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The Impact of Children's Social Adjustment on Academic Outcomes

Melissa E. DeRosier and
3-C Institute for Social Development, Cary, North Carolina, USA

Stacey W. Lloyd
University of North Carolina at Chapel Hill

Abstract

This study tested whether social adjustment added to the prediction of academic outcomes above and beyond prior academic functioning. School records and peer-, teacher-, and self-report measures were collected for 1,255 third grade children in the fall and spring of the school year. Social acceptance by and aggression with peers were included as measures of social adjustment. Academic outcomes included math and reading GPA, classroom behavior, academic self-esteem, and absenteeism. As expected, support for the causal model was found where both forms of social adjustment contributed independently to the prediction of each area of academic adjustment. Gender differences in the patterns of results were present, particularly for the impact of aggression on academic adjustment. Discussion focuses on the implications for social-emotional literacy programs to prevent negative academic outcomes.

From the time children enter school, peers take on an increasingly meaningful and influential role becoming key providers of support, companionship, advice, and affirmation (Furman & Buhrmester, 1992). A large body of literature supports the link between the quality of children's peer relations at school and their academic, behavioral, and emotional adjustment (see reviews Kupersmidt & DeRosier, 2004; Parker, Rubin, Price & DeRosier, 1995). While most of this research has focused on behavioral and emotional outcomes, the connection between social and academic adjustment has been repeatedly demonstrated (see review Zins, Weissberg, Wang, & Walberg, 2004). Children with positive peer relations tend to perform higher academically whereas children with peer problems tend to experience a wide range of academic difficulties, including low school engagement (e.g., Kuperminc, Leadbeater, & Blatt, 2000), poor academic achievement (e.g., Guay et. al., 1999), high absenteeism (e.g., DeRosier, Kupersmidt, & Patterson, 1994), and dropping out of school (e.g., Cairns, Cairns, & Neckerman, 1999).

While substantial evidence links children's social and academic functioning, most studies to date have been cross-sectional or correlational indicating that problems in one area tend to co-occur with problems in the other area. Relatively little longitudinal research has been conducted to examine how these areas of school-based adjustment impact one another over time. Further, currently available longitudinal research linking social and academic adjustment has focused primarily on adolescence (see O'Neil, 1997 for review). Though extreme negative academic outcomes, such as academic failure and drop-out, tend to manifest themselves in adolescence, the roots of these problems begin in childhood and develop over time (Carter & Wilson, 1991; Greene, 2003; Kupersmidt & DeRosier, 2004;

Correspondence concerning the manuscript should be addressed to Melissa E. DeRosier at 3-C ISD, 1901 North Harrison Avenue, Suite 200, Cary, NC 27513, or by derosier@3cisd.com.

USDE, 2006). Middle childhood is a time when both peer and academic challenges intensify, providing fertile ground for difficulties in adjustment (Coie, 1990; Greenberg, Domitrovich, Bumbarger, 2001). As a result of the dearth of longitudinal research with elementary school children, little is known about the degree to which social problems contribute to the development of academic problems during middle childhood (see Kupersmidt & DeRosier, 2004 and Parker, Rubin, Erath, Wojslawosicz, & Buskirk, 2006 for reviews). The primary purpose of this study was increase our understanding of how children's social adjustment is predictive of their academic adjustment over the course of the third grade school year.

We focused our investigation on two areas of social adjustment that have been repeatedly linked with children's academic performance. First, a great deal of research on children's peer relations has focused on *social acceptance* or the degree to which a child is liked by their same-grade peers at school as opposed to disliked or rejected by them (Coie, Dodge, & Coppotelli, 1984). Over the past several decades, research has consistently supported the construct and predictive validity of social acceptance (Cillessen & Bukowski, 2000; Kupersmidt & Dodge, 2004; Parker et. al., 2006). Children with high social acceptance tend to experience positive academic, social, and behavioral adjustment both concurrently and in the future. Conversely, children with low social acceptance (e.g., peer rejected) tend to experience concurrent problems across these domains and are at substantial risk for a myriad of later negative outcomes, including suicide (e.g., Carney, 2000), drug abuse (e.g., Spooner, 1999), educational underachievement (e.g., Woodward & Fergusson, 2000), delinquency and antisocial behavior (e.g., Brendgen, Vitaro, & Bukowski, 1998), and depression (e.g., Boivin & Hymel, 1997).

Low social acceptance contributes to academic difficulties in a number of ways. Experiencing peer rejection can produce heightened anxiety (e.g., worry over being teased or left out) which interferes with concentration in the classroom and impedes children's acquisition and retention of information (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001; Sharp, 1995). Children who lack friends in the classroom tend to have lower academic self-esteem and depend upon teachers to a greater extent for academic assistance (i.e., seek help from teachers more frequently) compared to socially accepted children (Flook, Repetti, eg. al., 2005; Mercer & DeRosier, in press). When children have few friends or fear being bullied or teased (a frequent experience of rejected children; see Boivin, Hymel, & Hodges, 2001 for review), they tend to avoid school resulting in more frequent absences and, thus, fewer opportunities to learn academic skills in the classroom (DeRosier, et. al., 1994; Eaton, Kann, Kinchen, et. al., 2007).

