists in the development of appropriate emotion-regulation skills, provides opportunities to practice appropriate interpersonal behaviors, and remedies cognitive biases through repeated exposure to adaptive social interactions (Bierman & Wargo, 1995; Coie, 1990). Peer acceptance also provides increased access to high levels of friendship support that could prove beneficial for aggressive children's management of distress and regulation of negative emotional states (Bierman & Wargo, 1995; Coie, 1990).

Over the past 15 years, a modest number of longitudinal investigations have examined incidental and causal models of childhood peer rejection as a predictor of adolescent externalizing behavior (Bierman & Wargo, 1995; Coie, Lochman, Terry, & Hyman, 1992; Coie, Terry, Lenox, Lochman, & Hyman, 1995; French, Conrad, & Turner, 1995; Kupersmidt & Coie, 1990; Kupersmidt & Patterson, 1991; Lochman & Wayland, 1994; Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & the Conduct Problems Prevention Research Group, 2002; Miller-Johnson, Coie, Maumary-Gremaud, Lochman, & Terry, 1999; Woodward & Fergusson, 1999). Findings from these studies have been mixed. When considering the longitudinal main effects of childhood aggression and rejection simultaneously, some studies have found evidence for aggression as an exclusive predictor of adolescents' self-reported outcomes (Coie et al., 1992, 1995; Kupersmidt & Coie, 1990; Kupersmidt & Patterson, 1991) and for rejection as a unique, independent predictor of externalizing behaviors reported by others (Coie et al., 1992, 1995). Yet, these findings appear to vary greatly on the basis of demographic characteristics of the samples (e.g., age, ethnicity, gender) and of the parameters used to define adolescent externalizing behaviors (i.e., delinquency, aggression, illegal offenses, nonspecific outcomes).

Although rare, some longitudinal studies also have examined a moderator model either by statistically examining combinations of continuous aggression and rejection measures or by identifying categorical groups of rejected-aggressive children.

At least among boys, findings have revealed that the conjoint effects of rejection and aggression in childhood uniquely predict adolescents' illegal behavior, discipline problems, and externalizing behavior as rated by adolescents and parents (Bierman & Wargo, 1995; French et al., 1995; Lochman & Wayland, 1994; Miller-Johnson, Coie, et al., 1999). Using growth curve analyses, Coie and colleagues (1995) demonstrated that as compared with others, rejected-aggressive boys had the steepest increasing trajectories of self-reported externalizing problems beginning in the third grade and consistent levels of elevated parent-reported behavior problems beginning in the sixth grade for over 4 years. However, not all studies have yielded significant support for peer rejection as a moderating variable (Miller-Johnson et al., 2002; Woodward & Fergusson, 1999). Moreover, little attention has been dedicated toward understanding the potential buffering effects of

peer acceptance on the development of adolescent disruptive behavior.

A more striking omission in past work has been the lack of an examination of the combined or competing effects of rejection and aggression among girls—the focus of the present investigation. Indeed, because most prior investigations on rejected-aggressive youths have examined boys exclusively, there are few extant empirical data available to understand the developmental trajectories of aggressive behavior among girls who are or are not rejected by peers. Moreover, in the relatively few investigations that have included girls and examined gender differences, no empirical support has previously been provided for a moderator model in the prediction of adolescent girls' externalizing problems (e.g., Coie et al., 1995).

Given that the overall rate of adolescent girls' externalizing behavior is relatively low, the exclusive focus on adolescent boys in past research is not entirely surprising. However, in recent years, the rate of girls' externalizing behavior has increased dramatically. Between 1988 and 1997, the rate of adolescent girls' arrest for delinquent crimes increased by 83%, whereas boys' arrest rates increased by 39% (Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2000). Of these crimes, there has been a 155% increase in the number of person-directed crimes committed by girls, which is nearly twice that of boys, and a 54% increase in property offenses committed by girls, which is over five times the rate increase for boys (OJJDP, 2000). National youth risk surveillance data indicate that within a 1-year period, approximately one in four high school-aged girls become involved in a physical fight, and within a 1-month period, approximately 6% of girls carry a weapon to school (Centers for Disease Control [CDC], 2002).

In addition to increasing rates of externalizing behavior among girls, there is also substantial evidence revealing a high level of co-occurrence between adolescents' externalizing behavior and their health risk behavior, such as substance use or sexual risk behavior, particularly among girls (Fergusson, Horwood, & Lynskey, 1994; Keenan, Loeber, & Green, 1999). Fergusson and colleagues' (1994) examination of problem behavior profiles among adolescents indicates that although boys are more likely than girls to exhibit elevated levels of aggressive and criminal behavior, girls are up to three times more likely than boys to exhibit profiles of elevated substance use and early sexual activity. Interestingly, girls are equally as likely as boys to exhibit profiles of multiple problem behavior (i.e., including aggressive, criminal, and health risk behaviors; Fergusson et al., 1994). These findings argue not only for the study of health risk behaviors in addition to externalizing behaviors among girls specifically but also for the examination of girls' engagement in multiple behavioral outcomes across domains of externalizing and risk behaviors (i.e., profiles of externalizing behavior, substance use, and risky sexual behavior).

