Classroom Social Experiences as Predictors of Academic Performance

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A model linking children's peer acceptance in the classroom to academic performance via academic self-concept and internalizing symptoms was tested in a longitudinal study. A sample of 248 children was followed from 4th to 6th grade, with data collected from different informants in each year of the study to reduce respondent bias. A path analysis supported the model; a lack of peer acceptance in the classroom in 4th grade predicted lower academic self-concept and more internalizing symptoms the following year, which in turn, predicted lower academic performance in 6th grade. An alternative path with internalizing symptoms predicting declines in peer acceptance was tested and received some support as well. Implications of the findings for schools are discussed.

School is an important context for children's academic and social development. Everyone accepts that the three Rs—reading, writing, and arithmetic—are fundamental to school success. Teachers regularly provide instruction in these basic subjects to promote children's academic success. But what about a fourth R—relationships? Are children's relationships with peers also important for their academic achievement? If so, what connects social experiences to learning and performance in school? These questions were addressed in the longitudinal study described here. In particular, we tested the hypothesis that social acceptance in the classroom is indirectly associated with future academic achievement through its impact on an elementary-school-age child's self-concept and psychological well-being.

Previous research has tied the quality of children's social relationships to their academic achievement (Guay, Boivin, & Hodges, 1999; Noack, 1998; Pettit, Clawson, Dodge, & Bates, 1996). The quality of peer relations has been associated both with students' academic orientations and with their school performance (Gonzales, Cauce, Friedman, & Mason, 1996; Wentzel & Watkins, 2002). Problematic peer relationships, in particular, have consistently been linked with poor academic outcomes (DeRosier, Kupersmidt, & Patterson, 1994; O'Neil, Welsh, Parke, Wang, & Strand, 1997; Welsh, Parke, Widaman, & O'Neil, 2001). Despite the demonstra-

tion of significant associations, three characteristics of past research limit the conclusions that can be drawn about the impact of classroom social experiences on academic achievement. First, most studies have had the same informant report on key variables, which can result in correlations that are artificially inflated by respondent biases. Second, in almost all cases, the findings have been based on cross-sectional data, which cannot address questions of causal priority. Third, with few exceptions, past research has neglected to address questions about *how* children's social and academic experiences at school are connected.

This study tested a process model, shown in Figure 1, that connects social acceptance in the classroom to academic performance. Shortcomings in the research literature were addressed by the use of longitudinal data collected over 3 years, from fourth to sixth grade, with information provided by different teachers each year. As shown in Figure 1, we propose that social acceptance in the classroom and academic performance are indirectly linked through the impact that social experiences have on a child's self-concept and psychological well-being. The rationale behind each of these mediators is discussed next.

Connecting Classroom Social Experiences to Academic Performance

Behaviors such as classroom participation and prosocial behavior have been examined as mediators of the association between classroom social experiences and learning and performance (Buhs & Ladd, 2001; Wentzel & Caldwell, 1997). Our model focuses instead on aspects of children's psychological development that may have important implications for their school functioning: representations of the self—in particular, the academic self-concept—and psychological well-being—in particular, internalizing symptoms.

Academic Self-Concept

Middle childhood is a critical period for self-concept formation (Byrne & Shavelson, 1996; Harter, 1990). While at school, children are developing a sense of themselves both as students and as social beings, and the beliefs that they form about their academic

Figure 1. Conceptual model of mediation.

abilities affect their classroom performance. In fact, academic self-concept has been identified as a predictor of academic achievement beyond what can be explained by prior achievement (Marsh & Hau, 2003). Children who are secure and confident in their ability to succeed are likely to put forth the effort required to master schoolwork (Dweck, 1986). When the material is challenging, they work even harder and, as a result, earn high grades, which reinforces their belief in their abilities. However, children who are uncertain about their abilities, regardless of objective indicators of their academic performance, might be inclined to give up easily or not put forth as much effort (Repetti, McGrath, & Ishikawa, 1999). Negative perceptions of academic ability could contribute to a cycle that causes a child to fall behind in schoolwork.