Our second measure of social adjustment for this study was *aggressive behavior* with peers. Aggression and social acceptance are related to one another in that aggressive children are more likely to be rejected by their peers (Haselager, Cillessen, Van Lieshout, Riksen-Walraven, & Hartup, 2002). However, aggression represents an independent risk factor that has been found to add to the prediction of negative outcomes beyond social acceptance (see Coie & Dodge, 1998 for review). When physical and verbal aggression persists at a high level compared to developmental norms (e.g., significantly decline as children enter middle childhood), aggressive children are particularly likely to experience concomitant and future academic, social, and behavioral problems (see Parker et. al., 2006 for review).

Aggressive children tend to demonstrate lower achievement compared with non-aggressive peers (Hinshaw, 1992). While aggression correlates at a negligible or modest degree with IQ and general cognitive ability, aggression is highly related to underachievement, including lower GPA and school failure (e.g., Feshbach & Price, 2004; Risi, Gerhardstein, & Kistner, 2003). The poor academic performance of aggressive children may, in part, be due to

heightened levels of conflict with teachers and school officials. Aggressive, externalizing behavior problems create classroom disruption which often results in disciplinary actions, including suspension and expulsion (Coie & Dodge, 1998). Further, aggressive children tend to see school discipline as overly harsh and unfairly applied (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Kuperminc et. al., 2000). Because the school environment is seen as negative and unsupportive, aggressive children may disengage, resulting in heightened risk of truancy and school drop-out (Graham, Bellmore, & Mize, 2006; Kupersmidt and Coie, 1990; Rigby & Slee, 1992).

Different theoretical models have been posed to help us understand the link between academic and social difficulties. The *incidental model* suggests that problems in early childhood peer relations are an artifact of other underlying disorders or deviancies, such that peer problems are merely incidental to other causal processes (Parker & Asher, 1987). According to the incidental model, social and academic problems may occur together in a correlational fashion, but social problems do not independently predict academic problems. Conversely, the *causal model* suggests that academic problems are causally related to earlier disruption in socialization processes, such that peer problems contribute independently to the prediction of later academic difficulties (DeRosier et. al., 1994; Kupersmidt & DeRosier 2004; Parker & Asher, 1987).

In this study, we examined the degree to which social acceptance and aggression contributed to the prediction of a broad spectrum of academic outcomes at the end of third grade. As reviewed above, our selection of academic outcomes was based on past research linking each area with social adjustment (social acceptance and/or aggression), including: grade point average (GPA) for reading and math, school absenteeism, classroom disruptive behavior, help-seeking behavior for academic problems, and academic self-esteem. Given the high degree of stability in academic functioning, the predictive strength of social adjustment for academic outcomes in the spring was investigated after controlling for academic functioning in the fall. We expected to find support for the causal model where social adjustment would significantly add to the prediction of academic adjustment above and beyond the prediction due to prior academic adjustment.

While social adjustment was expected to contribute independently to academic outcomes, gender differences in the pattern of results were also expected. Prior research indicates significant gender differences in the social and academic areas of adjustment included in this study. Socially, there is considerable gender segregation in children's play groups during middle childhood (Zarbatany, Hartmann, & Rankin, 1990). Female play groups tend to be smaller, involving more intimacy and verbal sharing, compared to those of males which tend to be bigger, involving more active, competitive activities (Maccoby, 1998). The behaviors and social skills associated with social acceptance vs. rejection also differ for males and females (LaGreca, 1981). In particular, males are more likely to display aggressive behaviors than are females and aggression is seen as more normative for males than females at this age (Cook, 1992; Eagly & Steffen, 1986).

Gender differences for specific academic skills have been extensively studied (see Nowell & Hedges, 1998 for review). In general, findings indicate females perform higher in areas of verbal ability and males perform higher in areas of mathematical ability. Males tend to report higher academic self-esteem than females, though there is considerable variation depending on age and academic area assessed (see Skaalvik & Skaalvik, 2004 for review). In addition, the link between academic and social areas of adjustment appears to vary by gender. For example, the relation between aggression and school drop-out is more pronounced for males than females (French, 1988; Graham et. al., 2006). Also, social acceptance influences academic self-esteem and subsequent risk for academic difficulties to

a greater extent for females than males (Lopez and DuBois, 2005). Approximately equal numbers of males and females were included in this study. We expected to find gender differences in the pattern of results, particularly with regard to the impact of aggression on academic adjustment.

In sum, this study was designed to test whether social adjustment, in the forms of social acceptance and aggression, significantly and independently predicted academic achievement, absenteeism, academic self-esteem, classroom disruptive behavior, and academic help-seeking behavior. We hypothesized that each form of social adjustment would add to the prediction of each academic outcome above and beyond the prediction due to prior level of that outcome. Thus, support for the causal model was expected. We also hypothesized that gender differences would be present across the patterns of results such that social adjustment, particularly aggression, would impact later academic adjustment differently for males versus females.