Indeed, current United States statistics indicate that the prevalence of girls' engagement in health risk behavior is growing at an alarming pace. Girls are now as likely as boys to engage in cigarette use, and like their male peers, the rate of adolescent girls' cigarette, marijuana, and cocaine use has nearly doubled in the past decade (CDC, 2002; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998). During this time, there has been a 132% increase in drug-related offenses committed by adolescent girls (OJJDP, 2000). It is currently estimated that within a 1-month period, approximately 28% of girls engage in cigarette use, 45% use

alcohol, 20% use marijuana, and 8% report that they have used cocaine in their lifetime (CDC, 2002). Over one third of adolescent girls indicate that they are sexually active, and over 11% of high school-aged girls report intercourse with four or more sexual partners. Yet, only 20% of sexually active girls report the use of birth control, and only 50% of their partners have used condoms (CDC, 2002).

As compared with the study of externalizing behavior, few longitudinal studies have examined conjoint effects of childhood rejection and aggression on the development of adolescents' health risk behavior, among girls or boys. Dishion and colleagues' studies on predictors of boys' substance use (Dishion et al., 1995; Dishion, Capaldi, & Yoerger, 1999) have revealed that boys rejected by peers at the age of 9 years are more likely to engage in nicotine, alcohol, and marijuana use during early adolescence; however, this association is ultimately accounted for by aggressive behavior in childhood (i.e., measured as child-, teacher-, and parent-reported antisocial behavior) and mediated by adolescent deviant peer group affiliation. French and colleagues (1995) revealed that rejected-antisocial 8th-grade students were more likely to use tobacco and alcohol 2 years later as compared with rejected-nonantisocial or peer-accepted students; however, Woodward and Fergusson's (1999) results did not support a moderator model for the prediction of substance use.

Only two longitudinal studies have examined childhood rejection and aggression as predictors of adolescent sexual behavior; these studies also have yielded mixed results. Underwood, Kupersmidt, and Coie (1996) independently examined childhood peer sociometric status and aggression as longitudinal predictors of teenage motherhood; however, the relative or combined contribution of these predictors was not explored. Results indicated that girls with childhood "controversial" peer sociometric status (i.e., indicating high levels of acceptance and rejection by peers) and aggressive girls were more likely to give birth in adolescence, had experienced more births than other adolescent mothers, and had given birth to their first child at earlier ages as compared with adolescent mothers. Also examining peer status and aggression separately, Miller-Johnson, Winn, et al.'s (1999) study on teenage motherhood replicated results only for childhood aggression; no significant effects were revealed for peer status. No prior study has directly examined predictive models of girls' sexual behavior considering childhood aggression and peer status conjointly.

This study therefore addressed several unanswered questions regarding the prediction of girls' externalizing and health risk behaviors (Keenan et al., 1999). Using a 6-year longitudinal dataset, childhood peer rejection and aggression were examined as predictors of several correlated outcomes for girls, including externalizing symptoms and health risk behaviors (i.e., cigarette, alcohol, marijuana, and "hard" drug use and risky sexual behaviors), as well as the prediction of a multiple outcome composite, reflecting girls' engagement in multiple externalizing and risk behaviors. Specifically, this study examined the incidental, causal, and moderator models by considering the relative and combined influences of rejection and aggression as predictors of these outcomes. Girls were the exclusive focus of the study, given their underrepresentation in prior longitudinal work and their increasing rates of externalizing and health risk behaviors.

Method

Participants

Participants were 148 girls who were in Grades 4–6 at the outset of the study and in Grades 10–12 (ages 15 to 18 years; $M = 16.82$; $SD = 0.86$) when the study was completed. The sample was 44.3% White/Caucasian ($n = 66$), 36.2% Hispanic American ($n = 54$), 14.8% African American ($n = 22$), and 4.7% Asian American–other ($n = 7$). Socioeconomic status for this sample was predominantly middle class, as categorized by Hollingshead's Social Class (Level I: 36.3%; Level II: 41.0%; Level III: 15.7%; Level IV: 4.7%; Level V: 2.3%; $M = 47.83$, $SD = 11.95$).

Procedure

A sample of 257 girls participated in this study at Time 1. Participants included over 85% of all 4th, 5th, and 6th graders from three elementary schools in a large urban metropolitan area. During this initial assessment, children completed questionnaires and peer nominations in their classrooms assisted by research assistants.