It is reasonable to hypothesize that social experiences in the classroom play a role in shaping a child's academic self-concept. We know that school-age children's views about themselves are formed in part from their relationships (Cole, Maxwell, & Martin, 1997; Harter, 1988; Wentzel, 1998). Children who are isolated from their peers may come to think about themselves in negative terms, and their negative self-evaluations may extend beyond the social domain to include internalized negative beliefs about their core self-worth (Graham & Juvonen, 1998). The negative feedback they receive from peers may color their view of their abilities, such as when another child calls them names that demean their ability (e.g., stupid or dumb). Children who lack acceptance from peers may also be excluded from group activities and harbor negative attitudes about school. Consequently, such children may lack motivation and confidence and disengage from classroom activities. Thus, socially maladjusted children may form a poor academic self-concept that adversely affects their performance in the classroom. The model in Figure 1 proposes that a weakened academic self-concept contributes to the indirect association between a lack of social acceptance at school and subsequent declines in academic performance.

Internalizing Symptoms

Diminished psychological well-being may also contribute to the indirect association between social experiences and academic per-

formance in the classroom. In particular, Figure 1 focuses on a constellation of problems often grouped under the general heading of internalizing symptoms, which include signs of behavioral inhibition and negative emotions such as anxiety and sadness. Children who are rejected and lack acceptance from peers are prone to feelings of loneliness and depressed mood (Brendgen, Vitaro, Turgeon, & Poulin, 2002; Kochenderfer & Ladd, 1996; Panak & Garber, 1992; Sletta, Valas, Skaalvik, & Sobstad, 1996). Free from psychological distress, a child can maintain focus and concentrate on school-related tasks and challenges. Reduced vulnerability to depression in children contributes to their scholastic achievement (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Dweck, 1986).

However, the attentional resources of a child suffering psychological distress may be shifted to other problems, leaving the child less able to attend to lessons in class. Negative mood states have, in fact, been found to interfere with students' learning at school (Roeser, van der Wolf, & Strobel, 2001). The role of internalizing symptoms depicted in our model was supported by another study's analysis of cross-sectional data in which perceived peer harassment correlated with low self-worth, feelings of loneliness, and depressive symptoms. These indicators of psychological distress, in turn, predicted poorer school outcomes among middle-school students (Juvonen, Nishina, & Graham, 2000).

The model proposed in this study implies directionality in that lack of peer acceptance precedes internalizing symptoms. Previous research has not been conclusive as to the direction of these paths (Hodges & Perry, 1999; Hymel, Rubin, Rowden, & LeMare, 1990; Strauss, Forehand, Smith, & Frame, 1986). Therefore, the reverse path, with internalizing symptoms predicting lack of peer acceptance, was also tested in a multiple regression analysis.

To summarize, the conceptual model in Figure 1 specifies that declines in academic self-concept and increases in internalizing symptoms contribute to an indirect association between a lack of peer acceptance in the classroom and poor academic performance. Predictor, mediator, and outcome variables in the model were measured in 3 consecutive years, from the fourth grade to the sixth

grade, with data collected from different teachers each year and self-report used in one year.

Method

Procedure

The data for this study were collected as part of a 3-year longitudinal investigation of child and family development. Parents of fourth-grade children from three schools, one parochial school and two public schools, in a large metropolitan area were sent letters describing the study. Children who agreed to participate, and whose parents signed consent forms, completed annual interviews, and their fourth-, fifth-, and sixth-grade teachers responded to questionnaires. In exchange for their participation each year, children and teachers received a small honorarium.

Participants

Cohorts of fourth-grade children were recruited into the study in each of 3 consecutive years. A total of 677 fourth-grade children were invited to participate, and parental consent was obtained from 248 (37%) of the families. The study maintained a high retention rate over 3 years, with academic performance indicators for 82% of children obtained from report card grades assigned by sixth-grade teachers. Fourth-grade teachers completed reports of children's peer acceptance for 99% of children. Fifth-grade teachers reported on internalizing symptoms for 83% of children. Interviews for 93% of children were completed in the fifth grade. The sample consisted primarily of high-income, highly educated Caucasian families. Approximately 81% of parents identified themselves as Caucasian (8% identified themselves as Asian/Pacific Islander, 4% as Latino, 1% as African American, 1% as Native American, and 5% as Other). More than half of the families (54%) reported earning more than $80,000 per year from 1992 to 1997, and over 80% of the parents were college graduates.