Methods

Participants

Eleven public elementary schools from the Wake County Public School System (WCPSS) in North Carolina participated in the study. In September, parent information letters describing the research project, including data collection procedures, were mailed to the home of each third grade student attending regular education classrooms within the 11 schools. Parents returned the consent form to their child's classroom teacher. Of the total pool of 1374 third grade students, parental consent for data collection was obtained for 1255 students (91%). The sample was evenly distributed across genders (50.9 % female, 49.1 % male) with a mean age of 8.6 years (range = 7.8 to 10.9). The approximate racial distribution was 73% White (5% of Hispanic origin), 20% African-American, 4% Asian, and 3% mixed race. The communities from which the sample was drawn included families with socioeconomic status from lower to upper-middle class.

Procedure

As part of a larger longitudinal project, pencil-and-paper questionnaires were group administered to children in their classroom by trained staff members. Identical measures were collected at two time-points, six months apart, in October (Time 1) and April (Time 2). Using a standardized data collection script, children completed peer nomination sociometric items followed by self-report questionnaires. Teachers were individually interviewed by a trained staff member in a separate room while their students completed questionnaires. School records provided information regarding gender, race, absenteeism, and grades from report cards (GPA).

Measures

In the assessment of children's adjustment, teacher-, peer-, and self-report can vary widely (Achenbach et. al., 1987; Cillessen, Terry, Coie, & Lochman, 1992; Olson & Brodfeld, 1991). Child self-report tends to be the most accurate indicator of internal processes, such as self-esteem, whereas outsiders' reports (e.g., teachers, peers) are generally better sources of information about externally visible behaviors, such as disruptiveness (Loeber, Green, & Lahey, 1990); Routh, 1990). Due to differing opportunities to observe social interactions and differing expectations for behavior, teachers and peers provide somewhat different views of children's social adjustment (Cillessen et. al., 1992; Olson & Brodfeld, 1991). In the proposed study, composite scores across multiple informants and/or measures were used in an effort to obtain a reliable and thorough assessment of children's functioning as well as to

reduce bias associated with single instrument measurement error in statistical analyses (Coffman & MacCallum, 2005).

Social Adjustment—Children's social adjustment was assessed in two areas: social acceptance and aggressive behavior with peers.

Social acceptance: The social acceptance construct was created by combining peer- and teacher-report of peer liking and disliking for each child. Peer nominations were group-administered in the classroom setting using traditional sociometric methodology (Coie, Dodge & Coppotelli, 1982). Using unlimited nominations, children were asked to nominate all the peers in their grade who they (1) like the most and (2) like the least. Unlimited nominations have been shown to decrease error variance and improve stability and reliability in the measurement of children's peer relations (Terry, 1994). The number of nominations a child received for each sociometric item was summed and standardized within nominating group (i.e., across grade at school). Social acceptance was calculated by subtracting peer disliking from peer liking and standardizing this difference within nominating group (Coie et. al.). Support has been provided for the predictive and concurrent validity of sociometric methodology as well as its stability over time and across settings (see Cillessen, Bukowski, & Haselager, 2000).

Teachers provided parallel assessment of children's social acceptance during an interview about the students in their class. Teachers rated how much each child was liked or disliked by other children in his/her grade at school (Terry, Underwood, & Coie, 1994). Ratings were made on a 7-point scale from (1) *Never True* to (7) *Almost Always True*. As with the peer-report, teacher-rated social acceptance was calculated by subtracting peer disliking from peer liking and standardizing this difference within nominating group (i.e., across classroom within school). Teacher- and peer-reports of social acceptance were correlated (at Time 1: $r = .54$, $p < .0001$) with one another, but not redundant, and each showed significant stability over the school year ($r = .58$ for teacher-report, $p < .0001$; $r = .78$ for peer-report, $p < .0001$). The composite social acceptance score was created by averaging across the teacher and peer social acceptance scores.

Aggression: Children's aggressive behavior with peers was also assessed through combined peer- and teacher-report. Using unlimited peer nominations, children were asked to nominate all the peers in their grade who are often physically (hit, kick, punch others) or verbally (say mean things) aggressive with peers (Coie et. al., 1982). The number of nominations a child received was summed and standardized across grade within school. This sociometric item has considerable support as a valid, reliable measure of children's aggressive behavior with peers (see Coie & Dodge, 1998 for review).

As part of the teacher interview, using the same scale as that described above, teachers rated how aggressive each child in their class was with other children in five areas: starts physical or verbal fights, says mean things, overreacts with anger, bullies others, and uses physical force to get his/her way. Excellent internal consistency was found across these five items (Cronbach's $\alpha = .86$, $p < .0001$) which were averaged to form the teacher-report aggression scale.

Teacher- and peer-reports of aggression were positively correlated (at Time 1: $r = .63$, $p < .0001$) with one another and each showed significant stability over the school year ($r = .75$ for teacher-report, $p < .0001$; $r = .82$ for peer-report, $p < .0001$). The composite aggressive behavior score was created by averaging across the teacher and peer aggression scores.