Six years later (Time 2), these students were tracked through the county public school database. By Time 2, 83 of the students (32%) were unable to be contacted (50 had withdrawn from the local school district; 33 did not have accurate contact information or were unable to be reached). Of the remaining 174 who were able to be contacted, 149 students (86%) agreed to participate (1 student with incomplete data was omitted from analyses). The final sample of 148 girls with complete data at both time points did not differ statistically from the 109 girls who did not participate at Time 2 on any measures of peer status, social-psychological functioning, or demographic variables.

At Time 2, adolescent girls and their parents completed questionnaires during individual home interviews conducted by trained research assistants. Written informed consent was obtained from adolescents and their parents prior to participation.

Measures

Peer acceptance and rejection (i.e., social preference). Consistent with the majority of past investigations examining the long-term consequences of peer acceptance and rejection (e.g., Boivin, Hymel, & Bukowski, 1995; Dodge et al., 2003; Lochman & Wayland, 1994; Miller-Johnson et al., 2002; Panak & Garber, 1992), the present study used a measure of social preference to assess girls' levels of peer acceptance and rejection. Specifically, at Time 1, girls completed classroom peer nominations, including three same-sex classmates they "liked most" and "liked least." Nominations were standardized by gender within each classroom. A standardized difference score between the standardized "liked most" and "liked least" nominations was computed as a measure of social preference. High social preference scores reflect high levels of peer acceptance, whereas low social preference scores reflect high levels of peer rejection (Coie & Dodge, 1983). Prior research indicates that peer nominations, and the resulting social preference scores, are valid indices of peer acceptance and rejection, with good test-retest reliability (Coie & Dodge, 1983). Thus, girls' social preference scores were used to index girls' acceptance and rejection in the subsequent data analyses.

Peer aggression. Peer nominations at Time 1 also were used to measure girls' aggressive and disruptive behavior. Girls nominated three same-sex classmates who "start fights," "interrupt," and are "bossy." A mean of standardized scores for these three items was computed as a measure of aggression and/or disruptive behavior; this index had adequate internal consistency ($\alpha = .68$). Results presented below were initially computed using only the starts fights item as a measure of aggressive behavior. This yielded an identical pattern of findings.

Externalizing behavior. At Time 2, the Youth Self Report (YSR; Achenbach & Edelbrock, 1987) and Child Behavior Checklist (CBCL;

Achenbach & Edelbrock, 1991) were administered to adolescents and parents, respectively, to examine externalizing behavior. Each instrument examines a range of behavior problem items (YSR = 102 items; CBCL = 118 items) that are rated as “not true,” “sometimes true,” or “often true.” A normalized *T* score was computed for the broadband Externalizing Composite Index on the CBCL and the YSR. The reliability, validity, and norms for each instrument have been well documented (Achenbach & Edelbrock, 1987, 1991).

Health risk behaviors. At Time 2, adolescents reported their health risk behaviors using the Survey of Risk Taking Behaviors (La Greca, Prinstein, & Fetter, 2001); this measure is a composite of items from prior instruments (Biglan et al., 1990; CDC, 2002; Jessor, Donovan, & Costa, 1991; Levine & Singer, 1988) including an assessment of substance use and risky sexual behaviors. For substance use, one item measured cigarette use (“On average, in the past month, how many cigarettes have you smoked each day?”); a mean was computed for two items assessing heavy episodic drinking (“How many times have you been drunk in the past 12 months?” “How often in the last 12 months did you drink five or more drinks on a particular occasion?”; $r = .71$), and one item measured marijuana use (“On the average, how many times per month do you use marijuana?”). Adolescents also listed the number of times in the past year that they used hard drugs (e.g., psychedelic drugs, cocaine, barbiturates, heroin, or other illegal drugs). Responses for all items were standardized within this sample. Jessor and colleagues (1991) have reported adequate validity for these items, including significant associations between each domain of substance use and deviant behavior. Using this measure, La Greca et al. (2001) found that adolescents’ affiliation with deviant peer crowds was linked with significantly higher levels of substance use.

Two aspects of sexual risk behavior were assessed: the number of girls’ different sexual partners (“the number of different people you had sexual intercourse with in the past year”) and their frequency of unprotected sex (“In the last year, how often have you used some kind of birth control when having sexual intercourse?” “In the last year, how often have you or your partner used something, such as a condom, to prevent venereal disease from spreading when having sexual intercourse?”; $r = .54$; both items were reverse coded). Items regarding unprotected sex were administered only to girls who reported that they were sexually active in the past year ($n = 55$; 37.2%). Responses for all items were converted to standardized scores within this sample. These two types of behaviors (number of different partners and unprotected sex) have been widely recognized as risky behaviors contributing to unwanted pregnancy and sexually transmitted diseases (Kirby, 2001; National Campaign to Prevent Teen Pregnancy, 2001). Prior research by Biglan and colleagues (1990) reported adequate reliability and validity for these items to assess adolescents’ sexual risk behavior.