Measures

The predictor, mediator, and outcome variables were examined using different teachers' reports of children's behavior, children's perceptions about themselves, and report card grades.

Predictor Variable: Lack of Peer Acceptance

Children's peer acceptance in the classroom in fourth grade was assessed with a teacher-report measure developed for use in this study. Using a 5-point Likert-type response scale, teachers rated children on eight items that assessed (a) how well liked the child was, (b) the extent to which he or she was disliked, (c) number of good friends, (d) popularity among peers, (e) exclusion from play and activities organized by other children, and (f) the extent to which the child would or would not be chosen by peers to participate in different group activities (i.e., social, athletic, academic). The scale has high internal consistency (Cronbach's $\alpha = .94$), and previously reported results indicate that it correlates with other validated measures of peer acceptance based on teacher reports, parent reports, and child self-reports (McGrath & Repetti, 2002). The mean of teachers' responses to the eight items was computed, with higher scores indicating less peer acceptance at school.

Mediator Variables

Academic self-concept. The six-item Academic Competence subscale of the Self-Perception Profile for Children (SPPC) was used to measure children's perceptions of their academic abilities in the fourth and fifth grades (Harter, 1985). For each question, children decided which of two statements best described them (e.g., "Some kids have trouble figuring out the answers in school, BUT, Other kids almost always can figure out the answers") and then indicated whether the statement was "really true for me" or "sort of true for me." Each item was scored from 1 to 4, and the mean of the six items was calculated. Higher scores reflect children's more positive evaluations of their own academic abilities. This scale had good internal consistency (Cronbach's $\alpha = .82$).

Internalizing symptoms. Teachers' reports on the Internalizing Syndrome scale of the Teacher Report Form (TRF) served as an indicator of children's psychological well-being in the fourth and fifth grades. The TRF has been shown to be reliable, stable, and valid (Achenbach, 1991; Edelbrock & Achenbach, 1984; Edelbrock, Greenbaum, & Conover, 1985). The Internalizing Syndrome scale on the TRF comprises 26 items that describe somatic complaints and withdrawn and anxious/depressed behaviors. Sample items include "feels worthless or inferior" and "too fearful or anxious." Items are rated according to whether they are *not true* (0), *sometimes true* (1), or *often true* (2) of the child during the previous 6 months. The scale had good internal consistency in the current study (Cronbach's $\alpha = .86$).

Outcome Variable: Academic Performance

Children's academic performance in the fourth, fifth, and sixth grades was assessed by their achievement in two subjects, reading and math, as recorded on their report cards. Reading and math grades were assigned by different teachers during the semester in which children completed their interviews. Because different schools involved in this study assigned grades in different ways, before testing hypotheses, we standardized reading and math grades within each school and cohort to a mean of 0 and a standard deviation of 1. We then computed the average of the reading and math grades at each time period in order to form an overall measure of academic performance for each child during that grading period.

Results

Analysis Overview and Assumptions

Although children changed classrooms in each year of the study and different teachers reported on students at each time point, children were nested within classrooms. To correct for this clustering, we controlled for potential classroom effects and obtained fixed-effect estimates for all of our analyses. Intraclass correlations were obtained from a set of regression equations in which dummy codes for fourth- and fifth-grade classroom assignments were entered as predictors of each of the four variables in the path model (Cohen, Cohen, West, & Aiken, 2003). The resulting estimates of classroom nesting effects were as follows: lack of peer acceptance in fourth grade, $R^2 = .25$; academic self-concept in fifth grade, $R^2 = .21$; internalizing symptoms in fifth grade, $R^2 = .42$; and academic performance in sixth grade, $R^2 = .21$.

The study hypotheses were first tested through correlations with cross-sectional data while controlling for classroom nesting. Each path in the conceptual model was then tested with longitudinal data in hierarchical regression analyses that controlled for earlier levels of the outcome variable as well as classroom assignment. Tests of gender differences and of the reverse path predicting lack of peer acceptance from internalizing symptoms were also performed.