Classroom Conduct—Teachers rated the degree to which students engaged in disruptive classroom behavior across five areas: bothers others when they are trying to work, acts silly or immature, makes off-task comments, behaves inappropriately, and makes odd noises. For each behavioral description, teachers rated the degree to which that description was true of each child in his/her classroom. Ratings were made on a 7-point scale ranging from (1) *Never True of this child* to (7) *Almost Always True of this child*. High internal consistency was present across these five items (at Time 1: Cronbach's α = .90). Conduct grades from report cards were also attained for students which correlated significantly and negatively with teacher ratings of classroom disruptiveness (at Time 1: r = -.47, p < .0001). The composite classroom conduct score was created by averaging across the teacher ratings and conduct grade point average (GPA) scores with higher scores indicating better classroom conduct.

Academic Performance—Teachers were asked to rate the degree to which students perform poorly in reading and math (separately) on the same 7-point scale. Students' GPA in reading and math were also attained through school records of report card grades. Teacher ratings were significantly negatively correlated with GPA in the corresponding area (at Time 1: r = -.69 for reading, p < .0001; r = -.70 for math, p < .0001). Composite academic performance scores for reading and math were calculated separately by averaging the corresponding GPA and teacher rating so that higher scores indicated higher academic performance.

Academic Help-seeking—Teachers provided a global rating of the degree to which each child required help from teachers for academic problems on a 5-point scale ranging from (1) *Almost Never* to (5) *Very Often* (Mercer & DeRosier, in press). Help could be either directly requested by the child or in the form of the teacher needing to intervene in order to assist the child with an academic task. This item showed excellent stability over the school year (fall to spring r = .75, p < .0001).

Academic Self-concept—Two self-report measures were used to assess children's academic self-concept. First, the *Self Perception Profile for Children* (Harter, 1985) includes six items that contrast satisfaction (e.g., "Some kids are feel that they are very good at their school work") versus dissatisfaction (e.g., "Other kids worry about whether they can do the school work assigned to them") with one's academic performance. Children rate each item on a 4-point bipolar scale indicating which descriptor is more true for them and to what extent ("Very True" versus "Sort of True"). Scores are averaged to form a scale with higher scores indicating higher academic self-esteem. This measure is widely used with considerable psychometric data supporting its reliability and validity (see Harter, 1985; Harter, 1990).

Second, academic motivation was assessed using the *Areas of Motivation Scale* (DeRosier, 1997). This scale includes four items on which children rate the degree to which it is important for them to achieve well academically (on school work, grades, in classes, on tests) on a 6-point scale ranging from (1) *Not At All* to (6) *Very, Very Important*. High internal consistency was present across these four items (at Time 1: Cronbach's α = .76) and prior research has demonstrated good test-retest reliability (ICC = .71 over a one week period, p < .0001) for this scale (DeRosier, 1997). Academic self-esteem and motivation were significantly correlated (at Time 1: r = .27, p < .0001). The composite academic self-concept score was created by averaging across these two scales with higher scores indicating higher academic self-concept.

Absenteeism—As part of the teacher interview, teachers rated the degree to which students were frequently absent from school on the 7-point scale ranging from (1) *Never*

True of this child to (7) *Almost Always True of this child*. Number of days absent and present at school were also collected from school records. Absenteeism was calculated as the number of days absent divided by the total number of days in the school year to date (i.e., a percentage of the total). The teacher rating and school records of absenteeism were significantly correlated (at Time 1: $r = .44$, $p < .0001$). The composite absenteeism score was created by averaging across these scores with higher scores indicating higher levels of absenteeism.

Results

Overview

The results are divided into four sections. First, sample attrition was examined to test for differences between children who remained in the sample throughout the school year versus those who left the sample prior to spring data collection. In the second section, the inter-relations among academic outcomes at the two time points were examined as well as the stability in children's academic adjustment over the school year. Third, correlations between children's social and academic adjustment at each time point was examined. In the fourth section, analyses of covariance (ANCOVAs) were conducted to test the degree to which social adjustment predicted academic outcomes in the spring, controlling for fall levels of these outcomes. Gender differences in the predictive patterns were also examined.

Attrition

Attrition analyses were conducted in order to test for differences between children who were stable versus transient between the fall and spring of third grade. Of the total sample at Time 1 (n=1255), 62 children were not present at Time 2, resulting in 95% stability across time points. Chi-square analyses revealed that there were no significant gender or racial group differences in the children who remained in the sample versus those who left prior to the spring data collection. However, a Multivariate Analysis of Variance (MANOVA) across Time 1 academic and social adjustment areas revealed significant selective attrition ($F(7, 1146) = 17.77$, p<.0001). Univariate and post hoc analyses showed that children who left the sample prior to spring data collection were significantly more disruptive in the classroom ($F(1, 1152) = 58.06$, p<.0001), more help-seeking with teachers ($F(1, 1152) = 6.32$, p<.05), and more frequently absent from school ($F(1, 1152) = 5.73$, p<.05) in the fall compared to children who remained in the sample. n addition, children who remained in the sample were more socially accepted ($F(1, 1152) = 5.01$, p<.05) than children who left school prior to spring data collection. Given that selective sample attrition was found, regression analyses were conducted to generate residual scores controlling for the impact of attrition on Time 1 social and academic adjustment scores. These residual scores were used for all subsequent analyses involving Time 1 adjustment measures.