Data Analysis

A primary goal of this study was to examine incidental, causal, and moderator models of adolescent girls’ externalizing and health risk behavior by considering the competing and combined influences of childhood aggression and peer acceptance and rejection (i.e., social preference). First, bivariate correlations were computed between the Time 1 and Time 2 variables to initially examine the incidental and causal models of prediction. Next, hierarchical linear regression models were computed for each outcome. In each model, adolescents’ age and ethnicity (i.e., using two dummy-coded variables corresponding to African American and Hispanic American ethnicity) were examined on the first step. Scores for childhood aggression and social preference were entered simultaneously on a second step. A significant effect for social preference at this step, after accounting for shared variability among the predictors, is most consistent with a causal predictive model, indicating that social preference is uniquely associated with adolescent girls’ outcomes. For outcomes in which a significant bivariate association was initially observed, the absence of a significant effect for social preference is most consistent with the incidental model,

indicating that the effects of childhood social preference (i.e., peer acceptance and rejection) may be accounted for by other predictors (i.e., aggression).

The moderator model was examined in a subsequent step entered into each hierarchical linear regression model. Specifically, a product term was computed between Social Preference \times Aggression. In the presence of a significant interaction effect, Holmbeck’s (2002) most recent guidelines for post hoc probing of significant moderational effects were used. These included (a) recomputation of a “reduced” regression model including only significant predictors to eliminate potential errors in parameter estimation or errors in partialling of unique effects due to multicollinearity (e.g., suppressor effects); (b) computation of slope estimates using centered variables (thus, further reducing multicollinearity); and (c) examination of the statistical significance of these slopes at high and low levels of peer status, the moderator variable (i.e., social preference). Using this procedure for significant moderator models, it was possible to estimate whether previously revealed significant associations were retained, or possibly magnified, under certain conditions of social preference (i.e., low social preference, indicating peer rejection) and/or mitigated at other levels of social preference (i.e., high social preference, indicating peer acceptance).

Results

Prevalence of Adolescent Girls’ Externalizing Symptoms and Health Risk Behavior

Descriptive analyses were initially conducted to explore the prevalence of externalizing symptoms and health risk behaviors in this sample of adolescent girls. Overall, results indicated that approximately 7.8% and 16.2% of the sample scored within the clinical range (*T* scores > 63 ; 90th percentile) on the CBCL ($M = 49.63$, $SD = 10.73$) and the YSR ($M = 55.41$, $SD = 8.96$), respectively. Adolescents’ reports of substance use indicated that within the past year, 20.1% of girls smoked cigarettes, 32.2% engaged in heavy episodic drinking, 23.5% used marijuana, and 16.8% used hard drugs. Approximately 37.2% of the sample had sexual intercourse in the past year, 10.9% reported that they had never used birth control, and 14.5% reported that they had never used protection against sexually transmitted infections (STIs). Adolescents’ age was positively correlated with the number of girls’ sexual partners ($r = .27$, $p < .01$); no other significant effects for age were revealed.

Intercorrelations Among Primary Variables at Time 1 and Time 2

Before examining the combined and competing longitudinal effects of childhood aggression and social preference on girls’ externalizing problems and health risk behaviors during adolescence, Pearson’s correlations were computed to examine intercorrelations among all Time 1 and Time 2 variables. These results are presented in Table 1.

Correlations among Time 1 variables revealed a pattern of findings consistent with past research. Specifically, concurrent associations were revealed between low levels of girls’ social preference (i.e., peer rejection) and high levels of aggression in childhood. Concurrent associations at Time 2 indicated that girls’ externalizing behavior was significantly associated with several indices of substance use and sexual risk behaviors. Correlations between Time 1 and Time 2 variables revealed longitudinal associations at a bivariate level. Results indicated that low levels of

Table 1
Intercorrelations Among Variables at Time 1 and Time 2 ($N = 148$)

Variable	1	2	3	4	5	6	7	8	9	10
Time 1										
1. Social preference	—	-.44***	-.07	-.08	-.08	-.01	-.23**	-.12	-.15	.04
2. Aggression		—	.22**	.23**	.21**	.20**	.25**	.09	.33***	.11
Time 2										
3. CBCL-Externalizing			—	.27***	.20**	.02	.14	.03	.24**	.09
4. YSR-Externalizing				—	.28***	.27***	.36***	.30***	.17*	.27***
5. Cigarette use					—	.33***	.50***	.33***	.22**	.19*
6. Heavy episodic drinking						—	.52***	.47***	.24**	.18*
7. Marijuana use							—	.69***	.28***	.36***
8. Hard drug use								—	.23**	.24**
9. No. of sexual partners									—	.02
10. Unprotected sex ^a										—

Note. CBCL = Child Behavior Checklist; YSR = Youth Self-Report.