The final test of the overall model involved a longitudinal path analysis (with fourth- and fifth-grade classroom nesting variance removed) in which the predictor, mediator, and outcome variables were each measured at different, sequential time points. Different

teachers provided reports each year of the study: Fourth-grade teachers reported on peer acceptance in the classroom, fifth-grade teachers described internalizing symptoms, and grades assigned by sixth-grade teachers served as the outcome measure of academic performance. Self-reports were obtained at one point in time: Children described their academic self-concept in fifth grade.

The assumptions of multivariate normality and linearity were evaluated with SPSS and EQS. The data were significantly non-normally distributed (Mardia's standardized coefficient = 4.77, $p < .01$). Scores more than 3.3 SDs away from the mean were counted as outliers (Tabachnick & Fidell, 2001). There were five univariate outliers and one multivariate outlier (raw scores are indicated in parentheses). The multivariate outlier was a boy more than 3.3 SDs above the mean on internalizing symptoms at Time 1 (0.89) and Time 2 (0.78). The univariate outliers were as follows: 1 boy and 1 girl more than 3.3 SDs above the mean on internalizing symptoms (0.89 and 1.03, respectively) at Time 1; 1 girl more than 3.3 SDs below the mean on academic performance (−2.69) at Time 1; 1 boy more than 3.3 SDs below the mean on academic self-concept (1.50) at Time 2; and 1 girl more than 3.3 SDs above the mean on internalizing symptoms (0.47) at Time 2. Because the variables were significantly nonnormally distributed, robust maximum-likelihood estimation and the Satorra–Bentler scaled chi-square were used for all of the path analysis models. The standard errors associated with the parameter estimates were also adjusted for the extent of the nonnormality (Bentler & Dijkstra, 1985; Satorra & Bentler, 1988).

The pattern of missing data met the assumptions for missing completely at random (MCAR), Little's MCAR $\chi^2(86, N = 248) = 134.51$, $p = .001$; therefore the EM (expectation maximization) algorithm in SPSS 11.5 was used to impute data for variables with less than 8% of data missing (Little, 1988). T tests were examined for all pairwise patterns of missing data. To control for Type I error, we used a probability value of .001. None of the tests was significant; therefore, we concluded that the data were certainly missing at random and probably missing completely at random. Data were imputed on the basis of the unrestricted covariance matrix for two variables in the path analysis: children's academic self-concept in fifth grade, which had 17 cases (or 7.3%) of missing data, and teachers' reports of peer acceptance in fourth grade, which had 3 cases (or 1.2%) of missing data. Data were not imputed for the two variables with more than 8% of data missing. There were 44 cases (or 17.7%) of data missing for fifth-grade teachers' reports of children's internalizing symptoms and 41 cases (or 16.5%) of data missing for sixth-grade academic performance. These variables contained a total of 204 and 207 usable cases, respectively.

Cross-Sectional Correlations

First, we established that there was a significant association between peer relations and academic performance. Cross-sectional partial correlations between the lack of peer acceptance predictor variable and the academic performance outcome variable, with the classroom effect removed, when children were in the fourth, fifth, and sixth grades, are presented in Table 1. All three correlations were in the predicted direction and reached a conventional level of statistical significance, ranging from −.29 to −.49 ($p < .01$). Less

peer acceptance in the classroom was consistently associated with poorer academic performance when we controlled for nesting within classrooms.

Longitudinal Multiple Regression Analyses

Next, in order to assess causal priority, we tested each path in our conceptual model in separate hierarchical multiple regressions. As shown in Table 2, the analysis controlled for the earlier level of the outcome variable in the path, and dummy codes were entered to represent students' fourth- and fifth-grade classroom assignments, in accordance with Cohen et al. (2003). The regression analysis asked, for example, whether a lack of peer acceptance would predict future academic performance after earlier levels of academic performance were controlled. In this example, the longitudinal association was tested (while controlling for fourth- and fifth-grade classroom assignments in Step 1) by entering the earlier score on the academic performance outcome variable in Step 2 and entering the predictor variable, in this case lack of peer acceptance, in Step 3 to predict changes in later academic performance. With our participants distributed across 28 fourth-grade classrooms and 24 fifth-grade classrooms, our approach to controlling for the effects of classroom nesting represented a conservative test of the study's hypotheses and resulted in a significant reduction in the degrees of freedom in our analyses. Given the unidirectional nature of the hypotheses, one-tailed p values are presented for the t tests associated with the betas reported in Table 2.