Relations Among Academic Outcomes

In order to examine the inter-relations among the six academic outcomes, correlations were computed at each time point. Table 1 displays these correlations as well as stability coefficients (along the diagonal) across the two time points for each academic outcome. As Table 1 shows, the patterns of inter-correlations were highly similar across each of the two time points. Absenteeism was negatively correlated with academic achievement in math and reading as well as academic self-esteem. More frequent absenteeism was also associated with more disruptive classroom behavior and more help-seeking for academic problems. Math and reading achievement were highly positively correlated with one another and each was positively correlated with academic self-esteem. Higher math and reading achievement levels were also associated with lower classroom disruptiveness and lower help-seeking for academic problems. Classroom disruption and help-seeking behavior were positively

correlated with one another and each of these areas was negatively correlated with academic self-esteem.

All academic outcomes included in this study showed a high degree of stability over the school year. Math and reading GPA, classroom disruptive behavior, and help-seeking behavior were highly stable constructs. While absenteeism and academic self-esteem showed relatively lower stability, the stability of these outcomes was highly significant across the school year.

Inter-relations Between Social and Academic Adjustment

As Table 2 shows, correlational analyses were conducted to examine the relations between social adjustment and each area of academic adjustment. Social acceptance was positively correlated with achievement in reading and math as well as academic self-esteem. Higher social acceptance was associated with lower classroom disruptive behavior and less help-seeking behavior for academic problems. The relation between higher social acceptance and lower absenteeism was significant in the fall, but dropped out in the spring.

The pattern of inter-relations between aggression and academic adjustment was very similar to that of social acceptance, but in the opposite direction. Math and reading GPA and academic self-esteem were each negatively correlated with aggressive behavior. Higher levels of aggression were associated with more help-seeking from teachers and greater classroom disruptive behavior. Aggression was also positively associated with more frequent absenteeism.

Impact of Social Adjustment on Later Academic Adjustment

In order to investigate the degree to which social adjustment predicted later academic adjustment, a series of Analyses of Covariance (ANCOVAs) were conducted. Variables were entered into the ANCOVA model in a hierarchical fashion. For each Time 2 (spring) academic outcome, the corresponding Time 1 (fall) academic score was entered into the model first (i.e., partialled out) prior to examination of social adjustment indices. In this way, the impact of social adjustment on later academic adjustment was investigated above and beyond the prediction due to prior academic functioning. A variable representing the child's school was then included as a covariate in the model to control for differences in academic adjustment across the eleven schools included in this study. Then, the main effects for social acceptance at Time 1 and Time 2 and their two-way interaction were entered into the model. Last, the main effects for aggression at Time 1 and Time 2 and their two-way interaction were entered.

Given the hypothesis that predictive patterns would differ by gender, preliminary ANCOVAs were conducted to test this hypothesis. Following inclusion of covariates, gender was included in the model as a main effect as well as in interaction with social acceptance and aggression at each time point. Gender was found to be a significant main effect in the prediction of math GPA ($F(1, 1121) = 15.12$, $p<.0001$) and disruptive behavior ($F(1,1121) = 6.88$, $p<.01$). Males ($M = 4.35$, std $= 1.08$) demonstrated significantly higher math GPA at Time 2 than did females ($M = 4.13$, $SD = 1.22$). Males ($M = 2.01$, $SD = 1.03$) also exhibited significantly greater classroom disruptive behavior at Time 2 than did females ($M = 1.52$, $SD = 0.75$). In addition, each academic outcome demonstrated at least one significant interaction effect between gender and social adjustment though the specific interaction effect varied (e.g., with aggression vs. with social acceptance) depending on the outcome of interest. Therefore, based on evidence that the relation between social and academic adjustment was moderated by gender for each academic outcome, the ANCOVAs for each academic outcome were conducted separately by gender.

Table 3 displays the significant effects for social adjustment separately for males and females, including F-values, beta weights, and percent variance explained (R^2) for each academic outcome. Given the high degree of stability in academic adjustment over the school year, the covariates accounted for the majority of variance for each outcome. However, as expected, social adjustment was found to significantly add to the prediction of each academic adjustment, above and beyond the prediction due to prior academic functioning, for both males and females. All significant effects for social adjustment were main effects, except one interaction for disruptive behavior for females. The following summarizes the significant findings by gender.