^a $n = 55$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

social preference (i.e., peer rejection) and high levels of aggression were associated with high levels of adolescent girls' self-reported marijuana use. Greater levels of aggression were additionally associated with higher levels of self-reported cigarette use and parent- and adolescent-reported externalizing symptoms as well as with girls' self-reported cigarette use, heavy episodic drinking, and greater number of sexual partners.

On the basis of these results, there is good evidence to suggest that girls' childhood aggression is associated with a range of adolescent outcomes. However, with the exception of marijuana use, no evidence emerged to support either the causal or the incidental models of girls' childhood social preference (i.e., peer rejection) as a longitudinal predictor. The incidental and causal models require an initially significant association between social preference at Time 1 and adolescent outcomes at Time 2. Subsequent hierarchical multiple regression analyses examined social preference as a potential *moderator* of the association between childhood aggression and girls' adolescent outcomes.

Predictive Models of Adolescent Girls' Outcomes

Externalizing behavior. Two hierarchical multiple regression models were computed to examine adolescents' parent- and self-reported externalizing behavior, respectively (see Table 2). The results revealed a significant effect for childhood aggression as a predictor of adolescent girls' externalizing behavior, as reported by parents and the girls themselves. For the parent reports, this effect was qualified by a significant interaction in Step 3, indicating that social preference significantly moderated the association between childhood aggression and girls' externalizing behavior in adolescence. Examination of slopes indicated that under conditions of low social preference (i.e., peer rejection), childhood aggression was significantly and positively associated with externalizing behavior in adolescence ($B = 3.60$, $p < .05$). However, under conditions of high social preference (i.e., peer acceptance), there was no significant association between childhood aggression and girls' parent-reported externalizing behavior (i.e., slopes were not

Table 2
Hierarchical Linear Regression Models of Childhood Aggression and Social Preference as Predictors of Adolescent Girls' Externalizing Behavior

Time 1 predictor	Externalizing behavior					
	Parent-reported (CBCL)			Adolescent-reported (YSR)		
	ΔR^2	β at step	Final β	ΔR^2	β at step	Final β
Step 1 (R^2)	.02			.02		
Age		.08	.08		-.11	-.12
Ethnicity (African American)		.09	.09		-.10	-.10
Ethnicity (Hispanic American)		-.07	-.04		.06	.09
Step 2 (ΔR^2)	.04*			.06*		
Aggression		.21*	.13		.25*	.20
Social preference		.03	.09		.01	.04
Step 3 (ΔR^2)	.03*			.01		
Aggression \times Social Preference			-.20*		-.12	
Total R^2	.09*			.09*		
Total $F(6, 141)$	2.77*			2.41*		

Note. CBCL = Child Behavior Checklist; YSR = Youth Self-Report.

* $p < .05$

significantly different from zero; $B = 0.47, ns$). In other words, the results indicated that high levels of social preference buffered the effects of childhood aggression on girls' later externalizing symptoms.

Substance use. Four models were computed to examine adolescents' cigarette use, heavy episodic drinking, marijuana use, and hard drug use, respectively (see Table 3).¹ A significant model was revealed for all four substance-use outcomes, and a significant moderator effect was observed for three of the four outcomes. For cigarette use, significant associations were revealed only for childhood aggression when considering the competing effects of all predictors (i.e., Step 2; see Table 3); no support for the moderator model was revealed. However, significant support for the moderator model was revealed for the prediction of heavy episodic drinking, marijuana use, and hard drug use. In each case, a significant interaction term indicated that social preference moderated the effects of childhood aggression on girls' substance use in adolescence. Supplemental analysis of slopes revealed a similar pattern of findings for heavy episodic drinking and marijuana use. Specifically, under conditions of low social preference (i.e., peer rejection), childhood aggression was significantly associated with each measure of girls' substance use (heavy episodic drinking: $B = 0.31, p < .05$; marijuana use: $B = 0.32, p < .05$); however, under conditions of high social preference (i.e., peer acceptance), aggression was not significantly associated with substance use (heavy episodic drinking: $B = -0.10, ns$; marijuana use: $B = -0.07, ns$). Supplemental analysis of the moderator model for the prediction of hard drug use revealed no significant slopes (low social preference: $B = 0.37, ns$; high social preference: $B = -1.88, ns$). In addition to these findings, African American girls were found to report lower levels of heavy episodic drinking and marijuana use than other girls.