The regression coefficients representing two of the five paths that are presented in Figure 1 reached statistical significance, and three coefficients were almost significant when prior levels of the outcome variable, as well as fourth- and fifth-grade classroom assignments, were taken into account. The first three sections of Table 2 present tests in which sixth-grade academic performance was the outcome variable, with controls for earlier academic performance in the fourth or fifth grade. A lack of peer acceptance in the fourth-grade classroom predicted children's academic performance in sixth grade, $R^2 = .46$, $F_{change}(1, 151) = 12.37$, $p < .01$, when academic performance in fourth grade and classroom assignments were controlled (Step 1: $R^2 = .25$, $p > .10$). Sixth-grade academic performance was marginally predicted by academic self-concept in fifth grade, $R^2 = .57$, $F_{change}(1, 154) = 2.27$, $p = .065$, when both academic performance in fifth grade and classroom assignment in fourth and fifth grades were controlled (Step 1: $R^2 = .21$, $p > .10$). Likewise, sixth-grade academic performance was marginally predicted by internalizing symptoms in fifth grade, $R^2 = .58$, $F_{change}(1, 141) = 2.44$, $p = .06$, when both academic performance in fifth grade and classroom assignments were controlled (Step1: $R^2 = .21$, $p > .10$).

In the next section of Table 2, fifth-grade academic self-concept is the outcome variable, predicted by fourth-grade peer acceptance, with academic self-concept in the fourth grade controlled. In the last section of Table 2, fifth-grade internalizing symptoms is the outcome variable, predicted by fourth-grade peer acceptance, with internalizing symptoms in the fourth grade controlled. Academic self-concept was significantly predicted by a lack of peer acceptance in fourth grade, $R^2 = .50$, $F_{change}(1, 195) = 7.86$, $p < .01$, when earlier academic self-concept and classroom assignments

Table 1
Cross-Sectional Correlations Among Variables at Three Time Points With Classroom Effect Removed

Variable	1	2	3	4
		4th grade (Time 1)		
1. Lack of peer acceptance	—	−.28*	.60*	−.47*
		(N = 248)	(N = 245)	(N = 230)
2. Academic self-concept		—	−.17*	.43*
			(N = 245)	(N = 230)
3. Internalizing symptoms			—	−.28*
				(N = 227)
4. Academic performance				—
		5th grade (Time 2)		
1. Lack of peer acceptance	—	−.23*	.52*	−.49*
		(N = 206)	(N = 205)	(N = 203)
2. Academic self-concept		—	−.18*	.37*
			(N = 204)	(N = 218)
3. Internalizing symptoms			—	−.28*
				(N = 201)
4. Academic performance				—
		6th grade (Time 3)		
1. Lack of peer acceptance	—	−.17*	.28*	−.29*
		(N = 154)	(N = 153)	(N = 150)
2. Academic self-concept		—	−.10	.45*
			(N = 152)	(N = 203)
3. Internalizing symptoms			—	−.14
				(N = 149)
4. Academic performance				—

* $p < .01$.

were controlled (Step 1: $R^2 = .21$, $p > .10$). Internalizing symptoms in fifth grade were marginally predicted by a lack of peer acceptance in fourth grade, $R^2 = .51$, $F_{change}(1, 158) = 2.56$, one-tailed $p = .055$, when internalizing symptoms in fourth grade and classroom assignments were controlled (Step 1: $R^2 = .42$, $p < .01$).

Thus, after we controlled for earlier levels of the outcome variable and classroom nesting in the fourth and fifth grades, a lack of peer acceptance in the classroom significantly improved prediction of children's academic self-concept, academic functioning, and to a lesser degree internalizing symptoms, 1 and 2 years later. Internalizing symptoms and academic self-concept contributed to the prediction of children's later academic performance when earlier academic performance and the nesting of students within classrooms were controlled.

The reverse path, predicting fifth-grade lack of peer acceptance from fourth-grade internalizing symptoms while controlling for fourth-grade lack of peer acceptance and classroom nesting, was also tested. The classroom effect was significant (Step 1: $R^2 = .30$, $p < .05$), indicating that children's fifth-grade lack of peer acceptance was associated with their classroom assignment. Moreover, internalizing symptoms in fourth grade marginally predicted lack of peer acceptance in fifth grade, $R^2 = .60$, $F_{change}(1, 159) = 2.43$, $p = .06$, suggesting that a lack of peer acceptance may be partially explained by prior internalizing symptoms.