Predictive Patterns for Males—For absenteeism, there was a significant effect for aggression at Time 2 with higher levels of aggressive behavior predicting higher levels of absenteeism. For math GPA, social acceptance at each time point contributed to the prediction as did aggression at Time 2. Males with higher social acceptance across the school year showed greater math achievement in the spring whereas males who were concurrently more aggressive in the spring showed lower math achievement. For reading GPA, aggression at each time point contributed to the prediction as did social acceptance at Time 2. Males who were more aggressive across the school year showed lower reading achievement in the spring whereas males with higher social acceptance in the spring demonstrated higher concurrent reading achievement.

Classroom disruptive behavior was predicted by social acceptance at each time point as well as aggression at Time 2. Lower social acceptance across the school year and higher concurrent levels of aggressive behavior each increased males' disruptive classroom behavior in the spring. In the prediction of help-seeking behavior for academic problems, social acceptance at each time point and aggression at each time point contributed significantly. Males with higher social acceptance sought academic help from teachers less often whereas males with higher aggressive behavior sought academic help from teachers more often. In the prediction of academic self-esteem, social acceptance at each time point was significant where males with higher social acceptance across the school year had higher academic self-esteem in the spring.

Predictive Patterns for Females—For absenteeism, there were significant effects for social acceptance at Time 1 and aggression at Time 2. Females with higher social acceptance in the fall were less frequently absent in the spring whereas females with higher levels of aggressive behavior in the spring showed greater concurrent levels of absenteeism. For math GPA, social acceptance at each time point and aggression at each time point contributed significantly. Females with higher social acceptance across the school year and females with lower aggressive behavior across the school year demonstrated greater math achievement in the spring. For reading GPA, social acceptance at each time point contributed to the prediction as did aggression at Time 1. Females who were more socially accepted across the school year demonstrated higher reading achievement in the spring whereas females who were more aggressive in the fall demonstrated lower reading achievement in the spring.

Classroom disruptive behavior was predicted by social acceptance at each time point and aggression at Time 2. With regard to the main effects, lower social acceptance across the school year and higher concurrent levels of aggressive behavior each increased females' disruptive classroom behavior in the spring. In addition, there was a significant two-way interaction between aggression at Time 1 by aggression at Time 2 for females. In order to clarify this interaction, females were sub-grouped according to their level of aggression at Time 1 (i.e., Non=less than 1 std below the mean, Low=between the mean and 1 std below the mean, Medium=between the mean and 1 std above the mean, or High=greater than 1 std

above the mean). Then, beta weights for aggression at Time 2 predicting classroom disruptive behavior at Time 2 were calculated for each sub-group. Figure 1 displays these trajectories. The relation between aggression and disruptive behavior in the spring was greatest for females who were non-aggressive in the fall. If females were highly aggressive in the fall, aggression in the spring did not significantly add to the prediction of their disruptive behavior problems in the spring.

In the prediction of help-seeking behavior for academic problems, social acceptance at each time point contributed significantly. Females with higher social acceptance across the school year sought academic help from teachers less often in the spring. In the prediction of academic self-esteem, social acceptance at Time 1 and aggression at Time 1 were significant where higher social acceptance and lower aggression in the fall were each predictive of higher academic self-esteem for females in the spring.

Discussion

Consistent with many other studies (see Kupersmidt & DeRosier, 2004; Parker et. al., 2006; and Zins et. al., 2004 for reviews), the correlational analyses from this study indicate that academic adjustment and our social indices of peer acceptance and aggression were concurrently related to one another at each time point. The magnitude and direction of these correlations were consistent with the literature showing that positive social and academic adjustment tend to co-occur. More importantly, beyond these correlational associations, this study provided clear support for the causal model linking social and academic functioning. As expected, each form of social adjustment added significantly to the prediction of each academic outcome above and beyond the prediction due to prior academic functioning. Thus, as the causal model stipulates, peer problems were found to contribute independently to the prediction of later academic difficulties, rather than simply co-occurring with them.

This finding is particularly remarkable given the high degree of stability in this study for academic outcomes across the third grade school year, especially GPA and classroom behaviors. In effect, such high stability leaves very little variance to explain in spring academic functioning beyond the variance explained by fall academic functioning. The fact that social adjustment added significantly to the prediction of each outcome underscores the relevance of the quality of children's peer relations for impacting academic adjustment during this age period. Middle childhood is a time of escalating social and academic demands and stressors (Parker et. al., 2006; Zins et. al., 2004). Helping children navigate their social environment during elementary school is a key to improving their academic functioning both concurrently and into the future. Clearly, further longitudinal research across the elementary school years is warranted to advance our understanding of the social roots of later negative academic outcomes, including academic failure and school drop-out (USDE, 2006; O'Neil, 1997).