Sexual behavior. A significant model was revealed for the prediction of the number of girls' sexual partners (see Table 3). Higher levels of childhood aggression were associated with greater numbers of girls' sexual partners; girls' social preference was not a significant predictor after controlling for shared variability among the predictors. No support for the moderator model was revealed.

Prediction of a Multiple Outcome Composite

A final analysis examined predictive models of a multiple-problem composite score that reflected a profile of elevated levels of problem behavior across domains of externalizing and health risk behaviors. This composite score was computed by assigning a value of 1 for each outcome variable in which girls scored at or above the clinical cutoff score or above the 85th percentile for each risk behavior (i.e., over one standard deviation above the mean). Specifically, cutoff scores corresponded to a T score above 63 on either the CBCL or YSR, smoking a minimum of 2–5 cigarettes a day, heavy episodic drinking at least 10 times in the past year, using marijuana at least 2–3 times per month, using hard drugs at least 4 times in the past year, engaging in sexual intercourse with two or more partners in the past year, and among those who engaged in intercourse, having never used either birth control or STI protection. The composite score was computed as a sum across the seven indices, with total scores ranging from 0 to 7. The majority of girls (58%) did not exceed the cutoff for any of these

behaviors (total multiple outcome composite score, $M = 0.87, SD = 1.40$). Zero-order correlations computed between this composite score and each predictor indicated that multiple adolescent outcomes were significantly related to aggression ($r = .37, p < .0001$) and lower levels of social preference (i.e., peer rejection; $r = -.20, p < .05$) in childhood.

The multiple outcome composite score was used as a dependent variable in a final hierarchical multiple regression analysis to examine predictive models, as previously described (see Table 4). Findings indicated significant support for a main effect of childhood aggression after controlling for other predictors (i.e., Step 2). This effect was qualified by significant support for the moderator model (i.e., Step 3), indicating that the association between aggression and multiple adolescent outcomes varied at different levels of social preference. Supplemental analysis of slopes indicated that under conditions of low social preference (i.e., peer rejection), aggression was significantly and strongly associated with multiple adolescent outcomes ($B = 0.77, p < .0001$); however, under conditions of high social preference (i.e., peer acceptance), aggression was not significantly associated with the multiple outcome composite score ($B = 0.19, ns$).

Discussion

Past research on boys' externalizing behavior has demonstrated that aggressive behavior is fairly stable between childhood and adolescence (e.g., Huesmann, Eron, Lefkowitz, & Walder, 1984) and that the risk for adolescent externalizing problems is compounded by the combination of aggressive behavior and peer rejection in childhood (Bierman & Wargo, 1995; Coie et al., 1995). However, among girls, little is known about the stability of aggressive behavior or about the combined effects of aggression and peer rejection (Kennan et al., 1999; Silverthorn & Frick, 1999).

Consistent with the early-starter and life-course persistent models of externalizing behavior among boys (Moffitt, 1993; Patterson, Capaldi, & Bank, 1991), findings from the present study revealed significant stability between girls' aggressive and disruptive behavior in childhood and levels of externalizing symptoms 6 years later in adolescence. Moreover, by examining a broader range of outcomes than in prior work, significant associations were revealed between childhood aggression and a variety of related adolescent risk behaviors, including cigarette use, heavy episodic drinking, marijuana use, and the number of girls' sexual partners. Overall, the findings suggested that like boys, the development of girls' externalizing and risk behaviors was predicted by early engagement in aggressive behavior with peers. Such findings highlight the need for early preventive interventions that target girls' aggressive behaviors in childhood, as early aggression is

¹ To address potential concerns regarding skewness in outcome variables, we conducted a log transformation for three measures that displayed significant skew: girls' cigarette, marijuana, and hard drug use. Analyses using transformed variables revealed identical results. Specifically, for girls' cigarette use, only childhood aggression was a significant predictor ($\Delta R^2 = .06, p < .05$). For models predicting girls' marijuana and hard drug use, significant effects were revealed for the moderator term ($\Delta R^2 = .05$ and $.05, \beta = -.28$ and $-.24$, respectively, $ps < .05$). These findings are virtually identical to results now presented in Table 3.

Table 3
Hierarchical Linear Regression Models of Childhood Aggression and Social Preference Predicting Adolescent Girls' Health Risk Behaviors