Path Analysis

We hypothesized that the association between peer acceptance and academic performance is mediated by academic self-concept and internalizing symptoms. The conceptual model depicting the hypothesized mediation is presented in Figure 1. Rectangles represent the measured variables. A line connecting variables indicates a hypothesized relationship, with the arrow pointing to the outcome variable. Recall that child self-report data from the fifth grade and data collected from different teachers across all 3 years were used in the path analysis. A lack of peer acceptance was represented by fourth-grade teachers' reports of children's peer acceptance. Academic performance was the combined average of students' sixth-grade math and reading grades. Academic self-concept was based on children's perceptions of their academic abilities in the fifth grade, and internalizing symptoms were measured by fifth-grade teacher reports.

The path analysis was run on residual scores, with variance due to fourth- and fifth-grade classroom nesting removed. The independence model testing the null hypothesis, that the variables are uncorrelated with each other, was rejected: robust $\chi^2(6, N = 185) = 70.16$, $p < .05$. The hypothesized model reproduced the sample covariance matrix well: Satorra-Bentler scaled $\chi^2(1, N = 185) = 0.47$, $p = .49$ and comparative fit index (CFI) = 1.00. When the direct path from fourth-grade lack of peer acceptance to sixth-grade academic performance was removed, the model was

Table 2
Longitudinal Hierarchical Regression Analyses With Classroom Controlled

Variable	B	SE B	β	t
Predicting academic performance in 6th grade from lack of peer acceptance in 4th grade (N = 204)				
Step 1				
Classroom codes				
Step 2				
Academic performance (T1)	.54	.08	.48	6.60*
Step 3				
Academic performance (T1)	.39	.09	.35	4.28*
Lack of peer acceptance (T1)	−.28	.08	−.28	−3.52*
Predicting academic performance in 6th grade from the proposed mediator academic self-concept in 5th grade (N = 197)				
Step 1				
Classroom codes				
Step 2				
Academic performance (T2)	.73	.07	.72	11.24*
Step 3				
Academic performance (T2)	.69	.07	.69	10.04*
Academic self-concept (T2)	.16	.11	.10	1.51†
Predicting academic performance in 6th grade from the proposed mediator internalizing symptoms in 5th grade (N = 184)				
Step 1				
Classroom codes				
Step 2				
Academic performance (T2)	.70	.064	.74	11.04*
Step 3				
Academic performance (T2)	.68	.07	.71	10.48*
Internalizing symptoms (T2)	−.98	.63	−.12	−1.56†
Predicting academic self-concept in 5th grade from lack of peer acceptance in 4th grade (N = 246)				
Step 1				
Classroom codes				
Step 2				
Academic self-concept (T1)	.50	.05	.59	9.97*
Step 3				
Academic self-concept (T1)	.46	.05	.54	9.01*
Lack of peer acceptance (T1)	.04	.01	.19	−2.80*
Predicting internalizing symptoms in 5th grade from lack of peer acceptance in 4th grade (N = 204)				
Step 1				
Classroom codes				
Step 2				
Internalizing symptoms (T1)	.19	.04	.34	4.96*
Step 3				
Internalizing symptoms (T1)	.15	.05	.26	3.03*
Lack of peer acceptance (T1)	.01	.07	.13	1.60†

Note. Classroom codes were entered in Step 1 as a control for students' 4th- and 5th-grade classroom assignments. T1 = Time 1 (4th grade); T2 = Time 2 (5th grade).
One-tailed p values: * $p < .01$. † $p < .10$.

significantly degraded (Satorra–Bentler scaled chi-square difference = 25.96, $p < .01$). The following analyses reflect tests of the entire model.

A lack of peer acceptance in the fourth grade directly predicted poor academic performance in the sixth grade (unstandardized coefficient = −.45, $p < .05$) as well as a lower academic self-concept (unstandardized coefficient = −.16, $p < .05$) and more internalizing symptoms in the fifth grade (unstandardized coefficient = .03, $p < .05$). In turn, academic performance was predicted by academic self-concept (unstandardized coefficient = .32, $p < .05$) and internalizing symptoms (unstandardized coefficient = −1.00, $p < .10$).