For both males and females, social acceptance and aggression were each found to contribute to academic adjustment in the spring. While there were more consistencies than differences across the patterns of results, gender differences were evident with regard to the relative importance of social acceptance versus aggression for particular outcomes. The following briefly summarizes the results for each outcome across genders. For absenteeism, concurrent aggression increased absenteeism for both males and females, but social acceptance contributed to absenteeism only for females. Social acceptance at both time points impacted math GPA for both genders as did concurrent aggression, but prior aggression contributed to lower math GPA for females only. With regard to reading GPA, social acceptance played a larger role for females whereas aggression played a larger role for males. Social acceptance across the school year impacted classroom disruptive behavior for both genders as did

concurrent aggression. However, an interaction effect qualified this finding for females. When females showed a highly non-normative pattern of escalating aggression across the school year, aggression in the spring was most likely to increase classroom disruptive behavior. Higher social acceptance across the school year decreased help-seeking behavior for males and females, but aggression also contributed to higher help-seeking behavior only for males. For academic self-esteem, both social acceptance and aggression were predictive for females, but only social acceptance contributed to the prediction for males.

Overall, findings provide support for the broad hypothesis that social adjustment impacts later academic adjustment differently for males versus females. Sometimes this difference was one of magnitude, such as stronger relations between social acceptance and GPA for females. Other times, an area of social adjustment was predictive for one gender, but not the other, such as aggression adding to the prediction of academic help-seeking for males only. As expected, it was aggression that most frequently showed gender differences which likely reflects the impact of gender-specific norms for aggressive behavior on teachers' and peers' views of children at this age (Cook, 1992; Eagly & Steffen, 1986). However, more than the differences, this study indicates that both social acceptance and aggression are important social constructs to consider when examining academic outcomes for both genders.

This study should be considered in light of several limitations. First, though significant findings for social adjustment were found, the variance explained was generally small. The outcome measures used in this study were highly stable across the school year, such that relatively little variance was left to explain through predictive modeling. This limitation was particularly evident for outcomes that were based solely on teacher-report. Combining teacher-report with other sources of information, such as standardized tests or observations, would significantly increase the sensitivity of measurement for academic achievement and classroom behavior as well as decrease the impact of any teacher biases for these outcomes. Second, while support for the causal model was found, our study spanned only two time points. It is highly likely that the relation between social and academic adjustment over time does not adhere to a simple uni-directional model. Rather, as has been supported for behavioral and emotional outcomes, the relation between social and academic adjustment is most likely transactional in nature where each area influences the other area in a reciprocal manner over time (Parker et. al., 1995, 2006). For example, poor social acceptance may increase classroom disruptive behavior which, in turn, decreases social acceptance. To test the presence of the transactional model, future longitudinal studies should examine these inter-relations across multiple time points. Third, this study included only third grade so we were unable to examine whether results varied across different elementary school years. Future longitudinal research including multiple grade levels would be extremely useful for determining whether developmental shifts in these inter-relations occur across childhood.

In conclusion, the findings from this study have important implications for the prevention of negative academic outcomes, such as school failure and drop-out. Though these negative outcomes may actually occur during adolescence, the developmental processes by which children move down this negative path begin much earlier. This study underscores the impact of peer relations during the elementary school years on children's school engagement, academic self-esteem, classroom behavior, and academic achievement. Children's peer problems do not simply co-occur with academic problems, but rather contribute in a substantive way to academic failure versus success. Unfortunately, in the United States, the elementary school culture focuses teaching and learning almost exclusively on core academic subjects without attending to how more social and behavioral issues may contribute to children's academic progress. Further research is needed to fully understand how social and academic adjustment influence one another over the elementary school years. However, the findings from this study clearly indicate that our goal of

fostering academic success for our children would be furthered by considering children's social adjustment needs.

We know that as peer problems become more chronic or severe, children's risk for later negative outcomes, including academic failure, significantly increases (DeRosier et. al., 1994; Parker et. al., 2006; Zins et. al., 2004). However, this cycle can be ameliorated, if not broken, with the application of targeted, structured social-emotional literacy (SEL) interventions (Greenberg et. al., 2001). SEL programs focus on building children's social skills and positive peer relations while decreasing negative social behavior, such as aggression. A number of evidence-based SEL programs have been supported in the research literature. SEL interventions can be effectively applied in the elementary school setting via indicated programs, such as small group social skills training programs for children experiencing social problems (e.g., DeRosier, 2007), as well as universal classroom-based programs where all students participate equally (e.g., DeRosier & Mercer, 2007).

Given the evidence that social adjustment contributes independently in the prediction of academic adjustment (not simply in an incidental or correlational fashion), SEL intervention programs should be considered directly relevant to enhancing the academic performance and school adjustment of elementary-aged children. Schools should consider several factors when selecting an SEL program (see Fixsen, Naoom, Blase, Friedman, & Wallace, 2005 and Graczyk, Domitrovich, & Zins, in press, for reviews). First, it is critical the SEL program has a solid research-base demonstrating that use of this program results in significant benefits for children. Supporting research data should be rigorous (i.e., randomized control group trial) and published in a refereed journal. Replication of findings, particularly by researchers apart from the intervention developer, is a strong indicator of a program's evidence-base.