Time 1 predictor	Cigarette use			Heavy episodic drinking			Marijuana use			Hard drug use			No. of sexual partners		
	ΔR^2	β at step	Final β	ΔR^2	β at step	Final β	ΔR^2	β at step	Final β	ΔR^2	β at step	Final β	ΔR^2	β at step	Final β
Step 1 (R^2)	.04	.09	.07	.11	.02	.01	.04	.05	.03	.03	-.09	-.09	.09	.26**	.23**
Age		-.16	-.17		-.34**	-.33**		-.17	-.17*		-.15	-.15		-.12	-.14
Ethnicity (African American)		.03	.05		-.18*	-.15		.01	.06		.05	.08		-.04	-.02
Ethnicity (Hispanic American)				.04*			.09**			.03			.11		
Step 2 (ΔR^2)	.06*	.24*	.21*	.02*	.23*	.15	.05**	.21*	.10	.04*	.08	-.02	.04*	.33**	.32**
Aggression		<.01	.02		.08	.13		-.15	-.08		-.12	-.05		<.01	.01
Social preference			-.08			-.19*			-.27**			-.24*			-.04
Step 3 (ΔR^2)	<.01			.18*			.18***			.10*			.20***		
Aggression \times Social Preference				5.00*			5.05***			2.52*			5.84***		
Total R^2	.10*														
Total $F(6, 141)$	2.68*														

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Hierarchical Linear Regression Models of Childhood Aggression and Social Preference as Predictors of a Multiple Adolescent Outcome Composite Score

Time 1 predictor	ΔR^2	β at step	Final β
Step 1	.05		
Age		.04	.02
Ethnicity (African American)		-.21*	-.22*
Ethnicity (Hispanic American)		-.03	.02
Step 2	.14**		
Aggression		.36***	.26**
Social preference		-.02	.04
Step 3	.05**		
Aggression \times Social Preference			-.26**
Total R^2	.23***		
Total $F(6, 141)$	7.03***		

* $p < .05$. ** $p < .01$. *** $p < .001$.

associated with a wide range of adolescent problem behaviors, as well as with later aggression.

The findings regarding the associations between girls' aggressive behavior in childhood and later externalizing symptoms are particularly interesting in light of recent work on girls' relational aggression (e.g., Crick, 1996). The present study examined peer-rated aggression and disruptive behavior in childhood without specific reference to relational forms of aggression. Unlike overt forms of aggressive behavior (e.g., physical fighting, verbal teasing), relational forms include the use of relationships as an instrument of harm (e.g., by withdrawing friendship support or by excluding peers from activities; Crick, 1996). Although it appears that relational forms of aggression may be as prevalent or perhaps more common among girls as compared with boys, research has not yet demonstrated whether or how these particular behaviors may lead to the development of severe externalizing or risk behaviors, such as substance use or unsafe sexual practices. Indeed, given the salience of relational forms of aggression for girls, it will be important for future work to demonstrate the clinically relevant consequences of relational aggression. Interestingly, previous findings in this area have indicated that girls' engagement in overtly aggressive behaviors (i.e., "gender nonnormative aggression") is associated with concurrent indices of maladjustment (Crick, 1997). The results from the present study are consistent with these findings on gender nonnormative behavior and extend this work by demonstrating that girls' overt aggression is an important longitudinal predictor of adolescent problem behaviors, especially among those girls with low social preference.

Perhaps the most significant findings from this study pertained to the role of social preference (i.e., peer acceptance and rejection) in predicting adolescent girls' problem behaviors. Prior longitudinal studies have primarily explored causal and incidental models to capture the potential unique effects of early peer rejection on later adjustment, after accounting for aggression. In this study, no support was obtained for the causal or incidental models. However, findings were consistent with a moderator model, indicating that girls' social preference changed the nature of the association between early aggression and later externalizing and health risk behaviors. Specifically, the findings suggested that social preference serves as both a vulnerability and protective mechanism among aggressive girls (Rutter, 1990).

Regarding the vulnerability mechanism of low social preference (i.e., peer rejection), prior theoretical and empirical work has been offered to suggest that peer rejection may increase the risk for later adjustment difficulties among aggressive boys; however, this finding has not previously been observed for girls. Existing theories suggest that peer rejection contributes to the development of global social dysfunction, cognitive biases, and inappropriate emotional expression and regulation, leading to an increased risk of serious externalizing and antisocial behaviors among aggressive boys (Bierman & Wargo, 1995). Results from this study revealed that low social preference not only heightened the association between girls' peer aggression in elementary school and their later externalizing behaviors but also increased their risk for substance use (i.e., heavy episodic drinking, marijuana use), sexual risk behavior (i.e., intercourse with multiple sexual partners), and profiles of elevated problem behaviors across domains (i.e., multiple outcome composite). These results offer important information to guide future work examining the interpersonal processes and mechanisms that lead to the development of externalizing and risk behavior among girls. Such research is especially important in view of the increasing seriousness of externalizing and substance use behaviors during adolescence (Coie & Dodge, 1998).