Intervening Variables

Indirect effects were tested by following a procedure demonstrated to have greater power than traditional tests of mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Fifth-grade academic self-concept and internalizing symptoms served as intervening variables between peer acceptance in fourth grade and academic performance in sixth grade (indirect effect = −.076, $p < .05$). A lack of peer acceptance predicted a lower academic self-concept, and in turn, a lower academic self-concept was associated with poorer academic performance. A lack of peer acceptance also predicted more internalizing symptoms, and more internalizing symptoms were associated with lower levels of academic performance. Unstandardized coefficients (and standardized coefficients in parentheses) are reported in the path model in Figure 2. This model shows that children who were less accepted by their peers had a lower academic self-concept and more internalizing problems, which in turn predicted poorer academic performance.

Gender

A multiple group comparison strategy was used to test for gender differences. First, models were tested separately for boys and girls. After establishing good-fitting models in both groups, we estimated the models simultaneously to establish a baseline model in which the prediction paths were allowed to be freely estimated in both groups. Next, a model was estimated that forced (constrained) the prediction paths for the boys and girls to be the same value. This nested model was then statistically compared to the model with the paths estimated separately. A significant difference between models would indicate that gender moderated the associations within the model, whereas a nonsignificant difference would indicate that the associations among variables were similar for boys and girls.

Models were tested separately for boys, Satorra–Bentler scaled $\chi^2(1, N = 131) = 1.51$, $p > .05$, CFI = .986, and girls, Satorra–Bentler scaled $\chi^2(1, N = 116) = 0.24$, $p > .05$, CFI = 1.00. The baseline model without constraints, Satorra–Bentler scaled $\chi^2(2, N = 248) = 2.16$, $p > .05$, CFI = .997, and the model with regression paths constrained, Satorra–Bentler scaled $\chi^2(7, N = 248) = 5.70$, $p > .05$, CFI = 1.00, did not differ significantly: Satorra–Bentler scaled χ^2 difference $(5, N = 248) = 3.50$, $p > .05$ (Satorra, 2000). Therefore, it appears that gender did not moderate the associations among variables in the model. That is, the associations tested were the same for girls and boys.

Discussion

The results of this study suggest that problems with peer acceptance in the classroom are of legitimate concern to schools. Peer
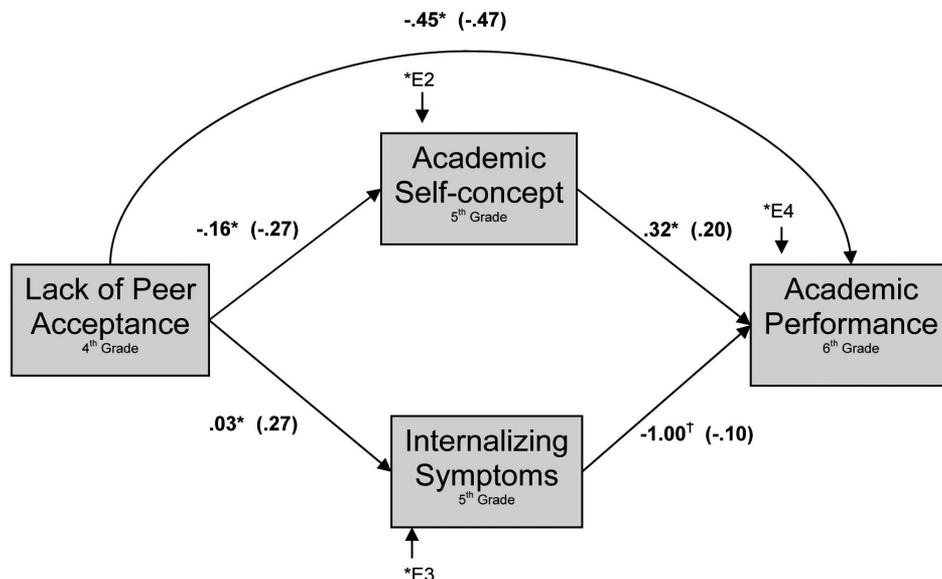
Figure 2. Path analysis results testing the mediational model. Unstandardized coefficients are reported (with standardized coefficients in parentheses). Two-tailed *p* values: †*p* < .10. **p* < .05.