Second, the SEL program must be feasible for implementation in the school setting. Requiring excessive time or effort by school staff will undermine effective implementation. Interventions that provide school personnel with training opportunities, easy access to program materials, and on-going implementation assistance are much more likely to be used effectively and maintained by schools over time. In addition, SEL programs that are aligned with Standard Course of Study requirements for academic subjects, such as language arts, are much more easily integrated into everyday classroom use.

Third, it is important to consider the organizational climate within which the SEL program will be used. The degree to which school administrators promote, support, and reward (i.e., "buy-in") use of an SEL intervention either fosters or impedes adoption and effective use of the program by school personnel. Findings such as those provided through this study will hopefully contribute to the body of evidence needed to increase school organizational "buy-in" for SEL interventions and support use of SEL programs by schools to not only improve the social and behavioral adjustment of children experiencing peer problems, but also enhance the academic development of all children.

Acknowledgments

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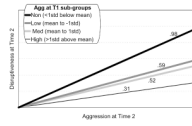
Figure 1. Standardized regression coefficients for disruptive and aggressive behavior of females in the spring as a function of aggressive sub-groups in the fall

Table 1

Correlations among areas of academic adjustment in the fall and spring.

Time 2	Time 1					
	1.	**2.**	**3.**	**4.**	**5.**	**6.**
1. Absenteeism	.45**	-.17**	-.11**	.12**	-.06*	.17**
2. Math GPA	-.09*	.79**	.78**	-.39**	.22**	-.70**
3. Reading GPA	-.06*	.79**	.81**	-.40**	.23**	-.73**
4. Classroom Disruption	.03	-.38**	-.37**	.82**	-.14**	.46**
5. Help-seeking	.10*	-.75**	-.75**	.46**	.75**	-.24**
6. Academic Self-esteem	-.08*	.29**	.33**	-.20**	-.32**	.42**

Note. Stability coefficients are displayed along the diagonal in shaded boxes. Correlations among academic outcomes at Time 1 appear above the diagonal. Correlations among academic outcomes at Time 2 appear below the diagonal.

*
p<.05 and

**
p<.0001.

Table 2

Correlations between social and academic adjustment in the fall and spring.

Academic Adjustment Area:	Time 1		Time 2	
	Social Acceptance	Aggression	Social Acceptance	Aggression
1. Absenteeism	-.12[**]	.15[**]	-.02	.07*
2. Math GPA	.42[**]	-.31[**]	.42[**]	-.35[**]
3. Reading GPA	.43[**]	-.34[**]	.39[**]	-.36[**]
4. Classroom Disruption	-.57[**]	.69[**]	-.56[**]	.72[**]
5. Help-seeking	-.49[**]	.35[**]	-.44[**]	.36[**]
6. Academic Self-esteem	.16[**]	-.07*	.20[**]	-.09*

Note.

[**] $p<.0001$.

Table 3

Significant ANCOVA effects for social adjustment predicting academic adjustment by gender

Academic Adjustment:	Gender	Covariate R²	Social Effect	F-value	Beta	Add'l R²	Total R²
Absenteeism	Males	46%	Agg T2	16.20***	.13	2%	48%
	Females	33%	SocAcc T1	9.15**	-.04	3%	36%
			Agg T2	6.61*	.15		
Math GPA	Males	63%	SocAcc T1	5.12*	.04	3%	66%
			SocAcc T2	27.84***	.13		
			Agg T2	10.16**	-.13		
	Females	64%	SocAcc T1	14.97***	.10	4%	68%
			SocAcc T2	36.01***	.20		
			Agg T1	5.41*	-.12		
			Agg T2	6.23*	-.19		
Reading GPA	Males	64%	SocAcc T2	5.87*	.06	3%	67%
			Agg T1	4.87*	-.07		
			Agg T2	13.95**	-.16		
	Females	70%	SocAcc T1	3.99*	.06	2%	72%
			SocAcc T2	12.95**	.10		
			Agg T1	7.83**	-.12		
Classroom Disruption	Males	64%	SocAcc T1	26.83***	-.13	12%	76%
			SocAcc T2	65.64***	-.18		
			Agg T2	165.92***	.42		
	Females	73%	SocAcc T1	4.49*	-.06	8%	81%
			SocAcc T2	81.67***	-.14		

Academic Adjustment:	Gender	Covariate R^2	Social Effect	F-value	Beta	Add'l R^2	Total R^2
			Agg T2	150.19***	.38		
			AggT1 * AggT2	8.35**	--		
Help-seeking	Males	58%	Soc Acc T1	4.83*	-.06	4%	62%
			SocAcc T2	14.54**	-.12		
			Agg T1	6.51*	.10		
			Agg T2	12.73**	.19		
	Females	56%	SocAcc T1	12.35**	-.11	2%	58%
			SocAcc T2	8.38**	-.12		
Academic Self-esteem	Males	23%	SocAcc T1	6.53*	.05	4%	27%
			SocAcc T2	17.19***	.10		
	Females	16%	SocAcc T1	10.09**	.06	3%	19%
			Agg T1	3.97*	-.12		

Note.

*
$p<.05$,

**
$p<.01$,

***
$p<.0001$.