In addition to the vulnerability function of peer rejection, the findings of this study also offered some support for a protective function of childhood peer acceptance (i.e., high social preference) in the development of aggressive and risk behavior. As a protective mechanism, peer acceptance may reduce or even eliminate the risk of childhood aggression on later outcomes (Stouthamer-Loeber, Loeber, Wei, Farrington, & Wikström, 2002). Indeed, the present results revealed that there was no significant association between aggression and later outcomes under conditions of high social preference; stability coefficients approached zero. In other words, the effects of childhood aggression on maladaptive adolescent behavior were virtually nullified under conditions of high acceptance by peers. This finding was revealed for the prediction of parent-reported externalizing symptoms, heavy episodic drinking, marijuana use, and the multiple problem composite score, indicating profiles of elevated problem behaviors across domains examined (i.e., externalizing, substance use, and sexual risk behaviors).

This result might be interpreted in several ways. As suggested earlier, high social preference (i.e., peer acceptance) may offer aggressive children compensatory benefits, such as opportunities to develop appropriate emotion regulation skills, to practice appropriate interpersonal behaviors, or to receive friendship support from peers that is more commonly afforded to accepted rather than to rejected children (Coie, 1990). Future research should continue this line of exploration by examining mechanisms that may help to explain the potentially protective effects of peer acceptance among aggressive girls.

Alternatively, it may be that peer-accepted girls exhibit particular manifestations of peer aggression in childhood that are not directly linked to emotional maladjustment or later externalizing behavior. For instance, nonrejected-aggressive children are more likely to aggress proactively rather than reactively compared with rejected-aggressive youth (Dodge & Coie, 1987; Price & Dodge, 1989). Although reactive aggression (i.e., aggressive behavior in response to internally or externally derived frustration) is associated with a range of social-cognitive deficits (e.g., hostile attribution biases) and difficulties in adaptive emotional expression,

evidence suggests that proactive aggression (i.e., strategic, controlled use of aggression) may lead to dominance, increased access to social resources, and high status among peers (Bandura, 1973; Dodge & Coie, 1987; Hartup, 1974; Hawley, 1999; Prinstein & Cillessen, 2003). This study did not examine proactive and reactive functions of childhood aggressive behavior; however, the results are consistent with the notion of two distinct developmental trajectories for girls who exhibit aggressive behavior in childhood (Tolan, Guerra, & Kendall, 1995a). More work is needed to explore whether these two divergent longitudinal pathways of aggression may be explained by different aggressive functions in addition to the apparent effects of social preference on later clinical outcomes.

Still, a third possibility suggests that social preference may have been merely an incidental marker for skills or competencies that were ameliorative in reducing the risk for adolescent disorder. For example, it may be that aggressive girls with high levels of social preference were better able to maintain positive relationships with adults and peers or excelled in other domains of functioning (e.g., athletic, scholastic) despite their tendencies toward aggressive and disruptive behavior. It also may be that these girls' aggressive behavior was lower in intensity or more skillful in execution than rejected-aggressive girls' aggression. Thus, acceptance by peers may have been an instrumental factor in the reduction of risk from adolescent disorder or a variable indicating differences in the function, presentation, or intensity of girls' aggression in childhood.

Future research in this area would benefit from continued examination of causal, incidental, and particularly moderator models of girls' peer status and aggression as predictors of adolescent externalizing and health risk behavior. The use of larger samples and measures of aggressive functions as well as the study of girls' relational aggression in childhood would be especially important for further understanding the clinical outcomes of aggressive girls. In addition, the collection of data at multiple time points between childhood and adolescence may help to reveal distinct trajectories of aggressive and/or rejected youth (see Haselager, Cillessen, Van Lieshout, Riksen-Walraven, & Hartup, 2002) as well as help to reduce attrition rates in long-term longitudinal studies. Finally, future research might examine issues of culture and ethnicity in greater detail. Although not a focus of this study, it was observed that African American girls reported lower levels of alcohol and marijuana use than other adolescent girls. This suggests that ethnic and cultural differences may play an important role in adolescent girls' health risk behaviors and warrant further attention.

Overall, the results generally supported the multifinality of childhood aggression, particularly in combination with peer rejection, as a predictor of girls' externalizing and risk behaviors in adolescence. Notably, the adolescent outcomes examined in this study also can have enduring deleterious effects on later adjustment in adulthood and increased risk for adult mortality. Adolescents' use of alcohol and marijuana has been linked with increased rates of substance abuse in adulthood (Chassin, Pitts, & Prost, 2002; Windle, 1990). Early initiation of sexual behavior among adolescent girls correlates with greater sexual promiscuity and less frequent use of STI protection in adulthood (e.g., Greenberg, Magder, & Aral, 1992). Early adolescent sexual activity is also a significant predictor of the number of STIs during adulthood (Greenberg et al., 1992) and has been linked with higher rates of

cervical cancer later in life (Edebiri, 1990). Thus, prevention strategies targeted toward aggressive and rejected girls may potentially yield long-term benefits by altering developmental trajectories well beyond adolescence.

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