problems affect children's self-concept, mental health, and consequently, performance in school. First, the results replicate findings from previous studies linking problematic peer relations with academic performance. Children who were perceived by their teachers as lacking acceptance by their peers demonstrated poorer academic outcomes. A lack of peer acceptance explained as much as one fourth of the variance in academic performance. Second, the association held across reports from different informants, which suggests that the findings were not merely the result of a methodological artifact. Third, the present findings extend previous research by demonstrating, through a series of multiple regressions, that a lack of peer acceptance predicted declines in academic performance measured over 3 years. The effects of a lack of peer acceptance were pervasive, extending beyond poor concurrent performance to predict decrements in academic performance over time.

Given the strength of the association between children's peer relationships and academic performance, the next step for researchers is to understand how peer acceptance influences academic performance. Therefore, an important contribution of this study is the model that was tested, which proposed at least two ways in which classroom social experiences can affect children's scholastic performance. The path analysis indicated that academic self-concept and internalizing symptoms help to mediate an association between social relations in the classroom and academic performance. These findings highlight interconnections among different aspects of development during childhood. Social, emotional, and cognitive development are fundamentally interrelated. Although perhaps less intuitive than the encouragement of good study habits to promote cognitive development, the results reported here suggest that the promotion of positive relationships with peers can contribute not only to children's social development but to their emotional and cognitive development as well.

These findings underscore the need to recognize and intervene with children who are having social difficulties in the classroom. Our measures of social acceptance suggest that teachers can play a key role, as they appear to know who these children are and are able to identify signs of peer problems. Our findings also suggest multiple benefits to timely and effective interventions in terms of the potential for increased psychological well-being, improved self-concept, and better academic achievement.

An alternative pathway, predicting lack of peer acceptance from earlier internalizing symptoms, was almost significant. This finding suggests that the association between internalizing symptoms and a lack of peer acceptance may be reciprocal in nature. Internalizing symptoms can contribute to later peer problems, and likewise, a lack of peer acceptance is predictive of later internalizing behavior.

These findings are based solely on within-classroom variances and covariances. Prior to estimation of the regression and path analysis models, the between-groups effects of 28 fourth-grade classrooms and 24 fifth-grade classrooms were partialed out. Accounting for clustering reduced the strength of the association between internalizing symptoms and academic performance in the path analysis. The strength of the associations in the hierarchical regression analyses was similarly weakened and less variance in the outcome variables was accounted for by the predictors when classroom variance was removed. The presence of a classroom effect might suggest that some teachers are more inclined to report certain types of behaviors or might also reflect the nonrandom nature of classroom assignments. That is, children may be purposely grouped together according to shared characteristics.

The results of this study raise a number of interesting questions that should be investigated in future research. For example, how do the mediating roles played by internalizing symptoms and academic self-concept relate to other psychological variables, such as

motivation and valuing of academic learning, that also predict changes in academic outcomes over time? In addition to testing a select number of mediator variables, the present study is limited by its reliance on teachers' reports as the sole indicator of peer acceptance as well as by the homogeneity of the present sample in terms of characteristics such as socioeconomic status and ethnicity. Future research would be strengthened by including peer nominations as a measure of peer acceptance. The applicability of these findings should be explored and alternative pathways tested in diverse samples. For example, do these processes operate similarly among children from diverse ethnic and cultural backgrounds? Would the associations reported here differ during adolescence, a period when the importance of peers increases? Consideration of other social systems both inside and outside of school, such as teachers and family members, may offer additional important insights into how to optimally promote children's academic achievement.

Despite the limitations of this study, the findings indicate that the unique social climate that children experience at school contributes to their psychological adjustment and school performance and should not be ignored. Problems with peers may not be widely recognized by teachers and parents as important in the achievement of academic goals. However, this study highlights the need for educators to be aware of the role that social experiences play in children's psychological and academic functioning. In order to promote students' academic performance in the classroom, educators should also promote their social and emotional adjustment.

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